TEH-2D-U Bidirectional Ultra-Low Voltage DC-DC Boost Converter

INTRODUCTION

Thermoelectric energy harvesting provides a powerful tool in the ability to harness waste heat from industrial or even biological processes for the purposes of powering low-power devices. The recent emergence of wearable technology has prompted many individuals to monitor their vital statistics or power simple devices that allow them to connect to their environment via the "internet-of-things". The *TEH-2D-U Bidirectional Ultra-Low Voltage DC-DC Boost Converter* is able to convert voltages as small as **45mV into an unregulated DC output between approximately +5V and +12V** for powering a variety of sensors, LEDs, microcontrollers, and other solid state electronics. With its small form factor of only 0.47 square inches, it is the perfect solution for the implementation of size-constrained wearable technology and monitoring systems.

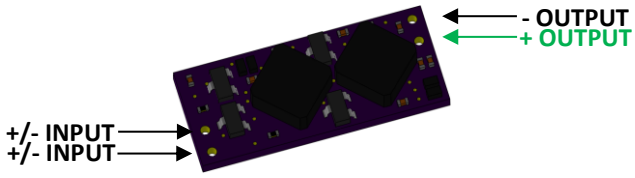


Figure 1: TEH-2D-U Ultra-Low Voltage Boost Converter Board

TYPICAL PERFORMANCE CURVES

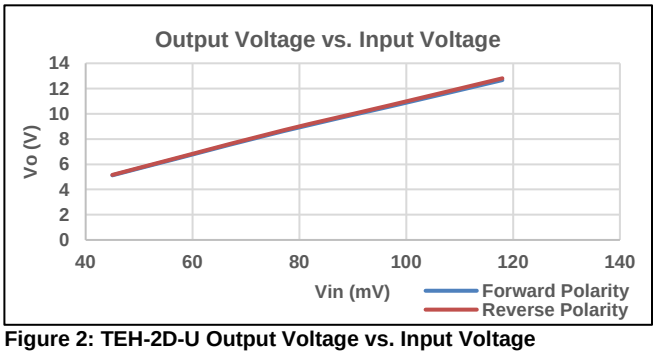


Figure 2: TEH-2D-U Output Voltage vs. Input Voltage

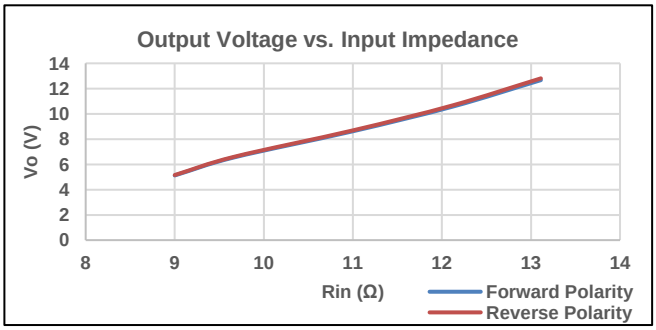
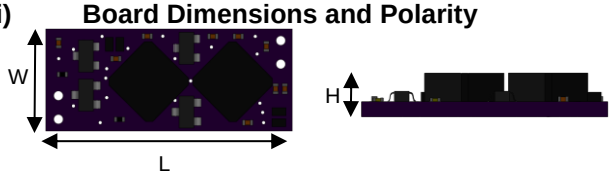


Figure 3: TEH-2D-U Output Voltage vs. Input Impedance

TECHNICAL SPECIFICATIONS

(i) Board Dimensions and Polarity



L = 26.5 ± 0.5 mm
(1.04 ± 0.02 in)
W = 11.5 ± 0.5 mm
(0.453 ± 0.02 in)

H = 5.5 ± 0.5 mm
(0.216 ± 0.02 in)

(ii) Electrical Specifications

Parameter	*Value*	*Units*
Minimum Input Voltage	45	mV
Maximum Input Voltage	120	mV
Nominal Output Voltage	+5 to +12V	V
Typical Input Current at Minimum V_{IN}	5	mA

NOTES

The values represented in this datasheet are to be taken as guidelines only, as many different operating conditions could influence the voltage and ultimately power output for the end user. ***Caution must be taken such that the polarity of the output from the board must be maintained to be electrically consistent as per the drawings given in Figure 1. The user should also operate within the given input range specified in the "Electrical Specifications" section of this document. Any operation above this range may cause irreparable damage.*** The TEH-2D-U can be utilized with any low power source, including, but not limited to thermoelectric modules, solar cells, and other energy harvesting devices that can output voltages within the ranges given in the "Electrical Specifications" of this document. The user should be aware that **the output is an unregulated voltage and the use of external circuitry for voltage regulation may be required.**

ORDERING INFORMATION AND TECHNICAL INQUIRIES

Please visit Thermal Electronics Corp. online at www.tecteg.com for ordering, associated product literature, and detailed contact information. For low ΔT applications, and if size permits, the TEG2-126LDT TEG module is a good selection to use with the TEH-2D-U as it was designed for use in environments where the supply of heat is low. Other modules can be design is size is a factor. Please contact Thermal Electronics Corp. by email at tecteg@rogers.com.