

## 40 Gbits/s Lithium Niobate Electro-Optic Modulator

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The Lithium Niobate 40 Gbits/s Modulator (2625C) is a higher-speed addition to the Agere Systems' family of modulators that also includes 10 Gbits/s and 20 Gbits/s versions.

### Features

- Ti-diffusion process
- Dual-drive technology
- Thin-film, 50  $\Omega$  termination in package for minimal reflections
- Low modulation voltages
- Tested to *Telcordia Technologies*\* 468
- Angled interfaces for minimal optical reflections
- Hermetic package
- Separate dc bias electrode

### Benefits

- Excellent long-term bias stability over a full operational temperature range of 0 °C to 70 °C
- Adjustable chirp for long distances at high bit rates
- Internal polarizer

### Applications

- Digital high-speed telecommunications:
  - SONET OC-768
  - Undersea communications
- Internet data communications
- SONET test equipment

### Description

Representing the latest advancements in high-speed lithium niobate technology, the 40 Gbits/s electro-optic modulator is designed for long-wavelength, single-mode, external amplitude modulation applications. It uses an integrated Mach-Zehnder configuration to convert single polarization CW light from a semiconductor (DFB) laser into a time-varying optical output signal. Using the source in the CW mode eliminates the need for demanding, high-speed performance from the laser and reduces its cost.

The dual-drive design inherently offers the capability to adjust the phase of the voltages on the electrodes, which produces zero-chirp modulation operation. The modulator is tested to, and meets the intent of, TR-NWT-00468.

\* *Telcordia Technologies* is a trademark of Telcordia Technologies, Inc.

## Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

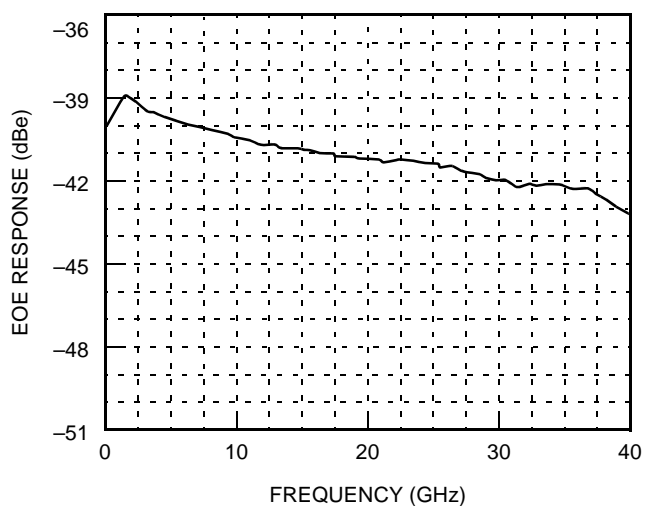
Parameter	Symbol	Min	Max	Unit
Storage Temperature	T <sub>stg</sub>	-40	85	°C
Optical Input Power at 1.5 $\mu$ m	P <sub>IN</sub>	—	30	mW
RF Voltage (peak to peak)	V <sub>RF</sub>	—	10	V
dc Voltage (dc input)	V <sub>dc</sub>	-20	20	V
Operating Temperature	T <sub>OP</sub>	0	70	°C

## Characteristics

Table 1. Optical/Electrical Characteristics (T<sub>c</sub> = 25 °C)

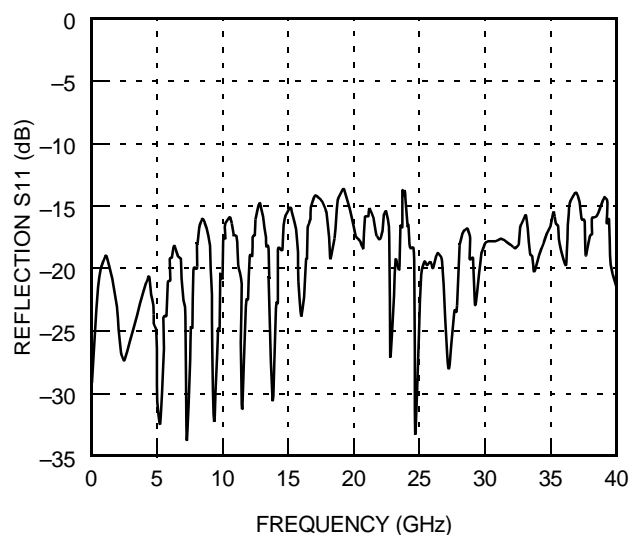
Parameter	Min	Typ	Max	Unit
Operating Wavelength	1525	—	1620	nm
Optical Insertion Loss	—	—	6	dB
Extinction Ratio at dc	20	—	—	dB
Extinction Ratio at RF	13	—	—	dB
S11 Optical Return Loss	—	—	-30	dB
Bandwidth	30	—	—	GHz
Drive Voltage (V $\pi$ ) at 1 GHz	—	—	3	V/side
Electrode Impedance	—	47	—	$\Omega$
S11 Electrical Return Loss	—	—	-10	dB

## 2625C Characteristic Curves



1-1961 (F)

Figure 1. Magnitude of Electro-Optic Response

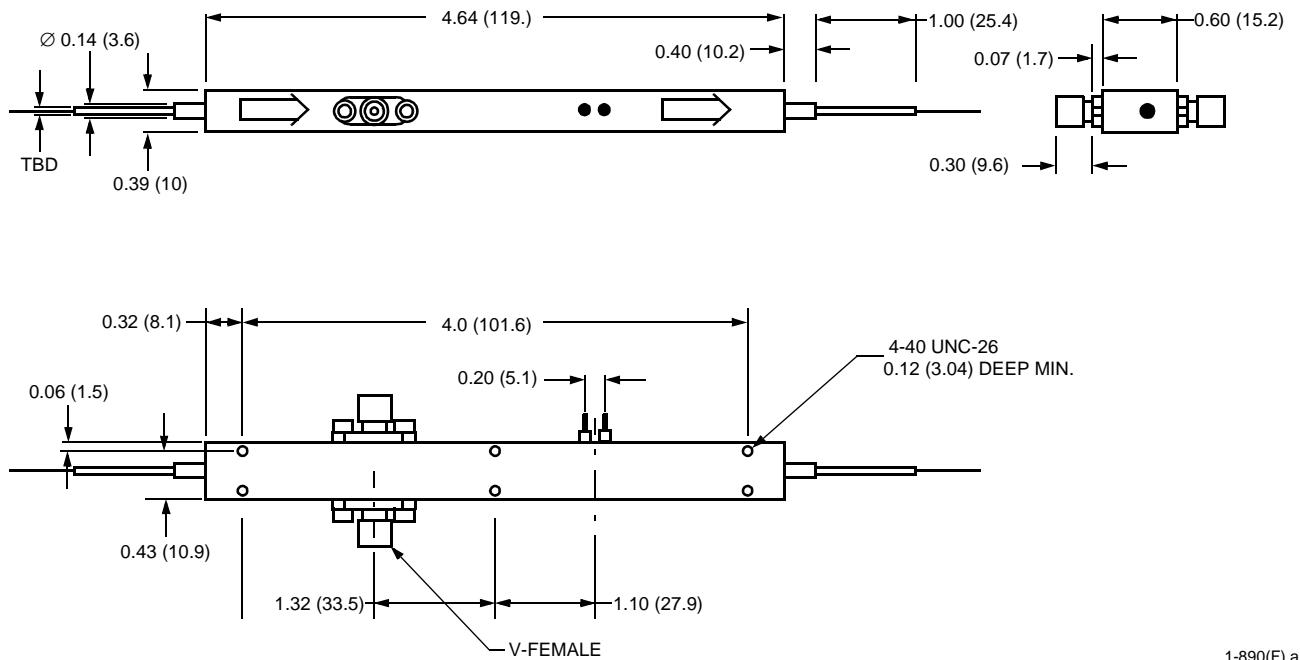


1-1962 (F)

Figure 2. S11 Electrical Return Loss

## Outline Diagram

Dimensions are in inches and (millimeters).



1-890(F).a

## Package Information

Designed to NEBS (inside plant) standards, the hermetic package design incorporates a laser-sealed lid and soldered fibers. The minimum bend radius for the fiber is 1.5 in.

**Table 3. Package Information**

Description	Type
Input Optical Fiber	PANDA-type PMF
Output Optical Fiber	PANDA-type PMF
Fiber Connectors	FC
Fiber Length	1.5 m max
RF Connector	V-type
Package Dimensions	See Outline Diagram, page 3

## Ordering Information

**Table 4. Device Information**

Part Number	Comcode
2625C	109036483

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