

# 20/40GHz Fiber Optical Transmitter/Converter

(0.01 to 40GHz, analog, auto bias, auto output control)



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The GHTM series of Fiber Optical Transmitters or Electrical-to-Optical Converters generate high-fidelity analog optical signals from electrical inputs, operating over a range from 10 MHz to 20 or 40 GHz. These high-performance, turnkey modules integrate a thin-film low  $V_{\pi}$  lithium niobate modulator, reducing the RF input signal power requirement. The modulator is stabilized by a fully automatic bias controller to maintain optimal performance without drifts caused by environmental temperature changes or prolonged operation. Additionally, the system includes a tunable or fixed-wavelength DFB laser source, a variable optical attenuator, and power monitors for fully automated output power control and stabilization. The tunable laser can scan over the ITU 50 GHz grid with fine tuning of  $\pm 30$  GHz in 1 MHz increments via a USB-connected GUI, while the fixed-wavelength laser is adjustable within a few nm through a manual tuning pot. The module can also integrate an external laser source, making it compatible with polarization-maintaining devices like tunable lasers or narrow-linewidth lasers, providing versatility for OEM system integration. The GHTM operates on a single  $\pm 5$  Volt DC power supply which is provided. The GHTM is designed for RF-over-Fiber applications, as well as testing and characterizing optical-to-electrical (O-E) devices.

## Features

- Up to 40GHz
- Low Drive Voltage
- Wide Temperature Operation
- High Fidelity
- No Drift
- Constant Optical Output
- High Stability

## Applications

- 20/40 GHz RFoF Transmission
- Analog Photonics
- Testing
- Sub-nanosecond Pulse Generation
- Optical Communication to 40Gb/s
- Active Mode Lock
- EF/IF Signal Distribution
- Satellite Communication

## Specifications

Parameter	Min	Typical	Max	Unit
Optical Wavelength	1520		1610	nm
Optical Output Power		3		mW
Optical Input Power			20	dBm
RF Frequency Range	0.01	20	40	GHz
Extinction Ratio		25	30	dB
Modulator $V_{\pi}$		3	6	dBm
RF Input Power			27	dBm
Fiber Type	PM1550 In		SM28 Out	
Fiber Connector Type		SC/APC		
RF Impedance		50		$\Omega$
RF Connector		SMA		
Power Consumption	3			W
Weight	0.5			kg
Operating Temperature	-20		50	$^{\circ}\text{C}$
Storage Temperature	-45		85	$^{\circ}\text{C}$

**Note:** The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

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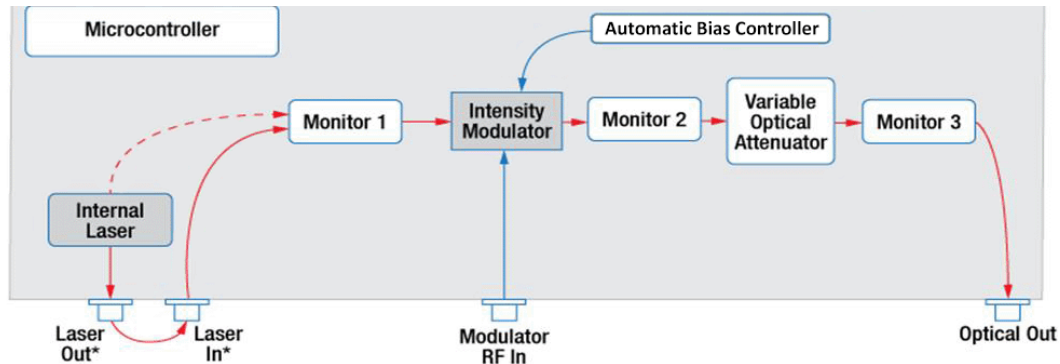
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## Optical Path Diagram



## Electrical/Computer Connection

### Note:

\* Bidirectional means two-way communications via a single fiber link. The price is double since it comprises two pairs of transceivers and receivers with WDM (different wavelength) or circulator (same wavelength) cable jumpers.

Red marked -- Special order

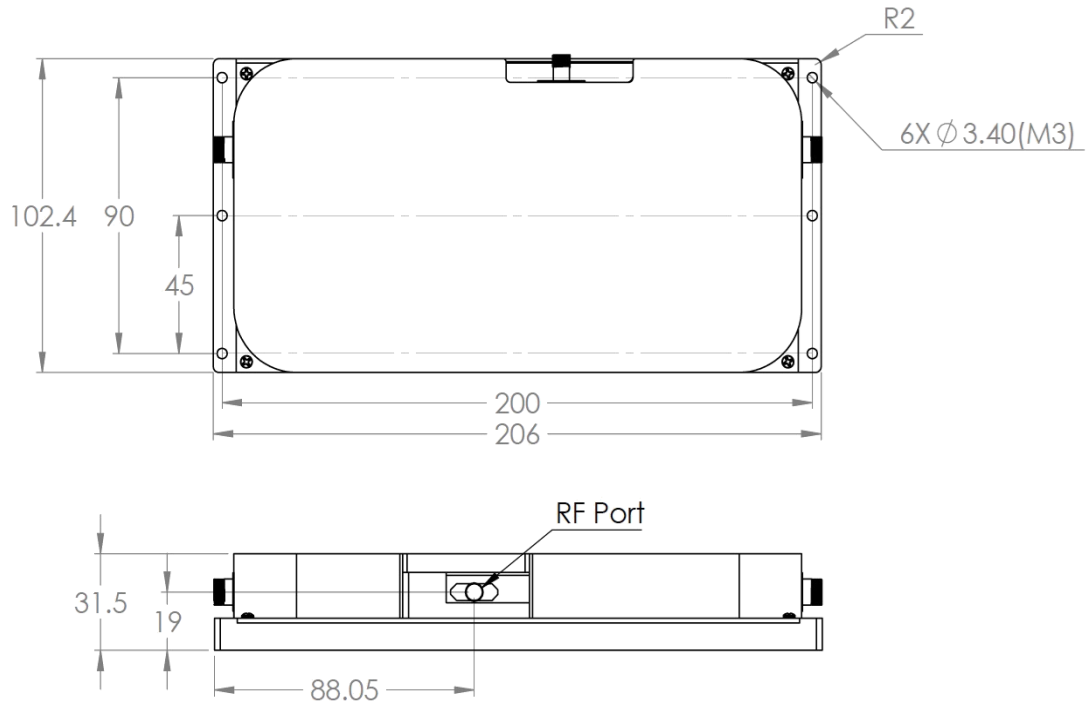
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### Dimensions (Unit: mm)



\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

### Ordering Information

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Prefix	RF Frequency	Laser Wavelength	Tunable Laser	Package	Configuration	Fiber Connector
<b>GHTM-</b>	20GHz = 2 40GHz = 4 <b>60GHz = 6</b>	1551.11 nm = 55111 1562.22 nm = 56222 External Laser = 00000	None = 1 Yes = 2	Module = 1 Rack = 2 Special = 0		FC/APC = 2 Special = 0

**Note:**

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## Application Notes

### Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

### Fiber Cleanliness

Fibers with smaller core diameters (<5  $\mu\text{m}$ ) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

### Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

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## Typical Response

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■ S11

■ S22

■ S21