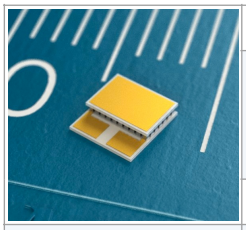
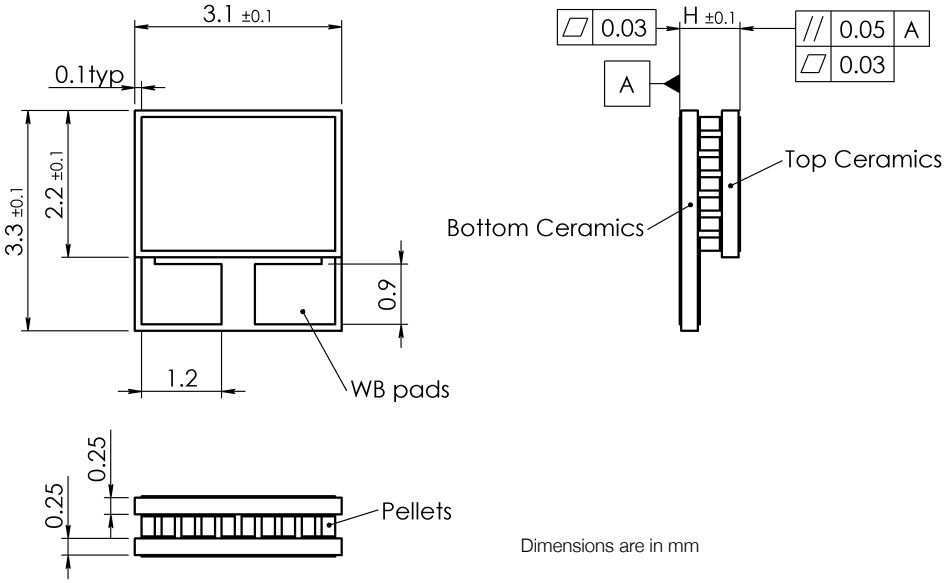
Performance Parameters — 1MD02-035-xxTEG

	TEG PERFORMANCE AT SPECIFIED HOT SIDE TEMPERATURE												H mm
	Optimum Power Output Pout, W			Optimum Voltage Uout, V			Open Circuit Voltage Uoc, V			Resistance ACR, Ohm			
	85ºC	55ºC	35ºC	85ºC	55ºC	35ºC	85ºC	55ºC	35ºC	85ºC	55ºC	35ºC	
1MD02-035-03TEG	0.03	0.01	0.001	0.51	0.24	0.07	0.88	0.42	0.12	6.06	5.63	5.34	0.8

Performance values are specified for TEG cold side at +27ºC, Dry Air. Optimum Power and Voltage are given at Optimum Load Resistance

Dimensions



Dimensions are in mm

Manufacturing options

A. TEG Assembly:

1. Solder Sn-Sb, T_{melt}=230°C (default assembly solder)
2. Solder Au-Sn, T_{melt}=280°C (optional solution, by request)

B. TEG Ceramics:

1. Al_2O_3(100%) - default
2. AlN - by request

C. Ceramics Surface Options:

1. Blank ceramics - default
2. Metallized (Au plating)
3. Metallized and pre-tinned with:
   - 3.1. In-Sn, T_{melt} =117°C
   - 3.2. Sn-Bi, T_{melt} = 138°C
   - 3.3. In-Ag, T_{melt} = 143°C
   - 3.4. In, T_{melt} = 157°C
   - 3.5. Pb-Sn, T_{melt} =183°C
   - 3.6. Optional type (can be specified by Customer)

D. Thermistors (optional)

Can be mounted to ceramics edge. Calibration is available by request.

E. Terminal contacts

1. Blank, tinned Copper Wires
2. Insulated Wires
3. Insulated, color coded
4. WB pads or Posts (default)
5. Flip-Chip (optional)

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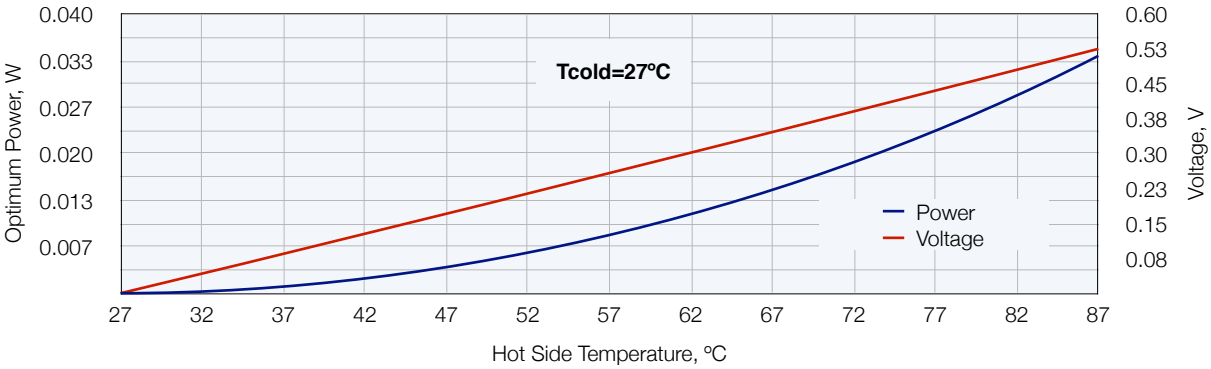
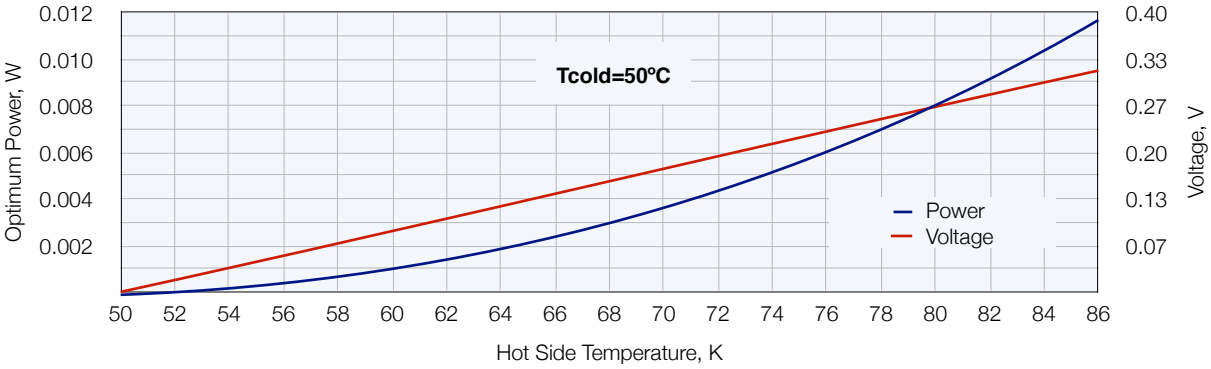
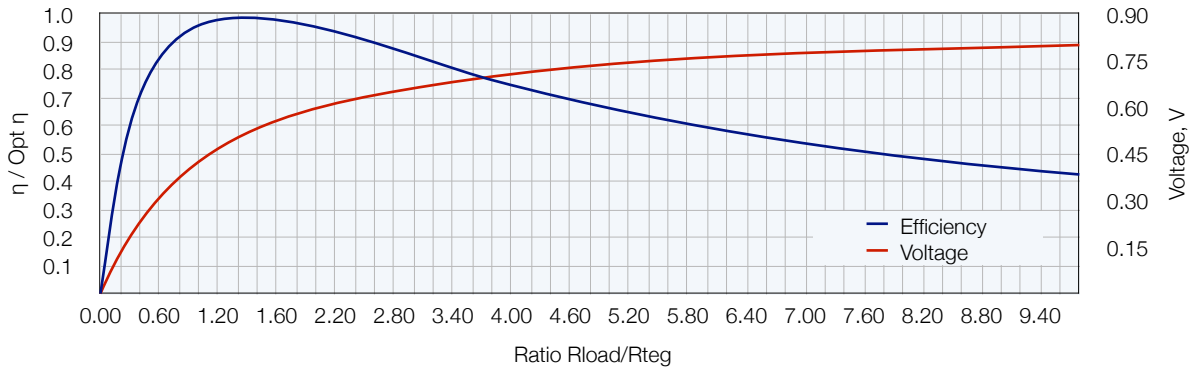
Performance Data — 1MD02-035-03TEG





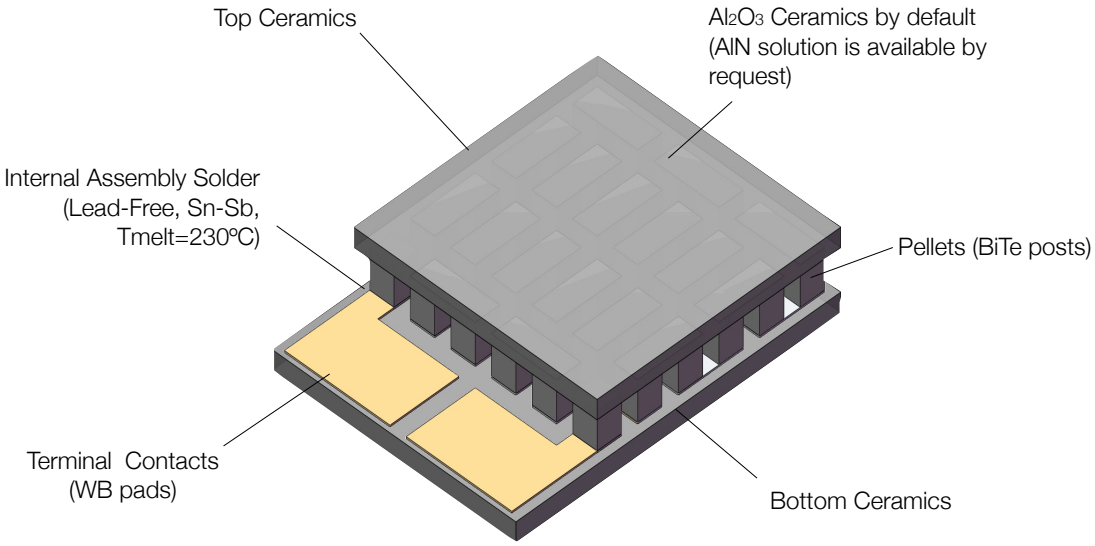


Performance data at Optimum Load Resistance (Rload)

Parameter	Units	Values at Hot Side Temperature		
		85°C	55°C	35°C
Cold Side Temperature, Tcold	°C	27	27	27
Optimum Efficiency, Opt η	%	2.67	1.34	0.39
Optimum Power, Popt	W	0.031	0.008	0.001
Optimum Voltage, Uopt	V	0.507	0.241	0.068
AC Resistance, Rteg	Ohm	6.06	5.63	5.34
Optimum Load Resistance, Rload	Ohm	8.18	7.60	7.16
Open Circuit Voltage,Uoc	V	0.88	0.42	0.12
Short Circuit Current, Isc	A	0.15	0.07	0.02
Thermal Resistance, Rt	°C/W	49.21	49.16	49.06

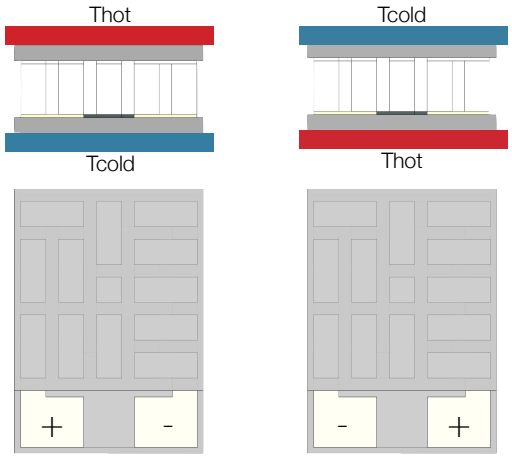
Note: Power Generation performance charts are specified in Optimum conditions, dry air, with cold side temperature set at +27°C and 50°C. Heatsink thermal resistance is not included into estimations.

Thermoelectric Generator Overview



Application Tips

1. Never heat TEG module more than 200˚C (TEG is assembled at 230˚C).
2. TEG module to be fixed between hot and cold exchangers with an optimal thermal contact for the best efficiency. Improper contact may reduce dT level and power output.
3. TEG polarity depends on applied hot and cold side orientation



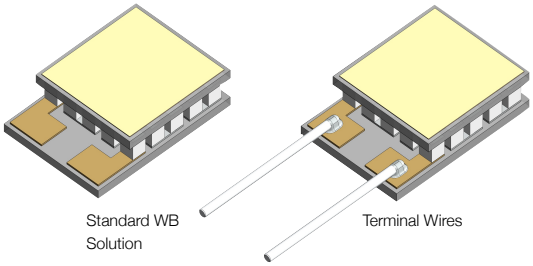
Installation

1. Mechanical Mounting. TEG is placed between two heat exchangers . This construction is fixed by screws or in another mechanical way. It is suitable for relatively large TEG modules (with dimensions 15x15mm^2 and larger). Miniature TEG types may require another assembling methods.
1. Soldering. This method is suitable for a TEG module with metallized outside surfaces. RMT provides this option and also makes pre-tinning for TE generators.
2. Glueing. It is an up-to-date method that is used by many customers due to availability of glues with good thermoconductive properties. A glue is usually based on some epoxy compound filled with some thermoconductive material such as graphite or diamond powders, silver, SiN and others. The application of a specific type depends on application features and the type of a TEG module.

Additional Options

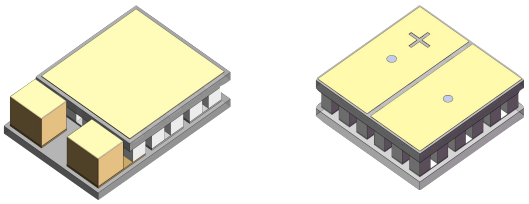
Terminal Contacts Options

The wires by default are of tinned Copper, blank (not insulated). Various options for isolated wires are available by request. The available solutions include isolated wires, isolated color-coded wires, flexible multicore wires and more.



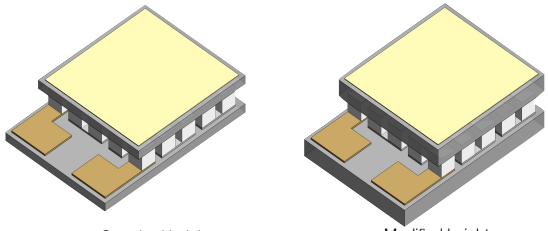
Terminal Contacts Modification

TE Generator terminal contacts can be modified from standard WB pads solution to WB posts type or Flip-Chip if required.



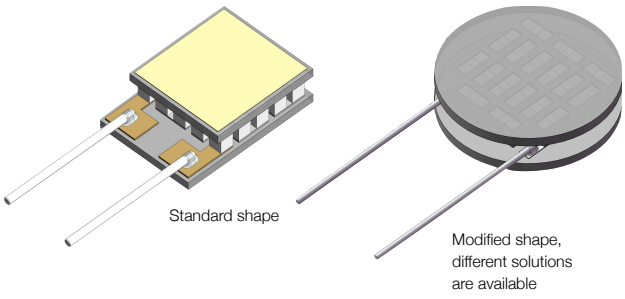
TEG Height Modification

Standard thermoelectric generator height can be modified without performance changes by using ceramics of different thickness. Standard thermoelectric generator height (specified in this datasheet) may be modified in a range -0.5..+1.0mm.

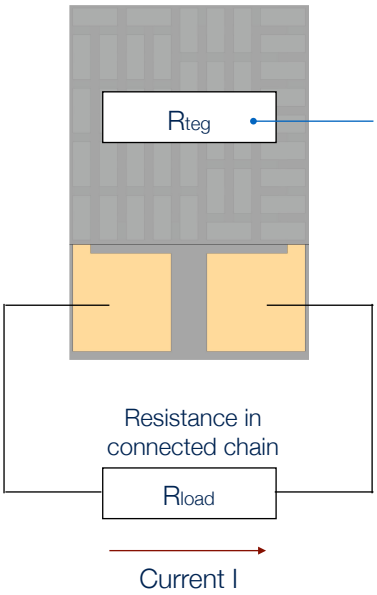


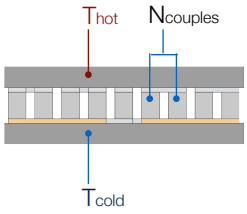
TEG Shape Modification

Standard thermoelectric generator shape can be modified without performance changes RMT has full-featured flexibility with thermoelectric generator shape and ceramics modification.



Thermoelectric Generator Basics





α = 400uV/K

Simplified TE Generator estimations

The level of power output of thermoelectric generator in conditions specified can be estimated by the following formulas.

$$E = \alpha \times (T_{hot} - T_{cold}) \times N$$

$$I = \frac{E}{(R_{teg} + R_{load})}$$

$$P_{out} = I^2 \times R_{load}$$

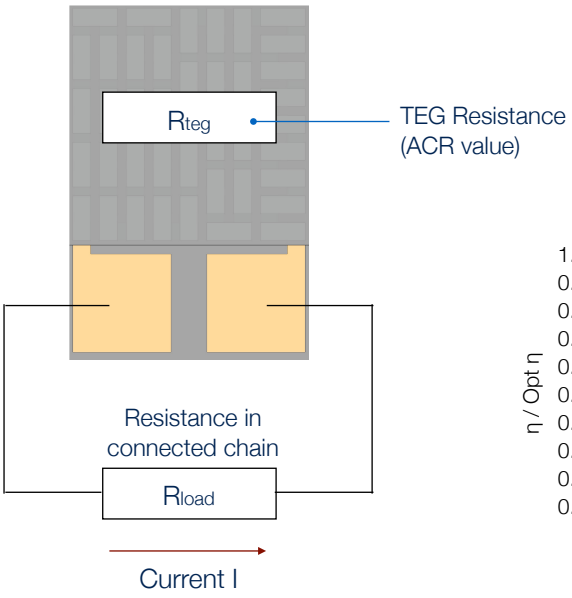
Getting data from TEG type name

RMT thermoelectric generators have a nomenclature system that allows to get the required data for estimations quickly.

1MD02-035-05TEG
Ncouples

General Rteg (ACR) values are specified in the datasheet in main table (page 1). Thermoelectric generator Rteg value depends on the ambient temperature.
For the precise estimations, please, contact RMT specialists directly.

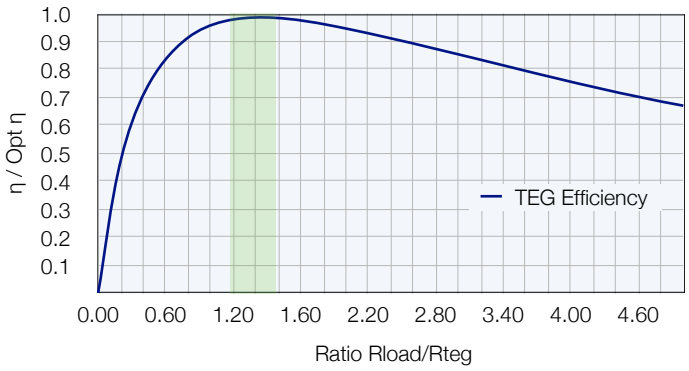
Thermoelectric Generator Basics

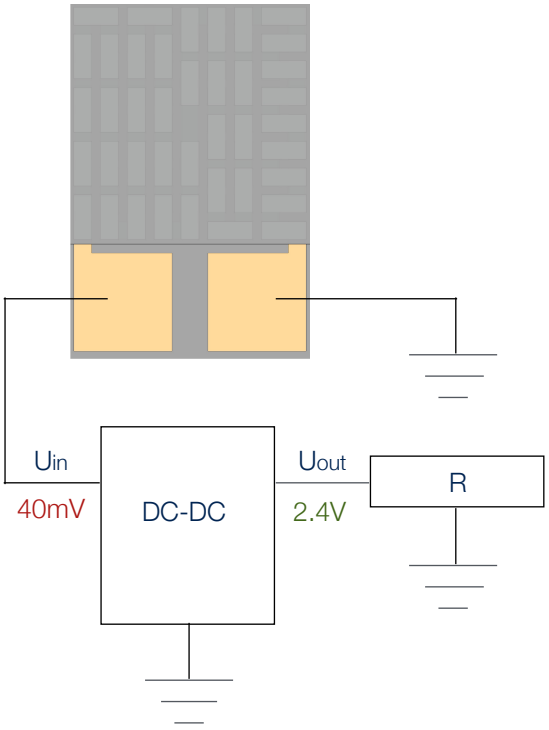


Resistances and TEG Efficiency

Thermoelectric generator best efficiency is reached at Load Resistance (Rload) close to thermoelectric generator resistance Rteg.

In most cases thermoelectric generator best efficiency is reached at Rload/Rteg ratio in a range 1.2 - 1.4





Output voltage and DC-DC converters

DC-DC converters are recommended to use with miniature thermoelectric generators, especially in low dT mode.

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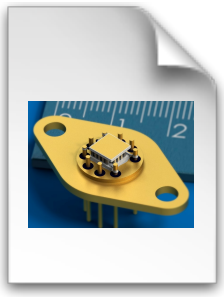

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