

1550 nm, 20 GHz Compact Intensity Modulator

The Optilab IMC-1550-20 Intensity Modulator is designed for TDM and WDM up to 25 Gb/s transmission, and can also be incorporated for analog modulation of up to 20 GHz for satellite links, antenna remoting, and RF over Fiber. It is a hands-on bias-stabilized lithium modulator with excellent stability in a biased circuit, operating from 1530 nm to 1610 nm. It has an operating temperature tolerance ranging from -30 °C to +60 °C, and superior insertion loss provides for its maximum transmission power. The IMC-1550-20 uses a Polarization Maintaining (PM) input and Single Mode (SM) output fiber, and features separate RF and bias ports. Contact Optilab for more information.

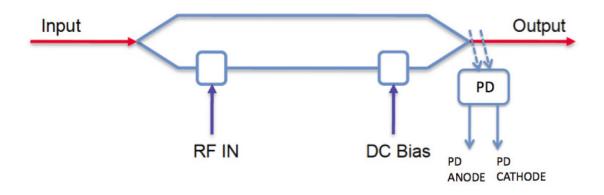
Features

- > Excellent stability in a biased circuit
- ➤ 1530 nm to 1610 nm operating wavelength
- ➤ Low insertion loss
- ➤ Useful bandwidth up to 20 GHz
- ➤ Wide operating temp. range of -30 °C to +60 °C Extended range available

Applications

- ➤ TDM and WDM up to 25 Gb/s
- ➤ Analog Transmission up to 20 GHz
- ➤ Satellite Link
- ➤ Antenna Remote
- ➤ RF over Fiber

Functional Diagram



1550 nm, 20 GHz Compact Intensity Modulator

OPTIONS

IMC-1550-20-XX

XX TQ: Temperature Qualified

TECHNICAL INFO

For technical info and support:

sales@optilab.com

www.optilab.com

WEB ORDER

To order, please visit OEQuest.com.



Optilab Advantage

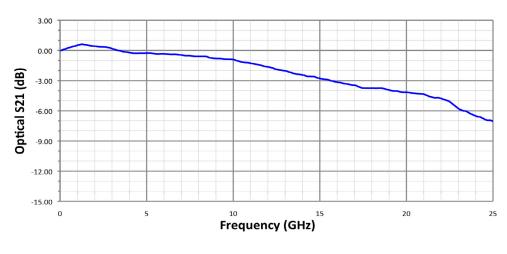
- ➤ Innovation
- ➤ Performance
- ➤ Quality
- ➤ Customization
- ➤ Warranty

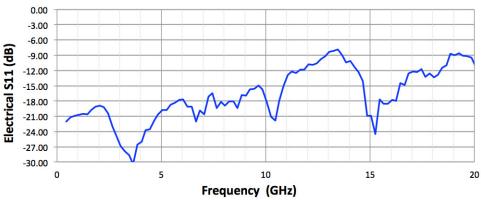
Input optical power Operating wavelength Chirp Value 4± 0.2 (zero chirp design) Insertion Loss Extinction Ratio Optical return loss 52 5 dB min. Optical return loss 5- 45 dB S21 Bandwidth Chirp Value 20 GHz typ.; 15 GHz min. 511 Return Loss 5- 10 dB @ 10 GHz Vπ (RF Port) 6.7 V typ. @ 10 GHz RF Input power Impedance (RF Port) 50 Ω typ. Vπ (Bias Port) Analog Link Performance IIP3 @ 7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (TQ version) Operating Humidity Omerating Temperature -60 ° C to +90 ° C Operating Humidity Ometonector PM FC/APC, PM FC/UPC Material Linbo3 Crystal Orientation V= 00 μm tubing Dimensions 2.56"x 0.45" x 0.19"		
Operating wavelength Chirp Value Chirp Value Chirp Value Chirp Value Chirp Value Chirp Value Chirp	General Specifications	
Chirp Value<± 0.2 (zero chirp design)Insertion Loss4.0 dB typ.; 4.5 dB max.Extinction Ratio≥ 25 dB min.Optical return loss\$- 45 dB\$21 Bandwidth20 GHz typ.; 15 GHz min.\$11 Return Loss\$- 10 dB @ 10 GHz\$\scalebar{\text{M}} \text{ (RF Port)}\$6.7 V typ. @ 10 GHz\$RF Input power27 dBm max.Impedance (RF Port)\$0 \text{ Ω typ.}\$\$\scalebar{\text{M}} \text{ (Bias Port)}\$\$< 5 V @ DC	Input optical power	100 mW max.available
Insertion Loss Extinction Ratio Dytical return loss \$\(\) = 25 dB min. \(\) \(Operating wavelength	1530 to 1610 nm
Extinction Ratio ≥ 25 dB min. Optical return loss	Chirp Value	<± 0.2 (zero chirp design)
Optical return loss ≤ - 45 dB S21 Bandwidth 20 GHz typ.; 15 GHz min. S11 Return Loss ≤ -10 dB @ 10 GHz Vπ (RF Port) 6.7 V typ. @ 10 GHz RF Input power 27 dBm max. Impedance (RF Port) 50 Ω typ. Vπ (Bias Port) < 5 V @ DC	Insertion Loss	4.0 dB typ. ; 4.5 dB max.
S21 Bandwidth S11 Return Loss \$ −10 dB @ 10 GHz \(\pi \) (RF Port) \$ 6.7 V typ. @ 10 GHz RF Input power \$ 27 dBm max. Impedance (RF Port) \$ 50 Ω typ. \(\pi \) (Bias Port) \$ 7 dBias Port) \$ 20 mA/W min., 30 mA/W typ. Analog Link Performance \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 1 dB Conpression Point @10 GHz \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 1 dB Conpression Point @10 GHz \$ 2 dB m \$ 3 dB C C C C C C C C C C C C C C C C C C	Extinction Ratio	≥ 25 dB min.
S11 Return Loss S = -10 dB @ 10 GHz Vπ (RF Port) RF Input power RF Input power 27 dBm max. Impedance (RF Port) 50 Ω typ. Vπ (Bias Port) PD Responsivity 20 mA/W min., 30 mA/W typ. Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) 50 °C to +50 °C Storing Temperature -60 °C to +90 °C Operating Humidity O'k to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type Input Connector PM FC/APC, PM FC/UPC Output Connector PM FC/APC, PM FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Bias Port Connectors GPO Cabling 900 μm tubing	Optical return loss	≤- 45 dB
Vπ (RF Port) RF Input power RF Input power 27 dBm max. Impedance (RF Port) 50 Ω typ. Vπ (Bias Port) PD Responsivity 20 mA/W min., 30 mA/W typ. Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) Storing Temperature -60 °C to +90 °C Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Bias Port Connector RF Port connectors GPO Cabling 900 μm tubing	S21 Bandwidth	20 GHz typ. ; 15 GHz min.
RF Input power Impedance (RF Port) Vπ (Bias Port) PD Responsivity Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature -55 °C to +75 °C Storing Temperature Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Material Crystal Orientation Waveguide Process Bias Port Connectors GPO Cabling PO MAL A V (Bm max. 27 dBm max. 10 d Styp. 50 Ω typ. 60 °C 60 Ω typ. 6	S11 Return Loss	≤ -10 dB @ 10 GHz
Impedance (RF Port) Vπ (Bias Port) Vπ (Bias Port) PD Responsivity Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) Storing Temperature -60 °C to +90 °C Operating Humidity O''s to 90% Relative Humidity Input Fiber Type Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Material LiNbO3 Crystal Orientation Waveguide Process Bias Port Connectors GPO Cabling SO M typ. 50 N D HB 61 N D S N D	Vπ (RF Port)	6.7 V typ. @ 10 GHz
Vπ (Bias Port) < 5 V @ DC PD Responsivity 20 mA/W min., 30 mA/W typ. Analog Link Performance IIP3 @7 GHz 29 dBm 1 dB Conpression Point @10 GHz 14.5 dBm typ. Mechanical Specifications Operating Temperature (standard) -30 °C to +60 °C Operating Temperature (TQ version) -55 °C to +75 °C Storing Temperature -60 °C to +90 °C Operating Humidity 0% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connectors GPO Cabling 900 μm tubing	RF Input power	27 dBm max.
PD Responsivity Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) Storing Temperature -60 °C to +90 °C Operating Humidity Input Fiber Type Output Fiber Type Input Connector Output Connector Material Crystal Orientation Waveguide Process Bias Port Connectors Cabling PO dBm 14.5 dBm typ. 29 dBm 14.5 dBm typ. 15. dChelling typ. 14.5 dBm typ. 15. dChelling typ. 16. dChelling typ.	Impedance (RF Port)	50 Ω typ.
Analog Link Performance IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) Storing Temperature -60 °C to +90 °C Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type Input Connector Other Connector Material Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors GPO Cabling 29 dBm 29 dBm 14.5 dBm typ. 15. C to +60 °C PO PAND PO C Cabling 15. GPO 16. Cabling	Vπ (Bias Port)	< 5 V @ DC
IIP3 @7 GHz 1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) Operating Temperature (TQ version) Storing Temperature -60 °C to +90 °C Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector Material LiNbO3 Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors GPO Cabling 900 µm tubing	PD Responsivity	20 mA/W min., 30 mA/W typ.
1 dB Conpression Point @10 GHz Mechanical Specifications Operating Temperature (standard) -30 °C to +60 °C Operating Temperature (TQ version) -55 °C to +75 °C Storing Temperature -60 °C to +90 °C Operating Humidity 0% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connector 2 Pin electrode RF Port connectors GPO Cabling 900 µm tubing	Analog Link Performance	
Mechanical Specifications Operating Temperature (standard) -30 °C to +60 °C Operating Temperature (TQ version) -55 °C to +75 °C Storing Temperature -60 °C to +90 °C Operating Humidity 0% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connector 2 Pin electrode RF Port connectors GPO Cabling 900 µm tubing	IIP3 @7 GHz	29 dBm
Operating Temperature (standard) Operating Temperature (TQ version) -55 °C to +75 °C Storing Temperature -60 °C to +90 °C Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connector QPO Cabling 900 µm tubing	1 dB Conpression Point @10 GHz	14.5 dBm typ.
Operating Temperature (TQ version) -55 °C to +75 °C Storing Temperature -60 °C to +90 °C Operating Humidity 0% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type SMF-28e Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connector 2 Pin electrode RF Port connectors GPO Cabling 900 µm tubing	Mechanical Specifications	
Storing Temperature Operating Humidity O% to 90% Relative Humidity Input Fiber Type PANDA - PM Output Fiber Type Input Connector Output Connector Material Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors Cabling Comparison of the policy of	Operating Temperature (standard)	-30 °C to +60 °C
Operating Humidity Input Fiber Type Output Fiber Type SMF-28e Input Connector Output Connector FC/APC, PM FC/UPC Material Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors Cabling O% to 90% Relative Humidity PANDA - PM SMF-28e Input Connector FC/APC, PM FC/UPC LiNbO3 X-cut, y-propagating Ti-indiffused 2 Pin electrode RF Port connectors GPO Cabling	Operating Temperature (TQ version)	-55 °C to +75 °C
Input Fiber Type Output Fiber Type Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation Waveguide Process Ti-indiffused Bias Port Connector RF Port connectors GPO Cabling PANDA - PM SMF-28e PM FC/APC, PM FC/UPC FC/APC, FC/UP	Storing Temperature	-60 °C to +90 °C
Output Fiber Type Input Connector PM FC/APC, PM FC/UPC Output Connector FC/APC, FC/UPC Material LiNbO3 Crystal Orientation Waveguide Process Ti-indiffused Bias Port Connector RF Port connectors GPO Cabling 900 µm tubing	Operating Humidity	0% to 90% Relative Humidity
Input Connector Output Connector FC/APC, FC/UPC Material Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors Cabling PM FC/APC, PM FC/UPC LiNbO3 X-cut, y-propagating Ti-indiffused 2 Pin electrode GPO GPO 900 µm tubing	Input Fiber Type	PANDA - PM
Output Connector Material Crystal Orientation Waveguide Process Bias Port Connector RF Port connectors Cabling FC/APC, FC/UPC LiNbO3 X-cut, y-propagating Ti-indiffused 2 Pin electrode GPO Cabling 900 µm tubing	Output Fiber Type	SMF-28e
MaterialLiNbO3Crystal OrientationX-cut, y-propagatingWaveguide ProcessTi-indiffusedBias Port Connector2 Pin electrodeRF Port connectorsGPOCabling900 μm tubing	Input Connector	PM FC/APC, PM FC/UPC
Crystal Orientation X-cut, y-propagating Waveguide Process Ti-indiffused Bias Port Connector 2 Pin electrode RF Port connectors GPO Cabling 900 µm tubing	Output Connector	FC/APC, FC/UPC
Waveguide Process Bias Port Connector RF Port connectors Cabling Ti-indiffused 2 Pin electrode GPO 900 µm tubing	Material	LiNbO3
Bias Port Connector 2 Pin electrode RF Port connectors GPO Cabling 900 µm tubing	Crystal Orientation	X-cut, y-propagating
RF Port connectors GPO Cabling 900 µm tubing	Waveguide Process	Ti-indiffused
Cabling 900 µm tubing	Bias Port Connector	2 Pin electrode
	RF Port connectors	GPO
Dimensions 2.56"x 0.45" x 0.19"	Cabling	900 µm tubing
	Dimensions	2.56"x 0.45" x 0.19"



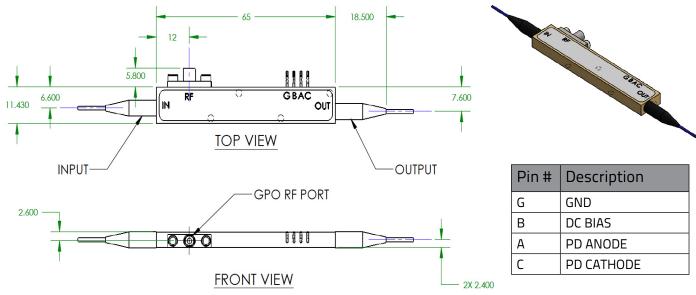
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Typical S21 and S11 Bandwidth





Mechanical Drawing



^{*} Dimension unit: mm

