



# IM-1550-40-ST

## DEVICE

# 40 GHz 1550 nm Intensity Modulator – Space Tested

## OVERVIEW

The Optilab IM-1550-40-ST Intensity Modulator is designed for analog modulation of up to 40 GHz for microwave links, antenna remoting, and RF over fiber. It has also been tested with qualification standards such as MIL-STD-883 and ESCC 22900 for space applications

## FEATURES

- 30+ GHz Bandwidth
- Excellent bias stability
- Low Insertion loss of 3 dB
- 1525 nm to 1620 nm
- Zero chirp design
- Polarization Maintaining

## USE IN

- 40 GHz RF over Fiber (RFoF)
- Fiber optic gyroscopes
- High frequency fiber optic links
- Inter-satellite communications
- Instrument for scientific missions
- Microwave photonics sub-systems

## TESTS

- Thermal Cycling
- Random Vibration
- Electro-Optical Measurement
- Radiographic Inspection
- Fine Leak Seal Tests
- Gross Leak Seal Tests
- Total Ionizing Dose
- Proton Displacement Damage

## STANDARDS

- ESCC 22900
- MIL-STD-883





# IM-1550-40-ST

## SPECIFICATIONS

Input Optical Power	100 mW max
Operating Wavelength	1525 nm to 1610 nm
Chirp Value	$\leq \pm 0.2$
Insertion Loss	4 dB typical, 4.5 dB max
Extinction Ratio	$\geq 25$ dB
Optical Return Loss	$\leq -45$ dB
$S_{21}$ Bandwidth (RF Port)	30 GHz typical @ -3 dB
$S_{11}$ Return Loss (RF Port)	$\leq -8$ dB @ 30 GHz
$V_{\pi}$ (RF Port)	4.5 V typical @ 30 GHz
RF Input Power	27 dBm max
Impedance (RF Port)	50 $\Omega$ typical
$S_{21}$ Bandwidth (Bias Port)	500 MHz typ.
$V_{\pi}$ (Bias Port)	$\leq 2$ V @ 1 kHz
Impedance (Bias Port)	$> 1$ M $\Omega$
PD Responsivity	40 - 100 mA/W typical

## GENERAL

## MECHANICAL

Operating Temperature	-55°C to +75°C
Storage Temperature	-60 °C to +90 °C
Operating Humidity	0% to 90% Relative Humidity
Input Fiber	Panda - PM 1550
Output Fiber Type	Panda - PM 1550
Input Connector	PM FC/APC; request for others
Output Connector	PM FC/APC; request for others
Bias Port Connector	2 Pins (Pin 1 & 2)
Tap PD Connector	2 Pins (Pin 3 & 4)
RF Port Connectors	V Connector
Cabling	900 $\mu$ m tubing
Dimension	72x16x7mm





# IM-1550-40-ST

## RADIATION

### Total Ionizing Dose

Source	Co-60 Gamma ray
Dose Rate	36 Gy/hr
Total Dose	1000 Gy

### Proton Displacement Damage

Proton Energy	34.96±3.82 MeV
Flux	1x10 <sup>8</sup> particles/(s·cm <sup>2</sup> )
Total Fluence	1x10 <sup>11</sup> particles/cm <sup>2</sup>

## THERMAL CYCLE

Range	-55°C to +75°C
Cycles	2
Ramp Speed	1°C/min
Stability Period	10 min

## RANDOM VIBRATION

Power Spectral Density	0.3
Overall rms G	20.0
Test Duration	3min/axis

## SEAL TESTS

### Fine Leak

Source	He tracer gas
Result	No leak

### Gross Leak

Source	Perfluorocarbon gas
Result	No Leak





# IM-1550-40-ST

FUNCTION  
DIAGRAM

