MOT706_OEM Users Guide

- Supports MOT700x and MOT300-25 TEC Controller modules
- Very small footprint (50mm x 35mm)
- Up to +/-3A TEC current
- 3V to 5V operation
- Complete evaluation and verification solution
- Fully RoHs compliant

Introduction:

The MOT706_OEM has all the functionality of the MOT705_OEM in a smaller footprint (50mm x 35mm).

The MOT706_OEM is designed to allow the user to quickly evaluate and implement a Thermoelectric Cooler (TEC) design based on the MOT700x and MOT3000 series TEC controller modules.

The small footprint is specially useful for OEM applications where it can be directly incorporated in your system.

A small connector allows all the control and monitoring signals to be accessed and used with users microcontroller. It is also can be used standalone utilizing on-board potentiometers to set target temperature and monitor object temperature, TEC current and temperature alarm status.

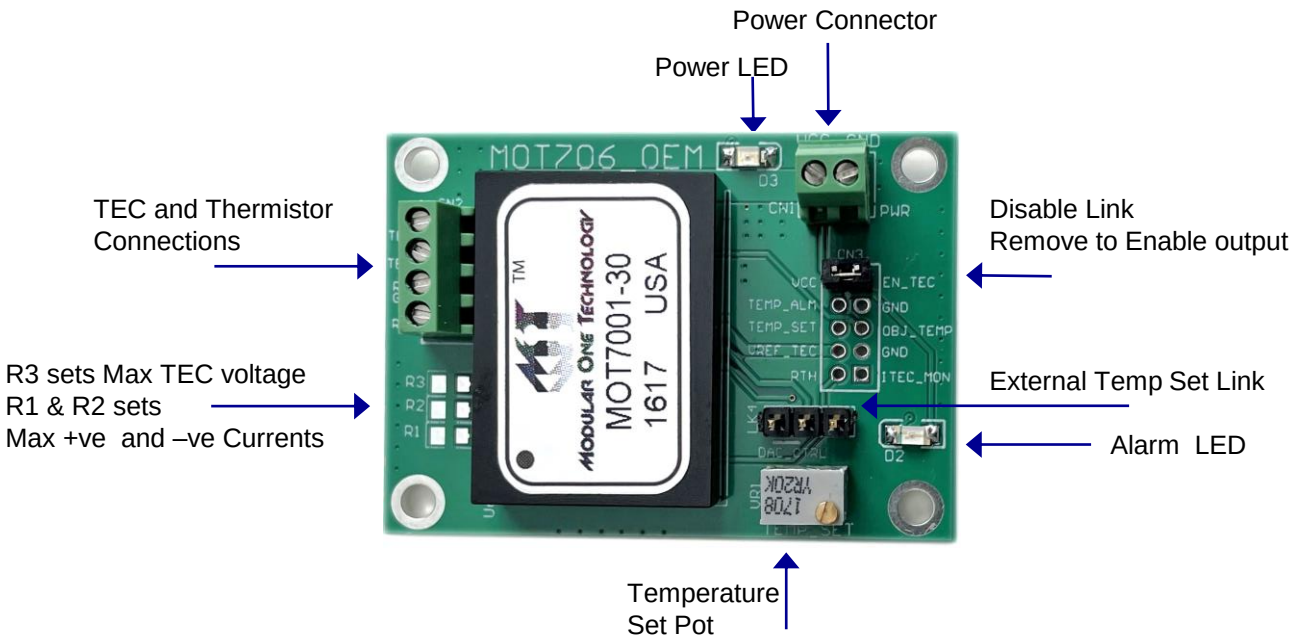
This User's Guide describes the various functions of the board, how to set it up and how to use it in a system.

Please also refer to the MOT700x & MOT3000-25 series datasheet for further description of the module functionality.

Before applying power to the EVM please ensure that jumpers are set and that VMAX , IMAXP, and IMAXN is limited if required for your TEC. (see following pages)

Contents:

Component Identification:



Quick Start

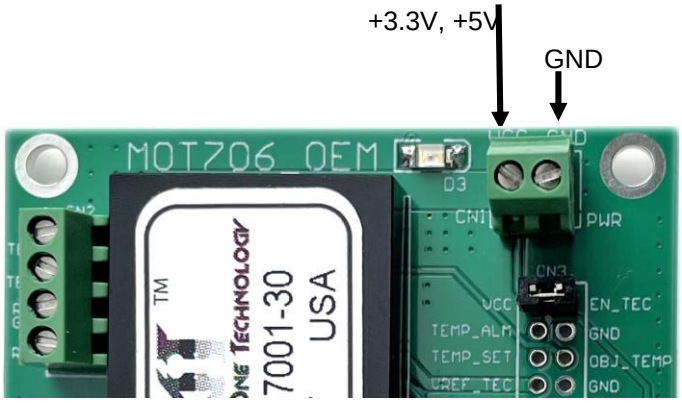
1. Verify the jumper settings:
   Leave enable link open.
   LK4: In the default position uses VR2 to set temperature. Only move to the optional position if micro is to control the TEC controller.
3. Add R3 if necessary (default is open for maximum output voltage).
4. Add R1 and R2 if necessary (default is open for maximum positive & negative current)
5. Connect the TEC and thermistor and/or Object Board.
6. Attach the power supplies *(be sure to observe correct polarity – see below) and GO!*

Note: The Alarm LED will light until the object temperature reaches the set value at which time the LED will go out – typically within 30 seconds

FUNCTIONAL DESCRIPTIONS

Power Supply

An appropriate power supply should be connected to CN1. The supply voltage may be from 3.3V to 5V as required. When supply voltage is present D3 will illuminate green

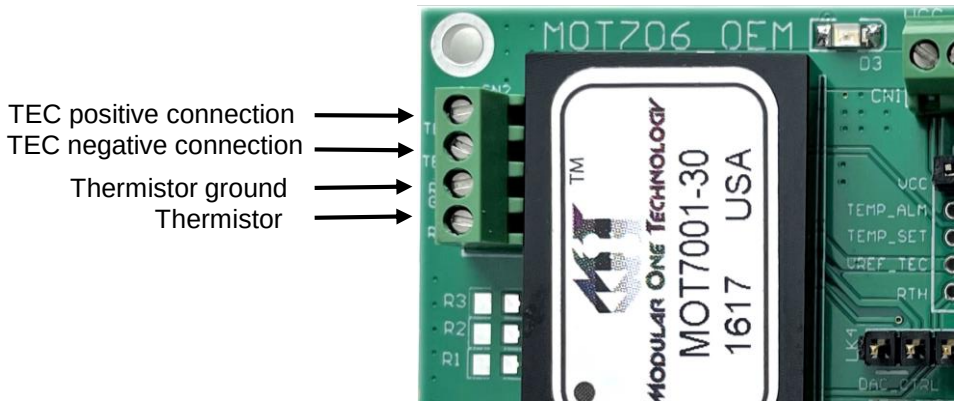


TEC Connection

The TEC is connected via CN2. A temperature feedback thermistor connected to the object being controlled is also connected to CN2.

If the MOTEVM_OBJ board is being used the thermistor is already installed on the board. In addition, series diodes on the board can be used as a dummy heat source.

The current through these diodes is set by VR2 and the connection to them is via CN2. (see MOTEVM_OBJ Object Board)



To verify TEC polarity monitor the voltage on the RTH terminal and the center pin on LK4 (V_{TEMP_SET}). The voltage at RTH should be moving towards V_{TEMP_SET}. If it is moving away, towards 0V or 1.5V, then the connections are reversed.

Maximum Output Voltage

By default the MOT706_OEM ships with the VMAX_SET pin open, resulting in maximum output voltage swing. In some applications it may be desired to reduce the maximum voltage and this can be accomplished by the addition of a single resistor, R1.

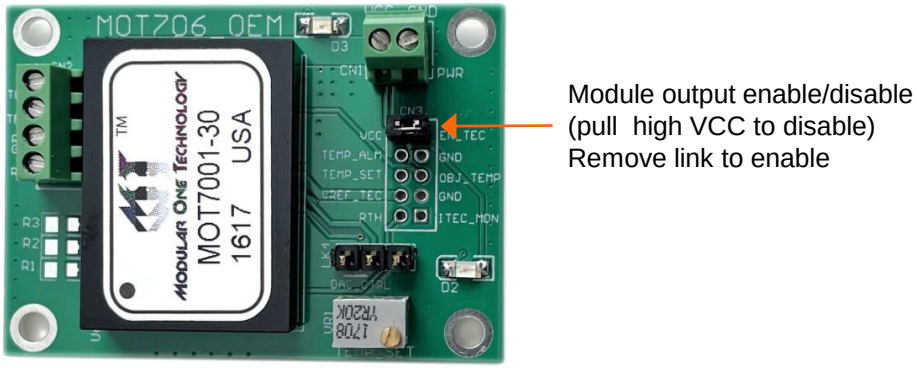
See the MOT700x data sheet for calculating values for R1, R2, and R3.

Maximum Output positive & negative currents

By default the MOT706_EVM ships with the IMAXP_SET & IMAXN_SET pin open, resulting in maximum output currents. In some applications it may be desired to reduce the maximum currents and this can be accomplished by the addition of a resistors, R2 and R3.

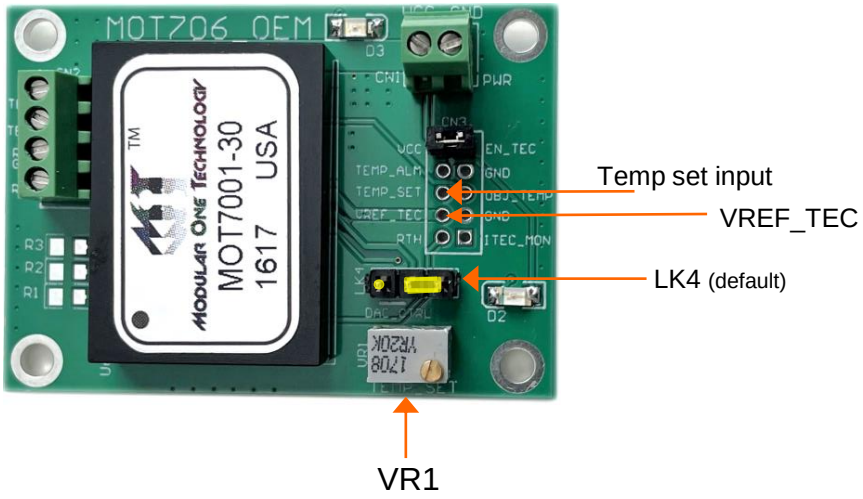
Module Enable

By default the module will power up when a supply voltage is applied (no link). If it is desired to disable the module the EN_TEC pin should be connected to VCC, which can be accomplished by using a link as indicated. When the link is removed the module will perform a soft start and resume operation.



Temperature Setting

The required object temperature can be adjusted by means of VR1. LK2 should be set to the default position for this mode.



Alternatively the object temperature can be set by an external voltage applied to TEMP_SET_ DAC on CN3. The reference voltage, VREF_TEC, is also available on CN3 and can be used as a reference for an external DAC. In this mode LK4 should be altered to the DAC__CTRL position.

Notes: Refer to the MOT700x data sheet for relationship between control voltage and object temperature.
If no control voltage is applied to TEMP_SET internal biasing will set the temperature to approximately 25˚C.

Temperature Alarm

Internal circuitry monitors the object temperature and will set an alarm flag when the temperature deviates by more than +/- 1.5˚ C. D2 will illuminate red when the alarm is set. The alarm status can also be monitored via TEMP_ALM at CN3.

Once the temperature returns to within limits the flag will automatically reset (D2 will go off).

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