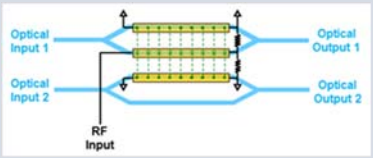
PRELIMINARY

PHOTONICSystems, Inc.®
We Light the Way®

PSI-2700-MOD-R1
Linearizable Modulator



Features

- Linearizable modulator
- DC-20GHz linearization bandwidth

Applications

- High-performance RF links
- Antenna remoting
- ELINT/EW
- Instrumentation

PHOTONIC SYSTEMS INC.
900 Middlesex Turnpike
Building 5
Billerica, MA 01821 USA
P: 1-978-670-4990
F: 1-978-670-2510
E: psi.sales@photonicsinc.com
www.photonicsinc.com

Description

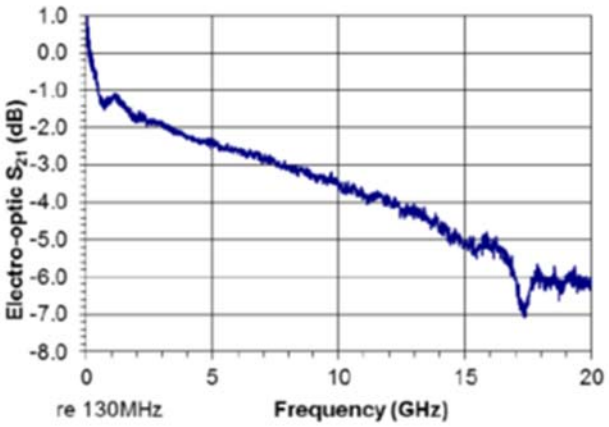
The PSI-2700-MOD patented device consists of two Ti-indiffused lithium niobate Mach-Zehnder modulators (MZs) that share a common RF electrode. Modulator 1 has the typical electrode configuration, with the RF electrode over one waveguide and one ground electrode over the other waveguide. Modulator 2 has only the other ground providing modulation, so it will have a higher V_{pi}. When used in a link with external components, the device produces a broadband linearized link. The single RF electrode means that the effective modulation ratio between the two modulators is independent of frequency. This enables linearized operation over the entire 20-GHz bandwidth of the modulator simultaneously. A dynamic range of 124 dB-Hz$^{4/5}$ has been demonstrated using this modulator. Please contact psi.sales@photonicsinc.com with your application needs.

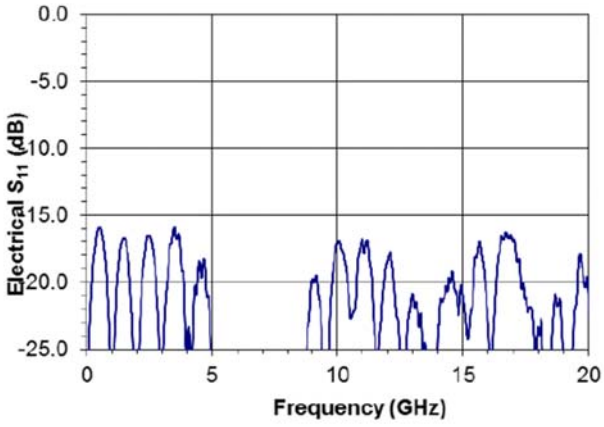
Performance Summary

Parameter	Min	Typ	Max	Units
Optical				
Operating Wavelength	1525		1605	nm
Optical Input Power***			1000	mW
Optical Insertion Loss		6	8*	dB
Optical Return Loss	40			dB
Extinction Ratio	20			dB
Electrical				
MZ1 V_{pi} at DC		2.1	2.5*	V
MZ2 V_{pi} at DC		21	26*	V
MZ1 V_{pi} @ 1 GHz		2.6	3.1*	V
MZ2 V_{pi} @ 1 GHz		28*	35*	V
S11@ <20GHz		<-14	-10*	dB
CW RF Input power*		100	500*	mW
DC voltage on any electrode			50*	V
Mechanical				
RF connectors	3.5mm			
Input Fibers	Polarization Maintaining			
Output fibers	Single Mode			
Fiber connectors	FC/APC (slow-axis aligned if PM)			
Operating Temperature*	0		70	C
Storage Temperature*	-40		85	C

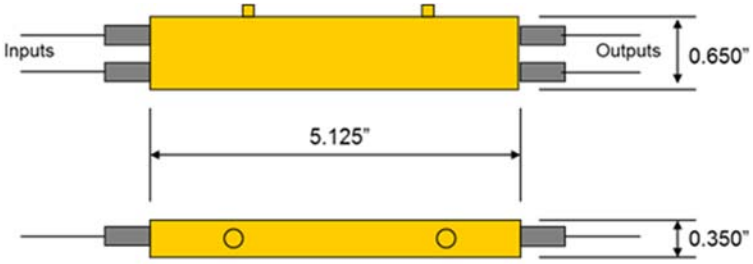
*Note: Preliminary test data or based on similar devices

Example Response

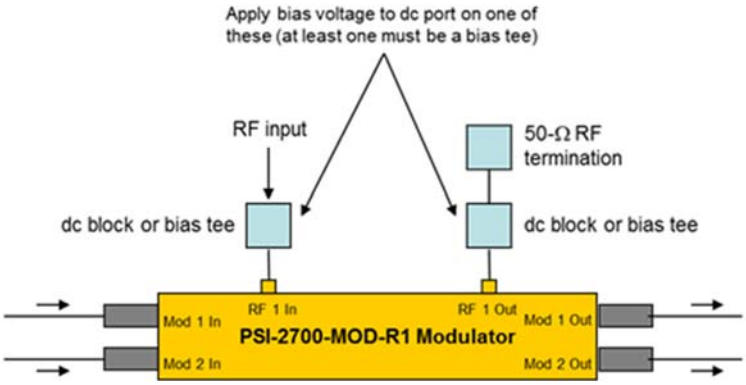




Mechanical Dimensions

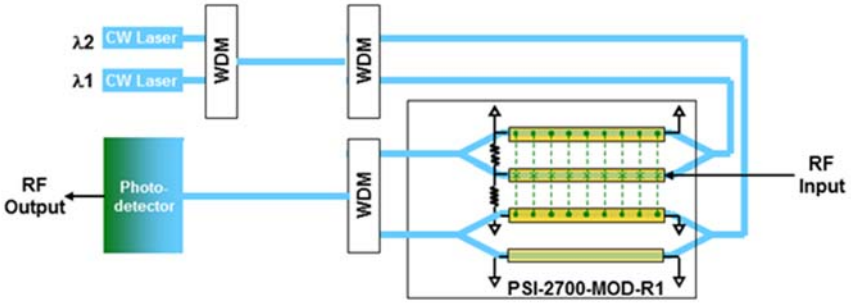


RF Drive Example



Linearized Link Configuration

This figure shows a linearized link configuration using this modulator. Two wavelengths are used, one for each Mach-Zehnder. The bias point (bias T, not shown, required on RF input) should be adjusted so the polarity of the signals from the two modulators are opposite. Both modulators, but most critically modulator 2, should be near quadrature to suppress second-order distortion. The wavelength going through modulator 2, the one with the higher V_{pi}, should have the higher optical power. The wavelength going through modulator 1 should have its power reduced until the third-order intermodulation is suppressed.



Availability

The PSI-2700-MOD-R1 is available in limited quantities. Please contact PSI at psi.sales@photonicsinc.com to discuss availability.