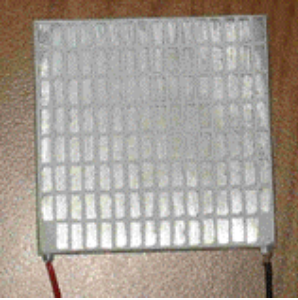


Bismuth telluride TEG Modules

The power module is designed and manufactured by a unique technology for converting heat energy directly into electricity. The thermoelectric module is based on Bi_2Te_3 and can work at temperatures as high as 260°C (500F) continuously and intermittently up to 380C(680F) without degrading. The thermoelectric module will generate DC electricity as long as there is a temperature difference across the module. The more electricity will be generated when the temperature difference across the module increases, and the efficiency of converting heat energy into electricity will also increase.

The unique technology also ensures the modules can withstand large temperature range cycling without degrading. The modules can be in single ceramic plate and double ceramic plate pattern per client's request. We also provide ceramic plates as partition in thermally conductive and electrically non-conductive.

Currently, modules with 126 couples in size of 40mmx40mm and 56mmx56mm series are available as per below. Also available in 30mmx30mm size.

Part Number	Specification	
TEP1-1264-3.4	<p>The following specification are based on that the hot side temperature is at 230C and cold side at 50C.</p> <ul style="list-style-type: none"> • Size: 40mmx40mm • Open circuit voltage*: 8.8volts • Internal resistance: 7 Ohm • Match load output* voltage: 4.3V • Match load output current:: 0.6A • Match load output Power:: 2.6W • Heat flux across the module: about 60watts • Heat flux density: about 3.75watts/cm² 	
TEP1-1264-1.5	<ul style="list-style-type: none"> • Size: 40mmx40mm • Open circuit voltage: 8.6volts • Internal resistance: 3 Ohm • Match load output voltage: 4.2V • Match load output current:: 1.4A • Match load output power:: 5.9W • Heat flux across the module: about 140watts • Heat flux density: about 8.8watts/cm² 	

<p>TEP1-12656-0.8</p>	<ul style="list-style-type: none"> • Size: 56mmx56mm • Open circuit voltage: 8.7volts • Internal resistance: 1.7 Ohm • Match load output voltage: 4.2V • Match load output current:: 2.5A • Match load output power:: 10.5W • Heat flux across the module: about 240watts • Heat flux density: about 8watts/cm²
<p>TEP1-12656-0.6</p>	<ul style="list-style-type: none"> • Size: 56mmx56mm • Open circuit voltage: 8.6volts • Internal resistance: 1.2 Ohm • Match load output voltage: 4.2V • Match load output current:: 3.5A • Match load output power:: 14.7W • Heat flux across the module: about 350watts • Heat flux density: about 11watts/cm²

* The open circuit voltage is the output voltage of the module without any load connected. The match load output is the output of module when the load resistance is equal to the module's internal resistance. The output voltage or current will change with the load. The output power is at maximum at matched load, .

Beyond the exiting modules above, we also make according to special requirement.

Test data

Some electrical testing data for TEP1-1264-1.5 is listed below:

The data is obtained at $T_h=200C$ and $T_c=70C$.

The heat flux under the $T_h=200C$ and $T_c=70C$ is 110Watts

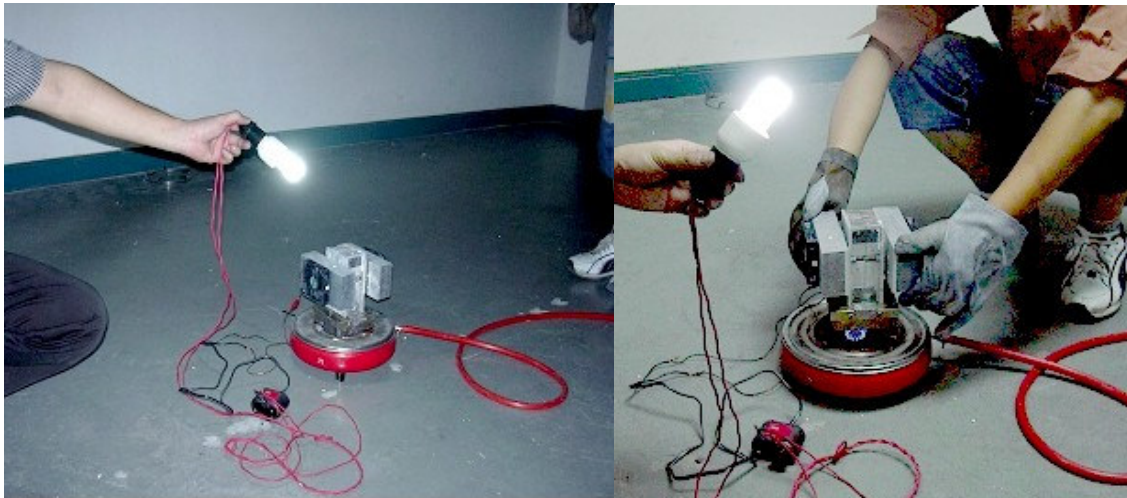
Load Resistance(Ohm)	Output Voltage(v)	Output Current(A)	Output Power(Watts)
Open Circuit	6.28		
0.9	1.44	1.60	2.3
1.4	2.04	1.46	3.0
1.8	2.53	1.4	3.5
2.3	2.88	1.25	3.6
2.6	3.08	1.18	3.65
2.8	3.21	1.15	3.7
3.0	3.28	1.09	3.6
3.2	3.40	1.06	3.6
3.6	3.55	0.99	3.5
3.8	3.61	0.95	3.43
4.4	3.85	0.88	3.4
5.0	4.01	0.80	3.2
5.6	4.19	0.75	3.14
6.4	4.43	0.69	3.06
8.4	4.7	0.56	2.65
10	4.94	0.49	2.42

The modules can be connected in series and parallel in order to get higher power levels.

The advantage of thermoelectric power generation.

1. Convert waste heat into electricity.
2. No moving part, no noise, reliable and free of maintenance, good to be used for making generators for remote sites.
3. Can be used with any fuel or heat source.
4. Being Light and small, the module can be used to make a mini size generator.

The below is a portable generator prototype, in size of 14cmx16cmx15cm, and weight of about 1.6kgs. It can be put in any stove with pilot flame. It uses 2pcs our TEP1-1264-3.4 modules and can generate 4-6W 12V DC electricity. The pictures demonstrate that the generator can light up a 5W 12VDC energy save bulb. It is good in outdoor activity for battery charge, light a bulb and power portable electronic items or a DC fan for cooling. It is light, small, silent and can be used with any stove.



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