Data Sheet

MT100-1064-010W

1064nm Optical Power Converter



Description

The MT100-1064-010W converts optical power to electrical power for applications that require complete electrical isolation in highly demanding industrial environments. It is an excellent choice for powering electronic circuitry where electrical wired solutions are not feasible due to high voltage, electromagnetic interference, or strong magnetic fields.

The MT100-1064-010W is based on the GaAs Power Converter. The MT100-1064-010W uses a multi-junction compound semiconductor design. It is a versatile 6V source with superior performance for a wide range of wavelengths and temperatures. It can be used in the spectral range between 1000nm and 1100nm for the standard –40°C to +85°C operating temperature range.

The MT100-1064-010W can supply output voltage levels > 5 VDC for various applications. In typical cases, these devices can provide > 10W of electrical power by converting 30W of optical input power from a high-power laser diode.

The optical power converter shows a nearly linear current response to the optical input power. Smart thermal design simplifies system integration, and with a 6-pin pluggable socket.

The MT100-1064-010W is optimized for integration with efficient coupling of multi-mode (MM) fibers with various numerical apertures (for example, NA ~ 0.22) and with core diameters (for example, 40 µm to 400 µm).

NOTE: MiracleTech reserves the right to make changes without further notice to any products or data herein to improve reliability, function, or design.

Features

- Fully isolated power over fiber (PoF) solution that efficiently converts optical power to electrical power with a ~6V output.
- Qualified for an operating temperature range of –40°C to +85°C.
- The device is configured with an SMA905 optical port for use with MM fibers with an NA ~ 0.22 and for any fiber core diameters (for example, from 40 µm to >400 µm).
- Easy heat-sink mounting for thermal management.
- Ideal output power range for regular-power applications.

Applications

The following are typical fields of application for the optical power converter:

- Sensor applications: Provides isolated power for various sensors.
- Electric power utilities: Provides fully isolated power to protect sensor devices.
- Lightning: Protects key circuits.
- Biomedical and neuro-stimulation: Provides safe and
- tailored voltage and current sources.
- RF power electronic circuits: Reduces interference and ringing.
- Chemical plants: Uses power over fiber in corrosive areas where metal wires can be attacked.
- Avionics: Uses power over fiber instead of metal wires to reduce weight and EMI and to eliminate the risk of fire from sparks.
- Security: Triggers and powers sources unaffected by EMI-RFI.

Mechanical Dimensions – SMA905 Port

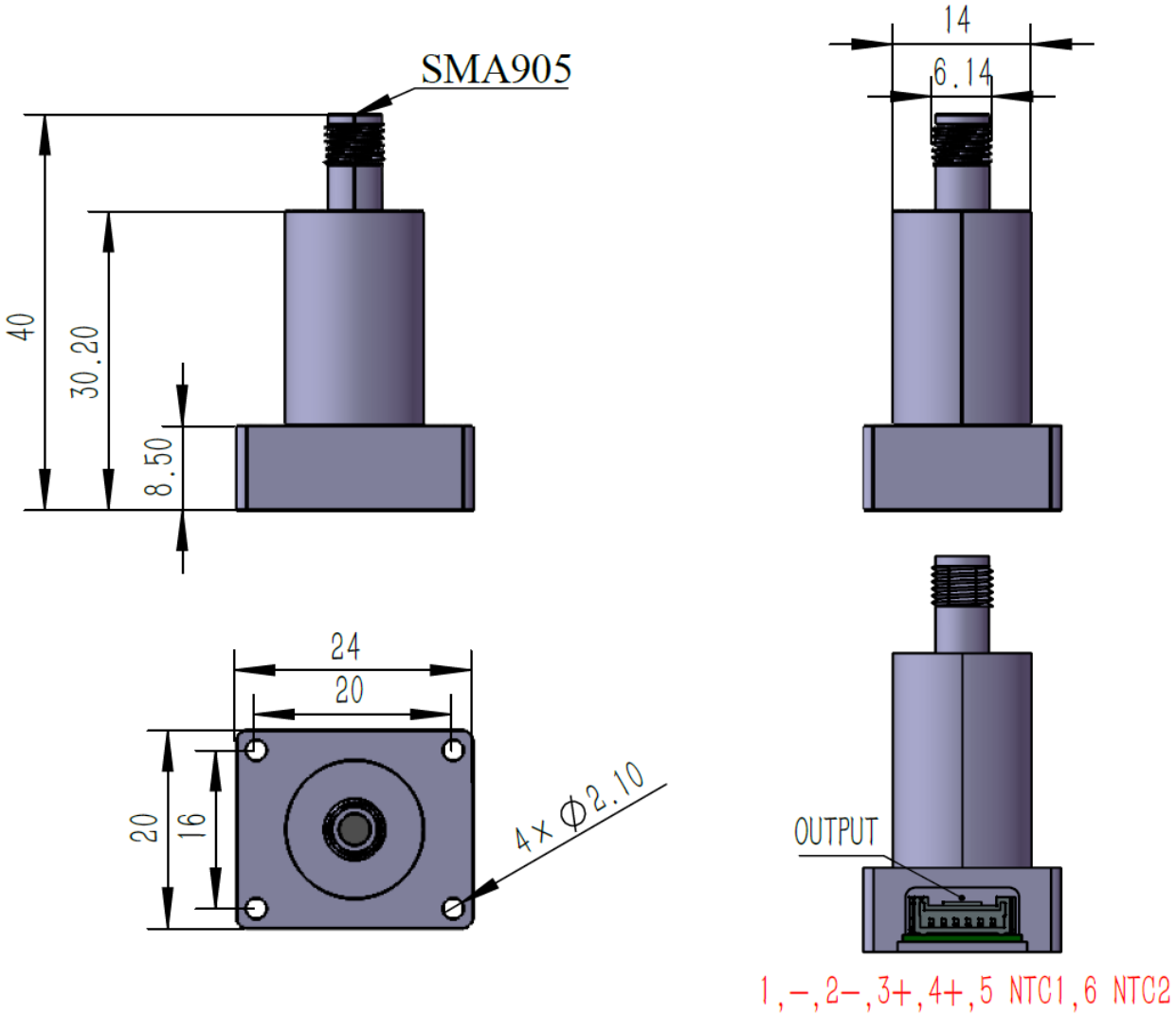


Figure 1: MT100-1064-010W

NOTE: Dimensions are in mm.
NOTE: Designed for bottom heat sinking.
NOTE: The output Header is **Molex 505567-0671** and the matching plug is **Molex 505565-0601**.

Absolute Maximum Ratings

Absolute maximum ratings are those values beyond which damage to the device can occur if these limits are exceeded other than for a short period of time.

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	–40	25	85	°C
Operating Case Temperature	T_C	–40	—	85	°C
Relative Humidity	RH	5	—	85	%
Maximum Optical Input Power [a]	$P_{opt\ IN}$	—	—	30	W

a. Proper heat sinking is required. Lower-performance heat sinking can affect the maximum optical input power value because the operating case temperature can be exceeded at higher powers if the heat-sink design does not properly extract the excess heat.

Fiber Specifications

The input fiber should be protected by a sleeve or ceramic ferrule during handling.

Parameter	Symbol	Min.	Typical	Max.	Unit
Core Diameter	D	—	Typically insignificant impact between 40 µm and 400 µm	—	µm
Numerical Aperture	NA	0.17	0.22	0.22	
Fiber Length	—	—	Application-specific	—	meters

Temperature Sensor

An internal temperature sensor is integrated to monitor the device temperature.

Parameter	Symbol	Min.	Typical	Max.	Unit
NTC, B=3930K	R	—	10	—	kΩ
Temperature Range	T	−40	Application-specific	150	°C

Operating Characteristics

All specified parameters are valid for operations at a case temperature of 25°C.

Parameter	Symbol	Min.	Typical	Max.	Unit
Recommended optical input spectrum range	λ_{IN}	1000	1064	1100	nm
For Optical Power In = 10W					
P_{mpp}	P_{OUT}		4.036		W
Output Voltage at P_{mpp}	V_{OUT}	—	6.596	—	V
Output Current at P_{mpp}	I_{OUT}	—	0.612	—	A
For Optical Power In = 20W					
P_{mpp}	P_{OUT}	—	7.625	—	W
Output Voltage at P_{mpp}	V_{OUT}	—	6.246	—	V
Output Current at P_{mpp}	I_{OUT}		1.221		A
For Optical Power In = 30W					
P_{mpp}	P_{OUT}	—	10.795	—	W
Output Voltage at P_{mpp}	V_{OUT}	—	5.816	—	V
Output Current at P_{mpp}	I_{OUT}		1.856		A

Typical Characteristics

All measurements are performed at 25 °C using a laser wavelength of 1064 nm.

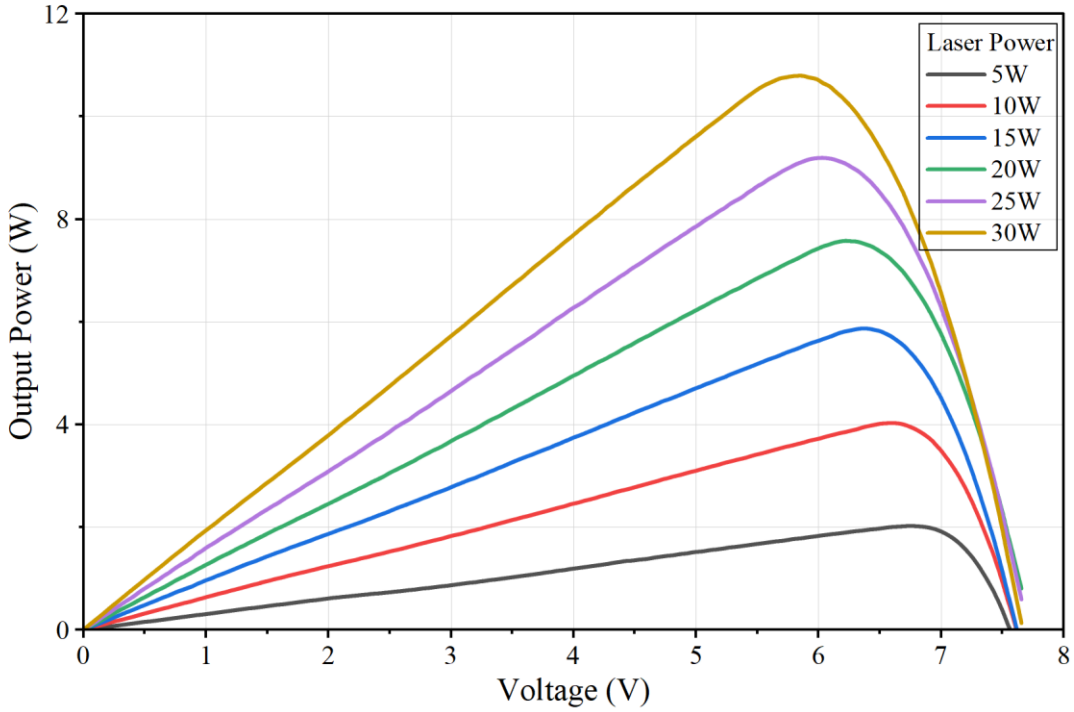


Figure 2: PV curve of MT100-1064-015W

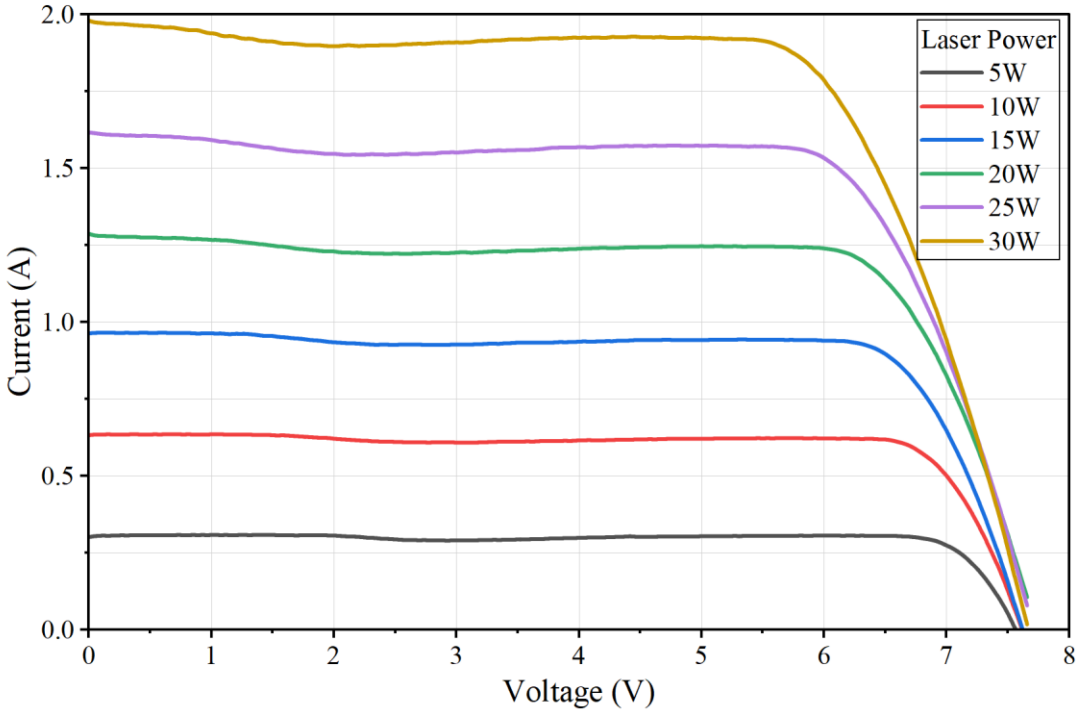


Figure 3: IV curve of MT100-1064-010W