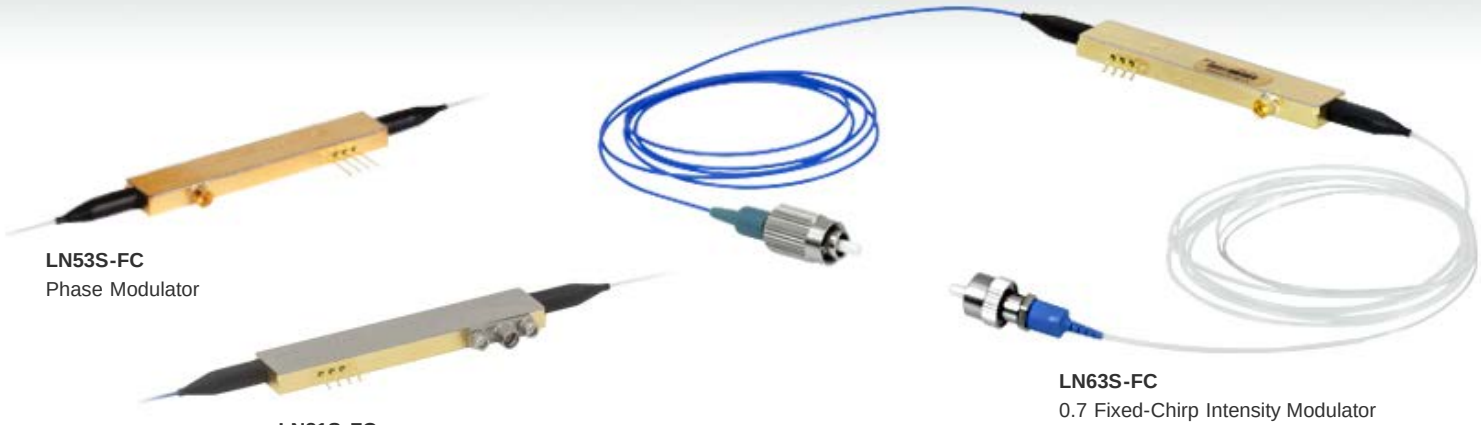
56 Sparta Avenue • Newton, New Jersey 07860
(973) 300-3000 Sales • (973) 300-3600 Fax
www.thorlabs.com

LN63S-FC - April 10, 2015

Item # LN63S-FC was discontinued on April 10, 2015. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

LITHIUM NIOBATE MODULATORS

- **10 GHz Intensity Modulators, X- and Z-Cut $LiNbO_3$**
- **10 GHz Phase Modulators, Z-Cut $LiNbO_3$**



LN53S-FC
Phase Modulator

LN81S-FC
Zero-Chirp Intensity Modulator

LN63S-FC
0.7 Fixed-Chirp Intensity Modulator

Hide 0.7 Fixed Chirp Intensity Modulators

0.7 Fixed Chirp Intensity Modulators

Hide Overview

OVERVIEW

Features

- C- and L-Band Operation Range
- 300-Pin MSA Transponder Compatible Footprint
- Titanium Indiffused Z-Cut Lithium Niobate
- Low Drive Voltage
- Long-Term Bias Stability
- Telcordia GR-468 Compliant
- Integrated Photodetector

Parameter	Value
Operating Range[a]	1525 - 1605 nm
PRBS[b] Optical Extinction Ratio	13 dB
Bit Rate Frequency	9.953 Gb/s
Electrooptic Bandwidth (-3 dB)	10 GHz

- See note below.
- Pseudo Random Binary Sequence

The LN63S-FC and LN82S-FC are 0.7 fixed-chirp $LiNbO_3$ intensity modulators that are designed to be integrated into 300 pin MSA compatible transponders. They feature integrated photodiodes. Fixed-Chirp modulators are fabricated from Titanium Indiffused Z-Cut $LiNbO_3$, which creates in an inequality in the push-pull phase shift between the two arms of the Mach-Zehnder interferometer. This results in a phase/frequency shift (chirp) in the output in addition to the intensity modulation. These fixed chirp modulators down-chirp the pulse, which can be useful when the optical fiber in the network has a positive dispersion coefficient. The down-chirped pulse traveling through an optical fiber with a positive dispersion coefficient will be compressed until a minimum is reached. Beyond that point the dispersion term will dominate. Since chirping the pulse increases the spectral width of the pulse, the chirped pulse will eventually be broader than an unchirped pulse traveling through the same optical fiber. These fixed chirp intensity modulators are ideal for applications requiring improved power penalty (less than two dB for +1600 ps/nm) performance over zero-chirp devices. The integrated photodetector can be used for optical power monitoring and modulator bias control, which eliminates the need for an external fiber

tap.

The 0.7 fixed-chirp Z-Cut $LiNbO_3$ intensity modulators are 10 GHz devices with a PM input fiber pigtail and an SM output pigtail. Both are FC/PC-terminated. The PM fiber is slow-axis aligned. The RF input on the LN82S-FC has a field-replaceable GPO connector, which is considered physically compatible with SMP. For adapting to an SMA connector type, we recommend either a short SMP to SMA cable or a GPO to K adapter, both of which we have available for purchase upon request. Please be advised that because of the compact modulator package, the modulator may not sit flat on a table after attaching a GPO to K adapter, but will sit flat when using the SMP to SMA cable. These specific adapters have been verified to fit the GPO or SMP connector on the package, and have been used in house for testing purposes. Other third party SMP adapters are available from various electronics component suppliers, but the fit may vary and compatibility is not guaranteed. For more information on custom configurations (i.e., fiber type, connectorization, etc.) and quotes, please contact Technical Support.

Note: The modulator is designed for use in the 1550 nm window. Using the modulator at another wavelength (e.g., visible light) may cause a temporary increase in loss that is not covered under warranty. For instance, the increase in loss caused by shorter wavelengths can be reversed by heating the modulator to 50 °C for an hour.

Hide Specs

SPECS

Parameter	Min	Typical	Max	Parameter	Min	Typical	Max
Operating Wavelength[a]	1525 nm	-	1605 nm	**Operating Case Temperature**	0 °C	-	70 °C
DC Optical On/Off Extinction Ratio	20 dB	-	-	**Optical Insertion Loss (Connectorized)**	-	4.0 dB	5.0 dB
PRBS[b] Optical Extinction Ratio	13 dB	-	-	**EOL[d] Insertion Loss Variation**	-0.5 dB	-	0.5 dB
Bit Rate Frequency	9.953 Gb/s	-	-	**Modulator Chirp Parameter**	0.6	-	0.8
E/O Bandwidth (-3 dB)	10 GHz	-	-	**Optical Return Loss**	40 dB	-	-
S11 (DC to 10 GHz)	-	-12 dB	-10 dB	**PD Responsivity**	0.1 mA/mW	-	0.5 mA/mW
RF Drive Voltage (PRBS)	-	5.5 V	6 V	**Output Optical Power Monitoring Range**	-5 dBm	-	10 dBm
V_π Bias Port[c]	-	3 V	8 V	**Output Monitor Variation**	-0.5 dB	-	0.5 dB
EOL[d] DC Bias Voltage Range	-8 V	-	8 V	**Monitor Photodiode Reverse Bias Voltage**	-5.5 V	-	-3.0 V

a. The modulator is designed for use in the 1550 nm window. Using the modulator at another wavelength (e.g., visible light) may cause a temporary increase in loss that is not covered under warranty. For instance, the increase in loss caused by shorter wavelengths can be reversed by heating the modulator to 50 °C for an hour.
b. Pseudo Random Binary Sequence
c. Half-Wave Retardation DC Voltage
d. End of Life

Pin Label (Number)	Description
C (1)	Photodetector Cathode
A (2)	Photodetector Anode
B (3)	Modulator DC Bias
G (4)	Modulator Bias Ground

RF Modulation Input: SMP RF Connector

Part Number	Description	Price	Availability
LN63S-FC	**Fixed-Chirp, 10 GHz Intensity Modulator, Integrated PD, FC/PC**	**$1,500.00**	**Lead Time**
LN82S-FC	**Fixed-Chirp, 10 GHz Intensity Mod., Integrated PD and Replaceable GPO Connector, FC/PC**	**$1,500.00**	**Today**