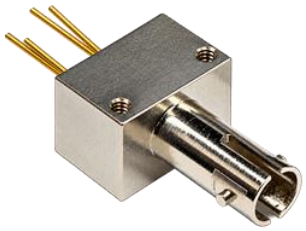
Data Sheet

# MT-LPC-808-003W-ST

# 3W Optical Power Converter



## Description

The MT-LPC-808-003W-ST 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 MT-LPC-808-003W-ST is based on the GaAs Power Converter. The MT-LPC-808-003W-ST uses a multi-junction compound semiconductor design. It is a versatile 5V source with superior performance for a wide range of wavelengths and temperatures. It can be used in the spectral range between 800nm and 840nm for the standard –40°C to +85°C operating temperature range.

The MT-LPC-808-003W-ST can supply output voltage levels > 5V DC for various applications. In typical cases, these devices can provide > 3W of electrical power by converting 5W 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.

The MT-LPC-808-003W-ST 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 ~5V output.
- Qualified for an operating temperature range of –40°C to +85°C.
- The device is configured with an ST 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 – ST Port

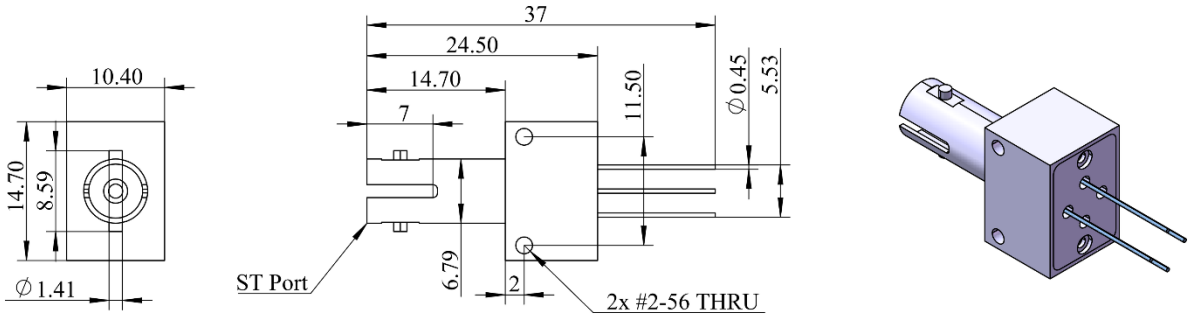



**Figure 1: MT-LPC-808-003W-ST**

**NOTE:** Dimensions are in mm.

# Pin Description

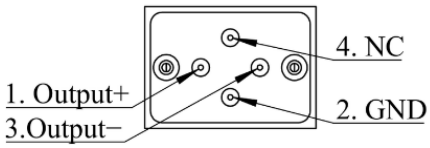



**Figure 2: Pins of MT-LPC-808-003W-ST**

NOTE: Dimensions are in mm. The Output + Pin and Output – Pin indicate the current flow from "+" to "–". The GND pin is connected to the housing. The NC pin has no internal connection.

# 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] | $P_{opt\ IN}$ | — | — | 8 | 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 |

# 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 | $\lambda_{IN}$ | 800 | 808 | 840 | nm |
| **For Optical Power In = 1W** | | | | | |
| $P_{mpp}$ | $P_{OUT}$ | | 0.58 | | W |
| Output Voltage at $P_{mpp}$ | $V_{OUT}$ | — | 6.4 | — | V |
| Output Current at $P_{mpp}$ | $I_{OUT}$ | — | 0.091 | — | A |
| **For Optical Power In = 3W** | | | | | |
| $P_{mpp}$ | $P_{OUT}$ | — | 1.72 | — | W |
| Output Voltage at $P_{mpp}$ | $V_{OUT}$ | — | 6.3 | — | V |
| Output Current at $P_{mpp}$ | $I_{OUT}$ | | 0.273 | | A |
| **For Optical Power In = 5W** | | | | | |
| $P_{mpp}$ | $P_{OUT}$ | — | 2.74 | — | W |
| Output Voltage at $P_{mpp}$ | $V_{OUT}$ | — | 6.1 | — | V |
| Output Current at $P_{mpp}$ | $I_{OUT}$ | | 0.452 | | A |
| **For Optical Power In = 6W** | | | | | |
| $P_{mpp}$ | $P_{OUT}$ | — | 3.21 | — | W |
| Output Voltage at $P_{mpp}$ | $V_{OUT}$ | — | 6.1 | — | V |
| Output Current at $P_{mpp}$ | $I_{OUT}$ | | 0.526 | | A |

# Typical Characteristics

All measurements are performed at 25 °C using a laser wavelength of 808 nm.

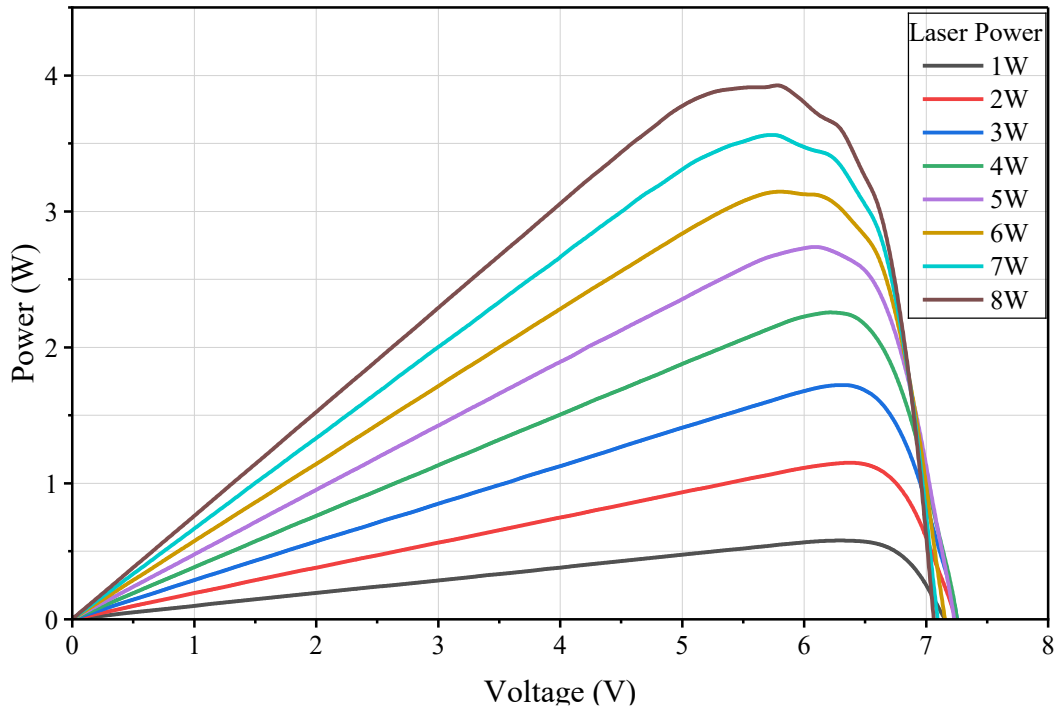



**Figure 3: PV curve of MT-LPC-808-003W-ST**

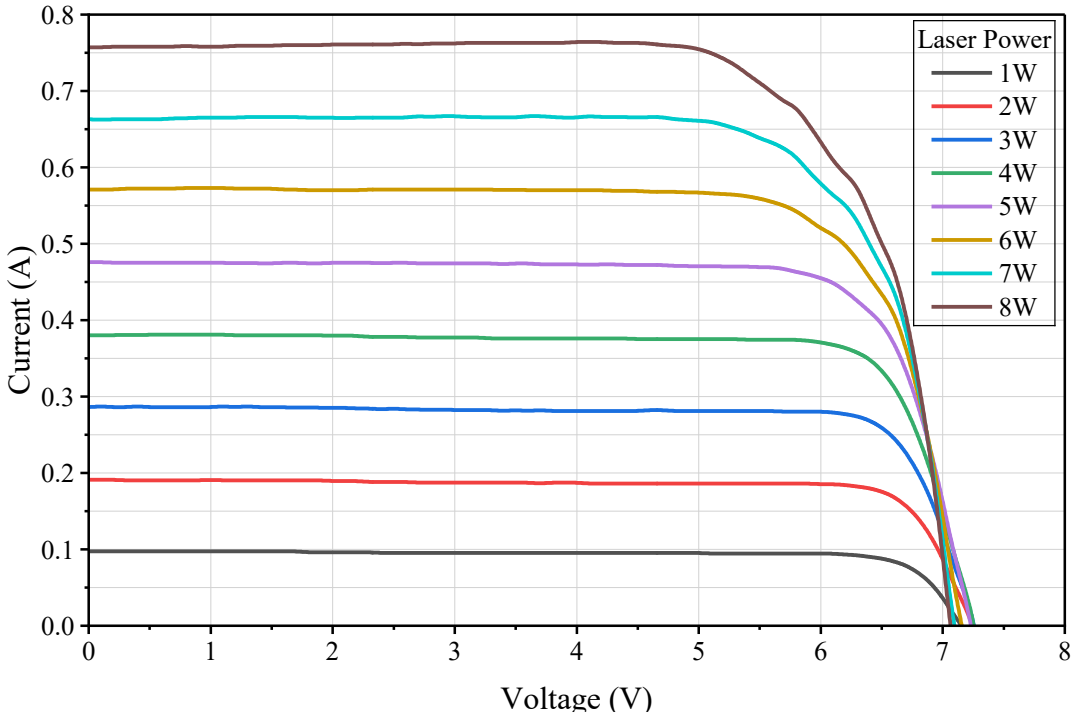



**Figure 4: IV curve of MT-LPC-808-003W-ST**