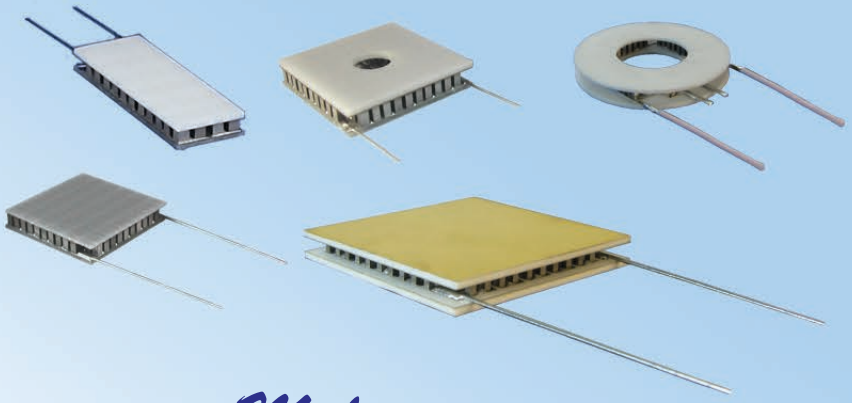
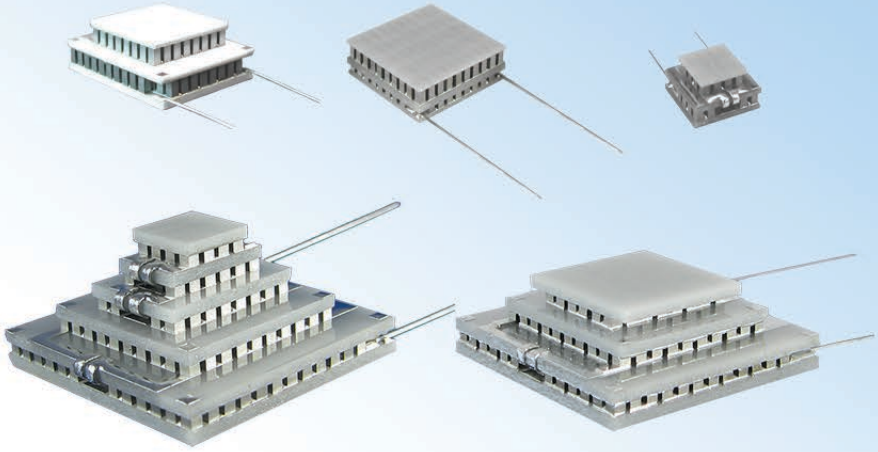
Thermion Company

Miniature Thermoelectric Coolers

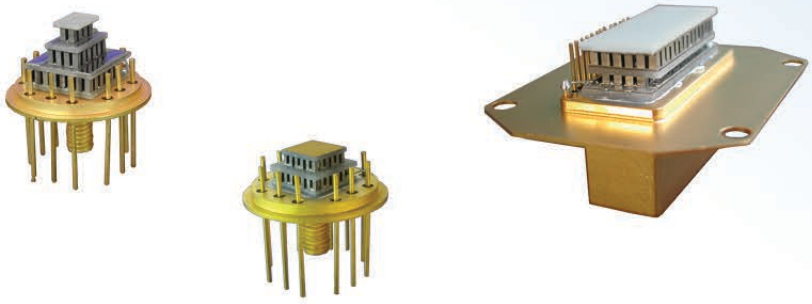
Single-stage



Multi-stage



Assemblies



Over 1300 models
Wide range of temperatures and power

APPLICATIONS

Cooling and Thermal Management

- IR detectors and sensors
- X-Ray detectors
- High sensitive CCDs
- Lasers and light-emitting diodes
- Fiber-optic and photonic equipment
- PC boards and processors
- Micro chips, electronic packages
- Scientific instruments

And lots of other electronic and photonic applications

Pb-free

All the TECs are RoHS compliant
Brazed on Lead-free solder with melting point of 230°C

For the TECs whose application is exempt under RoHS, the use of 183°C PbSn eutectic is possible on request.

ISO 9001:2015

ISO 2009:2015 Certified

Our policy is to make immediate scientific support for all our products at no charge for our customers

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Company profile

Thermion Company has arisen in 1994 on the basis of Scientific Group of Odessa State Academy of Refrigeration, Ukraine, which carried out researches in thermoelectricity since 1960. Our staff has over 60 years experience in research, development and manufacturing thermoelectric components and systems.

Thermion is a leader in developing and producing Peltier micro modules destined for cooling and temperature control of small sized electronic and optoelectronic components such as X-Ray detectors, semiconductor lasers, light emitting diodes, IR detectors and charge-coupled devices. Thermion supports its products with extensive design and technical assistance including prompt computerized selection of the most efficient coolers for any specified application. Our theoretical methods and computer programs enable us to make fast and skilled design of optimized thermoelectric coolers having enhanced performance and reduced space requirements.

In our manufacturing practice we use selection of semiconductor materials to obtain excellent thermoelectric characteristics. Besides, permanent improvements in technology is the subject of intensive research of our staff. As a result, we have today all the components, which are necessary to produce superior thermoelectric product - adequate theory, efficient computer programs, perfect TE materials and modern technology

With this potential laid by, we are able to offer you high quality, superior performance thermoelectric modules at prices that give you a possibility to be competitive in marketing your own products.

ABOUT / Products

Thermion introduces several lines of miniature thermoelectric coolers which include single stage and multi stage modules. These coolers are solid state devices which act as heat pumps when DC current is supplied. They can cool or heat depending on the direction of electrical current.

Total four series of TE coolers are offered:

- TMC-Series of single-stage and multi-stage TECs with **"pyramidal"** configuration
- TMB-Series of multi-stage **cube-shaped** TECs with enlarged top dimensions
- TML-Series of **linear single-stage** TECs
- TLB-Series of **linear multi-stage** TECs with identical top and bottom dimensions

Each series includes three sub-series with different TE pellets cross-section and pitch.

The number of configurations is growing permanently in response to the most sophisticated customer requirements, and now more than 1300 standard sizes are available, cold side being in the range from 1x1 to 21x21 mm, maximum current ranging from 0.2 to 5 A, temperature difference - from 75°C in single-stage to 130°C in standard multi-stage models.

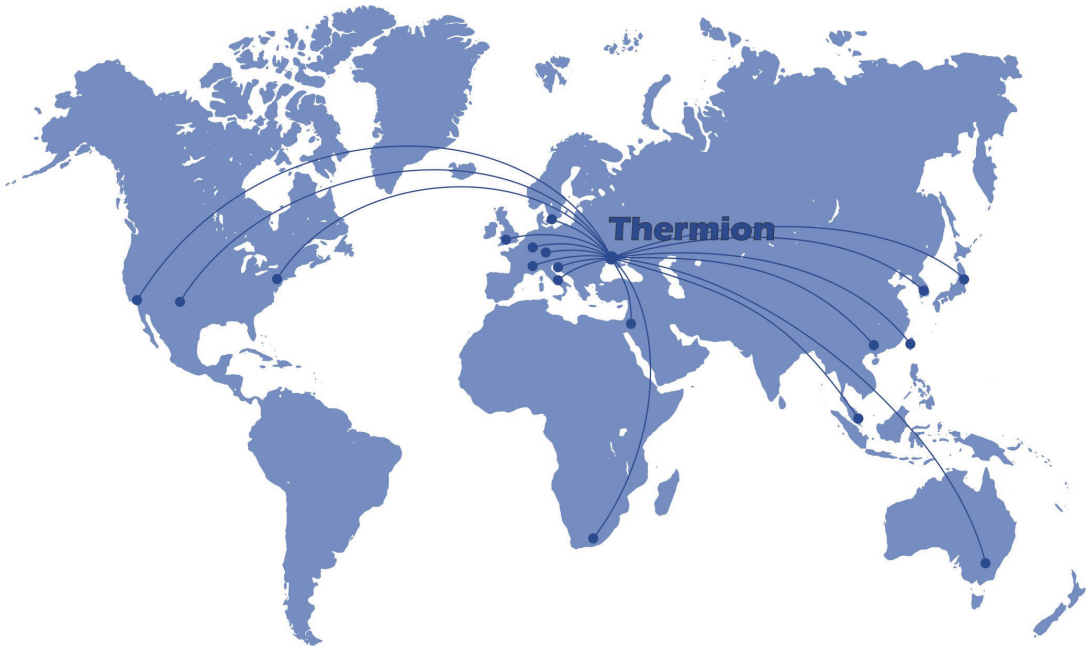
The TECs utilize superior quality TE materials and ceramic plates which provide full electrical insulation and excellent thermal conductivity. They are ideal for maintaining optimum operating temperature in applications where space and power restrictions predominate.

Normally, Thermion TECs are RoHS compliant assembled on lead-free 230°C solder. Thanks to junctions diffusion protection, they withstand heating to 220°C and fit for continuous operation at 120°C. For the TECs whose application is exempt under RoHS, the use of 183°C PbSn eutectic is possible on request.

ADVANTAGES

- Increased temperature difference
- Reduced input power
- Reduced feeding current
- Economic space requirements
- Increased heat flux density
- Short cool-down time
- Reliable operation at elevated temperatures
- Coolers with ΔT up to 150°C designed to specifications

Customers all over the World



Our policy is to satisfy customer's needs regardless of order volume - from a single unit to great commercial batches

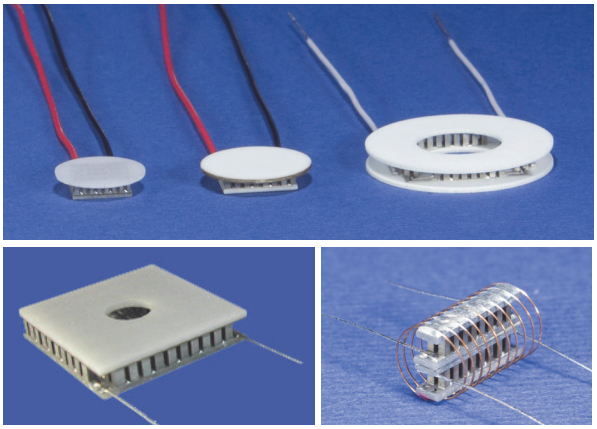
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Odessa 65009, Ukraine
+31 612 955797
info@thermion-company.com
Thermion-Company.com

CUSTOM MADE TE COOLERS AND SYSTEMS

In this catalogue you will find over 1300 TEC models with wide range of temperature differences and cooling power. But whatever variety of standard coolers is offered, the need of new special designs permanently arises due to specific customer requests. We consider our primary strength to be in economical custom TE coolers and systems design and manufacturing.

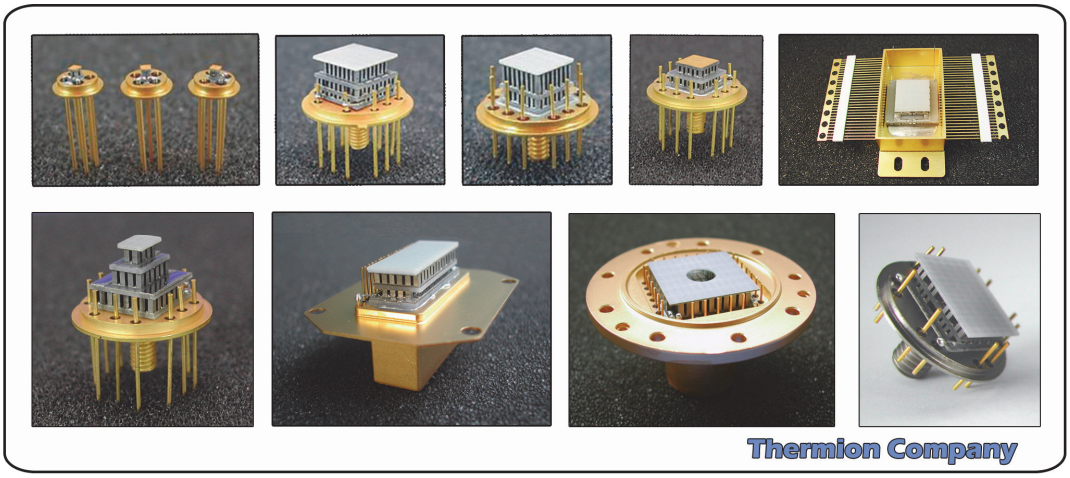
Thermion offers a wide spectrum of custom thermoelectric devices:

- Miniature TECs configured to specified requirements
- Thermoelectric devices with limit technical parameters:
  - sub-miniature TECs
  - high power density TECs
  - extremely fast response TECs
  - multi stage TECs with ΔT up to 150°C
- Modules mounted to electronic headers



ASSEMBLIES

Assemblies are available based on Thermion modules integrated into standard electronic housings (TO5, TO8, TO3, TO45, TO66, Butterfly) and custom designed packages.



RESEARCH AND DEVELOPMENT

Being R&D Company, Thermion participates in many scientific projects. The information about our scientific activity you can find at the section “Scientific Activity” at Thermion’s Web Site: www.thermion-company.com. Considerable theoretical and technological potential, presence of skilled specialists and possession of sufficient computer programs give our company an advantage to work at high scientific level. Please don’t hesitate to contact us for solution of any your thermal problem.

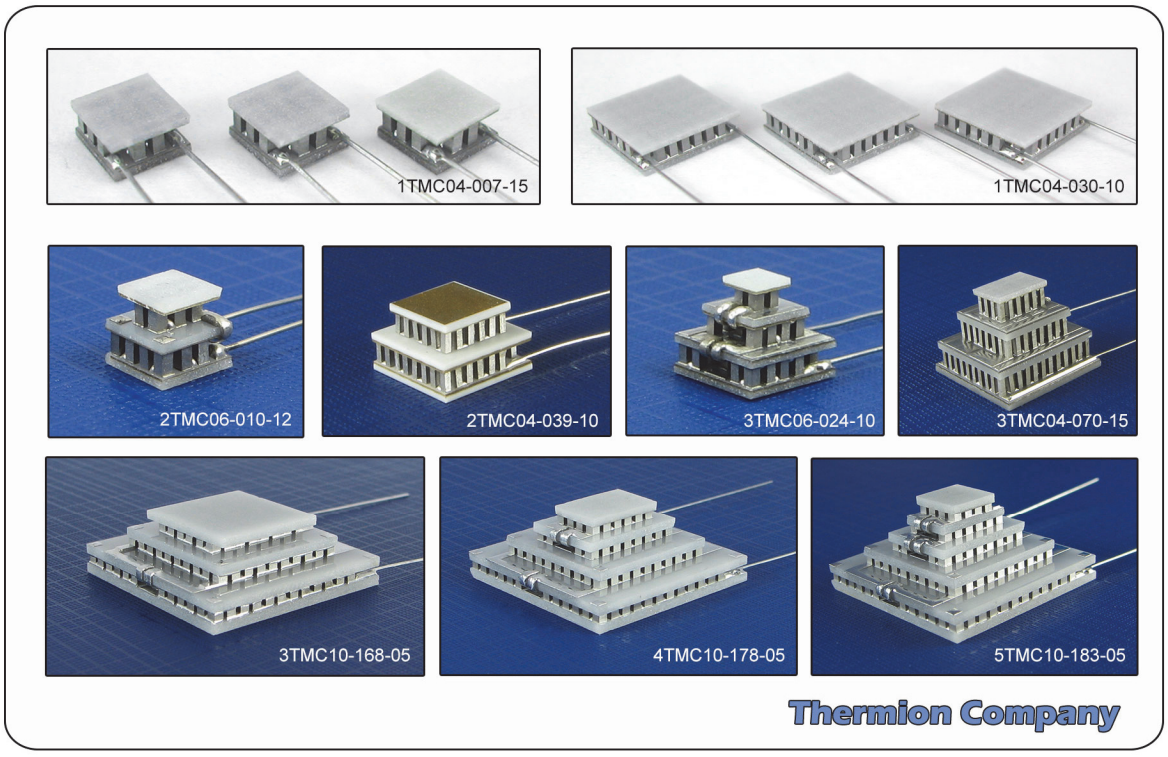
CONSULTING

If you are not sure what TE cooler should be selected or you need custom made device designed to specifications, please address directly to Thermion Company. Our specialists will be glad to assist you in choosing / working out TEC meeting your demands.

Features of TMC-Series TECs

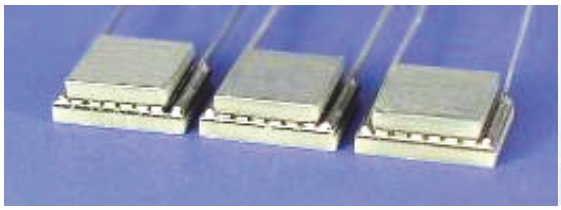
The TMC series is a line of miniature conventionally configured thermoelectric heat pumps in modular form designed for photonic and electronic applications. The series includes 3 sub-series (single and multi stage): TMC04, TMC06 and TMC10. Each sub-series is fabricated in several versions with TE leg lengths in the range from 0.3 to 2 mm. In such a way a great variety of TECs, covering wide range of temperature differences and heat-pumping capacities, is provided. The multi-stage coolers of this series have a specific “pyramidal” shape, making them ideal for spot cooling of miniature optoelectronic components such as semiconductor lasers, light-emitting diodes, detectors and other localized heat sources. Due to the use of high efficient TE materials, these TECs ensure temperature differences several degrees greater as compared with the best analogous designs available at the market.

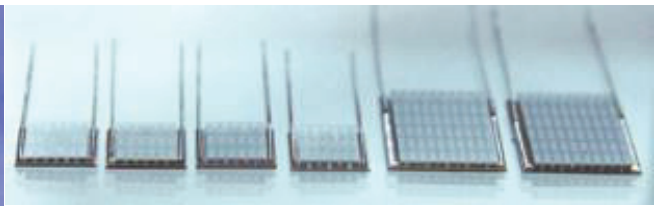
The series offered here includes a row of new advanced configurations, which are generated as a result of our analysis of the most exquisite customer’s demands. Among them is the TMC04 sub-series of cascade thermoelectric micro modules having advantage of reduced current, enlarged voltage and high ΔT. These modules with TE leg length shortened to 0.3 mm, having significantly increased cooling power density, are also available.



High Power Density TECs

Thermion represents a new series of short-legged thermoelectric micro modules with greatly enlarged cooling capacity. The units with TE leg length of 0.3 mm are available for cooling high power density electronic components. The use of aluminum nitride substrates coupled with application of high quality TE materials enables achieving temperature differences as high as those for much larger standard commercial coolers. Another advantage of the modules is extremely short cool-down time.





Model	No. of couples	Umax (V)	Qmax (W)	Dimensions (mm)	
				Top	Bottom
1TMC04-XXX-03 ***TE leg length 0.3mm*** Height – 1.4 mm (1 mm available), *Imax*=2.6 A, ∆*Tmax*=70±2 K					
1 TMC04-004-03	4	0.47	0.71	1.6x3.2	3.2x3.2
1 TMC04-008-03	8	0.93	1.41	3.2x3.2	4.8x3.2
1 TMC04-012-03	12	1.4	2.12	3.2x4.8	4.8x4.8
1 TMC04-018-03	18	2.1	3.18	4.8x4.8	6.4x4.8
1 TMC04-024-03	24	2.8	4.24	4.8x6.4	6.4x6.4
1 TMC04-032-03	32	3.7	5.65	6.4x6.4	8x6.4
1 TMC04-050-03	50	5.8	8.83	8x8	9.6x8
1 TMC04-060-03	60	7	10.6	8x9.6	9.6x9.6
1 TMC04-072-03	72	8.3	12.7	9.6x9.6	11.2x9.6
1TMC06-XXX-03 ***TE leg length 0.3mm*** Height – 1.4 mm (1 mm available), *Imax*=5.85 A, ∆*Tmax*=70±2 K					
1 TMC04-004-03	4	0.47	1.59	2x4	4x4
1 TMC04-008-03	8	0.93	3.15	4x4	6x4
1 TMC04-012-03	12	1.4	4.72	4x6	6x6
1 TMC04-018-03	18	2.1	7.2	6x6	8x6
1 TMC04-024-03	24	2.8	9.45	6x8	8x8
1 TMC04-032-03	32	3.7	12.6	8x8	10x8
1 TMC04-050-03	50	5.8	19.8	10x10	12x10
1 TMC04-060-03	60	7	23.8	10x12	12x12
1 TMC04-072-03	72	8.3	28.6	12x12	14x12

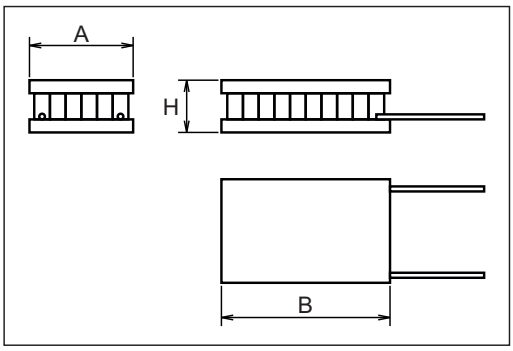
All the multi-stage modules of TMC04 and TMC06 series with TE leg 0.3 mm long is also available. This gives an advantage of 70% higher cooling capacity as compared with the most powerful standard TECs with TE legs 0.5 mm long. To ensure further increase in the heat flux density at the substrate level, we practice tight packing of the TE legs together with their shortening.

TMC04 Sub-Series: Standard TEC

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC04-007-XX *N=7 Top = Base = AxB = 3.2x3.2 Umax=0.84 V*				
1TMC04-007-15	2.65	0.55	74	0.27
1TMC04-007-12	2.35	0.7	74	0.33
1TMC04-007-10	2.15	0.8	74	0.39
1TMC04-007-08	1.95	1	74	0.48
1TMC04-007-05	1.65	1.55	73	0.72
1TMC04-011-XX *N=11 Top = Base = AxB = 3.2x4.8 Umax=1.3V*				
1TMC04-011-15	2.65	0.55	74	0.42
1TMC04-011-12	2.35	0.7	74	0.52
1TMC04-011-10	2.15	0.8	74	0.6
1TMC04-011-08	1.95	1	74	0.75
1TMC04-011-05	1.65	1.55	73	1.15
1TMC04-017-XX *N=17 Top = Base = AxB = 4.8x4.8 Umax= 2 V*				
1TMC04-017-15	2.65	0.55	74	0.65
1TMC04-017-12	2.35	0.7	74	0.8
1TMC04-017-10	2.15	0.8	74	0.93
1TMC04-017-08	1.95	1	74	1.16
1TMC04-017-05	1.65	1.55	73	1.73
1TMC04-023-XX *N=23 Top = Base = AxB = 4.8x6.4 Umax= 2.8 V*				
1TMC04-023-15	2.65	0.55	74	0.88
1TMC04-023-12	2.35	0.7	74	1.08
1TMC04-023-10	2.15	0.8	74	1.27
1TMC04-023-08	1.95	1	74	1.57
1TMC04-023-05	1.65	1.55	73	2.35
1TMC04-030-XX *N=30 Top = Base = AxB = 6.4x6.4 Umax= 3.6 V*				
1TMC04-030-15	2.65	0.55	74	1.14
1TMC04-030-12	2.35	0.7	74	1.41
1TMC04-030-10	2.15	0.8	74	1.65
1TMC04-030-08	1.95	1	74	2.05
1TMC04-030-05	1.65	1.55	73	3.11

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC04-048-XX *N=48 Top = Base = AxB = 8x8 Umax= 5.8 V*				
1TMC04-048-15	2.65	0.55	74	1.83
1TMC04-048-12	2.35	0.7	74	2.26
1TMC04-048-10	2.15	0.8	74	2.64
1TMC04-048-08	1.95	1	74	3.28
1TMC04-048-05	1.65	1.55	73	4.95
1TMC04-058-XX *N=58 Top = Base = AxB = 8x9.6 Umax= 7 V*				
1TMC04-058-15	2.65	0.55	74	2.2
1TMC04-058-12	2.35	0.7	74	2.7
1TMC04-058-10	2.15	0.8	74	3.2
1TMC04-058-08	1.95	1	74	4
1TMC04-058-05	1.65	1.55	73	6
1TMC04-070-XX *N=70 Top = Base = AxB = 9.6x9.6 Umax= 8.4 V*				
1TMC04-070-15	2.65	0.55	74	2.65
1TMC04-070-12	2.35	0.7	74	3.28
1TMC04-070-10	2.15	0.8	74	3.88
1TMC04-070-08	1.95	1	74	4.77
1TMC04-070-05	1.65	1.55	73	7.22

TMC04 Series Single Stage – **Standard**



Definitions

N Number of thermocouples
T_h Hot side temperature
Imax Current resulting in greatest ΔT
Umax Voltage at I=Imax
ΔT_{max} Maximum temperature difference
Qmax Maximum cooling power (I = I max , ΔT=0)

Notes

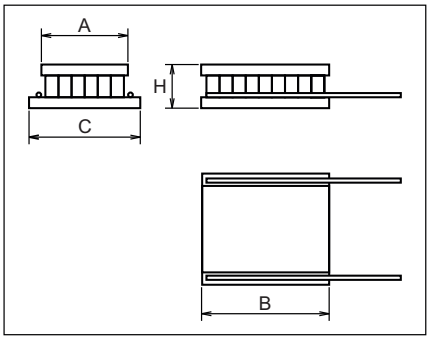
- Data shown are for Th=30^{O}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T_{max}$)
- Modules height can be varied on account of substrates thickness

1MC04 Sub-Series: OPTIONS

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC04-004-XX *N=4 AxB = 1.6x3.2, CxB = 3.2x3.2 Umax=0.47 V*				
1TMC04-004-15	2.65	0.55	74	0.15
1TMC04-004-12	2.35	0.7	74	0.19
1TMC04-004-10	2.15	0.8	74	0.22
1TMC04-004-08	1.95	1	74	0.28
1TMC04-004-05	1.65	1.55	73	0.41
1TMC04-004-03	1-1.4	2.6	70	0.71
1TMC04-008-XX *N=8 AxB = 3.2x3.2, CxB = 4.8x3.2 Umax=0.93 V*				
1TMC04-008-15	2.65	0.55	74	0.3
1TMC04-008-12	2.35	0.7	74	0.37
1TMC04-008-10	2.15	0.8	74	0.44
1TMC04-008-08	1.95	1	74	0.55
1TMC04-008-05	1.65	1.55	73	0.83
1TMC04-008-03	1-1.4	2.6	70	1.4
1TMC04-012-XX *N=12 AxB = 3.2x4.8, CxB = 4.8x4.8 Umax=1.4 V*				
1TMC04-012-15	2.65	0.55	73	0.47
1TMC04-012-12	2.35	0.7	73	0.55
1TMC04-012-10	2.15	0.8	73	0.67
1TMC04-012-08	1.95	1	73	0.82
1TMC04-012-05	1.65	1.55	72	1.24
1TMC04-012-03	1-1.4	2.6	70	2.1
1TMC04-018-XX *N=18 AxB = 4.8x4.8, CxB = 6.4x4.8 Umax= 2.1 V*				
1TMC04-018-15	2.65	0.55	74	0.68
1TMC04-018-12	2.35	0.7	74	0.82
1TMC04-018-10	2.15	0.8	74	1
1TMC04-018-08	1.95	1	74	1.22
1TMC04-018-05	1.65	1.55	73	1.9
1TMC04-018-03	1-1.4	2.6	70	3.2
1TMC04-024-XX *N=24 AxB = 4.8x6.4, CxB = 6.4x6.4 Umax= 2.8 V*				
1TMC04-024-15	2.65	0.55	74	0.91
1TMC04-024-12	2.35	0.7	74	1.1
1TMC04-024-10	2.15	0.8	74	1.34
1TMC04-024-08	1.95	1	74	1.63
1TMC04-024-05	1.65	1.55	73	2.5
1TMC04-024-03	1-1.4	2.6	70	4.2
1TMC04-032-XX *N=32 AxB = 6.4x6.4, CxB = 8x6.4 Umax=3.7 V*				
1TMC04-032-15	2.65	0.55	74	1.22
1TMC04-032-12	2.35	0.7	74	1.47
1TMC04-032-10	2.15	0.8	74	1.79
1TMC04-032-08	1.95	1	74	2.12
1TMC04-032-05	1.65	1.55	73	3.33
1TMC04-032-03	1-1.4	2.6	70	5.6

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC04-050-XX *N=50 AxB = 8x8, CxB = 9.6x8 Umax=5.8 V*				
1TMC04-050-15	2.65	0.55	74	1.9
1TMC04-050-12	2.35	0.7	74	2.3
1TMC04-050-10	2.15	0.8	74	2.8
1TMC04-050-08	1.95	1	74	3.42
1TMC04-050-05	1.65	1.55	73	5.2
1TMC04-050-03	1-1.4	2.6	70	8.8
1TMC04-060-XX *N=60 AxB = 8x9.6, CxB = 9.6x9.6 Umax=7 V*				
1TMC04-060-15	2.65	0.55	74	2.28
1TMC04-060-12	2.35	0.7	74	2.76
1TMC04-060-10	2.15	0.8	74	3.36
1TMC04-060-08	1.95	1	74	4.1
1TMC04-060-05	1.65	1.55	73	6.24
1TMC04-060-03	1-1.4	2.6	70	10.6
1TMC04-072-XX *N=60 AxB = 8x9.6, CxB = 9.6x9.6 Umax=8.4 V*				
1TMC04-072-15	2.65	0.55	74	2.74
1TMC04-072-12	2.35	0.7	74	3.3
1TMC04-072-10	2.15	0.8	74	4
1TMC04-072-08	1.95	1	74	4.9
1TMC04-072-05	1.65	1.55	73	7.5
1TMC04-072-03	1-1.4	2.6	70	12.7

TMC04 Series Single Stage - **Option**



Definitions

N	Number of thermocouples
Th	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max , ΔT=0)

Notes

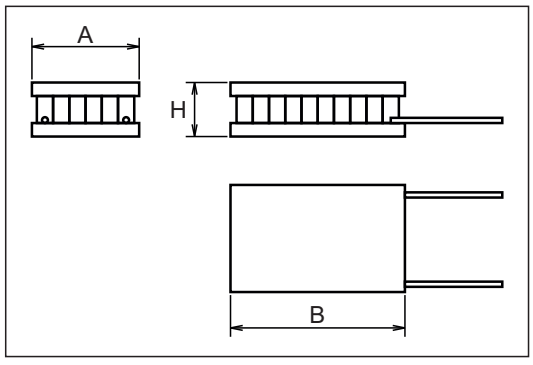
- Data shown are for Th=30°C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)
- Modules height can be varied on account of substrates thickness

TMC06 Sub-Series: STANDARD TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC06-007-XX *N=7 Top = Base = AxB = 4x4 Umax=0.84 V*				
1TMC06-007-15	2.65	1.3	74	0.6
1TMC06-007-12	2.35	1.6	74	0.74
1TMC06-007-10	2.15	1.9	74	0.87
1TMC06-007-08	1.95	2.3	74	q.08
1TMC06-007-05	1.65	3.5	73	1.62
1TMC06-011-XX *N=11 Top = Base = AxB = 4x6 Umax=1.3 V*				
1TMC06-011-15	2.65	1.3	74	0.94
1TMC06-011-12	2.35	1.6	74	1.16
1TMC06-011-10	2.15	1.9	74	1.36
1TMC06-011-08	1.95	2.3	74	1.69
1TMC06-011-05	1.65	3.5	73	2.6
1TMC06-017-XX *N=17 Top = Base = AxB = 6x6 Umax= 2 V*				
1TMC06-017-15	2.65	1.3	74	1.46
1TMC06-017-12	2.35	1.6	74	1.8
1TMC06-017-10	2.15	1.9	74	2.11
1TMC06-017-08	1.95	2.3	74	2.62
1TMC06-017-05	1.65	3.5	73	3.9
1TMC06-023-XX *N=23 Top = Base = AxB = 6x8 Umax=2.8 V*				
1TMC06-023-15	2.65	1.3	74	2
1TMC06-023-12	2.35	1.6	74	2.43
1TMC06-023-10	2.15	1.9	74	2..85
1TMC06-023-08	1.95	2.3	74	3.54
1TMC06-023-05	1.65	3.5	73	5.3
1TMC06-030-XX *N=30 Top = Base = AxB = 8x8 Umax=3.6 V*				
1TMC06-030-15	2.65	1.3	74	2.58
1TMC06-030-12	2.35	1.6	74	3.18
1TMC06-030-10	2.15	1.9	74	3.72
1TMC06-030-08	1.95	2.3	74	4.62
1TMC06-030-05	1.65	3.5	73	7

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC06-048-XX *N=48 Top = Base = AxB = 10x10 Umax=5.8V*				
1TMC06-048-15	2.65	1.3	74	4.12
1TMC06-048-12	2.35	1.6	74	5.08
1TMC06-048-10	2.15	1.9	74	5.95
1TMC06-048-08	1.95	2.3	74	7.39
1TMC06-048-05	1.65	3.5	73	11.1
1TMC06-058-XX *N=58 Top = Base = AxB = 10x12 Umax=7 V*				
1TMC06-058-15	2.65	1.3	74	4.98
1TMC06-058-12	2.35	1.6	74	6.15
1TMC06-058-10	2.15	1.9	74	7.19
1TMC06-058-08	1.95	2.3	74	8.93
1TMC06-058-05	1.65	3.5	73	13.5
1TMC06-070-XX *N=70 Top = Base = AxB = 12x12 Umax = 8.4 V*				
1TMC06-070-15	2.65	1.3	74	5.97
1TMC06-070-12	2.35	1.6	74	7.39
1TMC06-070-10	2.15	1.9	74	8.74
1TMC06-070-08	1.95	2.3	74	10.7
1TMC06-070-05	1.65	3.5	73	16.3

TMC06 Series Single Stage - **Standard**



Notes

- Data shown are for Th=30^{o}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)
- Modules height can be varied on account of substrates thickness

Definitions

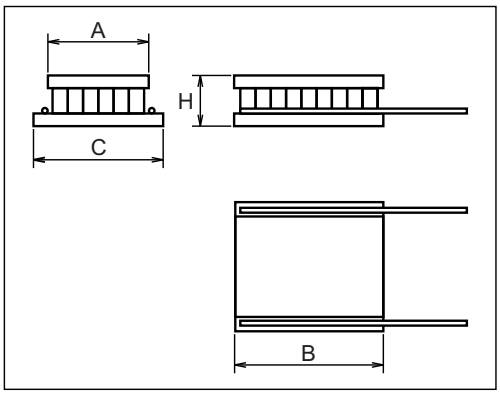
N	Number of thermocouples
Th	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max , ΔT=0)

TMC06 Sub-Series: OPTIONS

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC 06-004-XX *N=4 AxB=2x4, CxB = 4x4 Umax=0.48 V*				
1TMC 06-004-15	2.65	1.3	74	0.34
1TMC 06-004-12	2.35	1.6	74	0.42
1TMC 06-004-10	2.15	1.9	74	0.5
1TMC 06-004-08	1.95	2.3	74	0.62
1TMC 06-004-05	1.65	3.5	73	0.93
1TMC 06-004-03	1-1.4	5.8	71	1.59
1TMC06-008-XX *N=8 AxB = 4x4, CxB = 6x4 Umax=0.96 V*				
1TMC 06-008-15	2.65	1.3	74	0.7
1TMC 06-008-12	2.35	1.6	74	0.9
1TMC 06-008-10	2.15	1.9	74	1
1TMC 06-008-08	1.95	2.3	74	1.2
1TMC 06-008-05	1.65	3.5	73	1.9
1TMC 06-008-03	1-1.4	5.8	71	3.1
1TMC06-012-XX *N=12 AxB = 4x6, CxB = 6x6 Umax=1.4 V*				
1TMC06-012-15	2.65	1.3	74	1.1
1TMC06-012-12	2.35	1.6	74	1.3
1TMC06-012-10	2.15	1.9	74	1.5
1TMC06-012-08	1.95	2.3	74	1.8
1TMC06-012-05	1.65	3.5	73	2.8
1TMC06-012-03	1-1.4	5.8	71	4.7
1TMC06-018-XX *N=18 AxB = 6x6, CxB = 8x6 Umax= 2.2 V*				
1TMC06-018-15	2.65	1.3	74	1.6
1TMC06-018-12	2.35	1.6	74	1.9
1TMC06-018-10	2.15	1.9	74	2.2
1TMC06-018-08	1.95	2.3	74	2.7
1TMC06-018-05	1.65	3.5	73	4.2
1TMC06-018-03	1-1.4	5.8	71	7.2
1TMC06-024-XX *N=24 AxB = 6x8, CxB=8x8 Umax=2.8 V*				
1TMC06-024-15	2.65	1.3	74	2.1
1TMC06-024-12	2.35	1.6	74	2.5
1TMC06-024-10	2.15	1.9	74	3
1TMC06-024-08	1.95	2.3	74	3.7
1TMC06-024-05	1.65	3.5	73	5.5
1TMC06-024-03	1-1.4	5.8	71	9.5

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC06-032-XX *N=32 AxB = 8x8, CxB = 10x8 Umax=3.8 V*				
1TMC06-032-15	2.65	1.3	74	2.8
1TMC06-032-12	2.35	1.6	74	3.4
1TMC06-032-10	2.15	1.9	74	4
1TMC06-032-08	1.95	2.3	74	4.9
1TMC06-032-05	1.65	3.5	73	7.4
1TMC06-032-03	1-1.4	5.8	71	12.6
1TMC06-050-XX *N=50 AxB = 10x10, CxB = 12x10 Umax=6 V*				
1TMC06-050-15	2.65	1.3	74	4.3
1TMC06-050-12	2.35	1.6	74	5.3
1TMC06-050-10	2.15	1.9	74	6.2
1TMC06-050-08	1.95	2.3	74	7.6
1TMC06-050-05	1.65	3.5	73	11.6
1TMC06-050-03	1-1.4	5.8	71	19.8
1TMC06-060-XX *N=60 AxB = 10x12, CxB = 12x12, Umax=7.2 V*				
1TMC06-060-15	2.65	1.3	74	5.2
1TMC06-060-12	2.35	1.6	74	6.4
1TMC06-060-10	2.15	1.9	74	7.4
1TMC06-060-08	1.95	2.3	74	9.1
1TMC06-060-05	1.65	3.5	73	13.9
1TMC06-060-03	1-1.4	5.8	71	23.8
1TMC06-072-XX *N=72 AxB = 12x12, CxB = 14x12, Umax=8.6 V*				
1TMC06-072-15	2.65	1.3	74	6.2
1TMC06-072-12	2.35	1.6	74	7.7
1TMC06-072-10	2.15	1.9	74	8.9
1TMC06-072-08	1.95	2.3	74	10.9
1TMC06-072-05	1.65	3.5	73	16.7
1TMC06-072-03	1-1.4	5.8	71	28.6

TMC06 Series Single Stage – **Option**



Definitions

N Number of thermocouples
Th Hot side Temperature
Imax Current resulting in greatest ΔT
Umax Voltage at ΔTmax
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I = I max, ΔT=0)

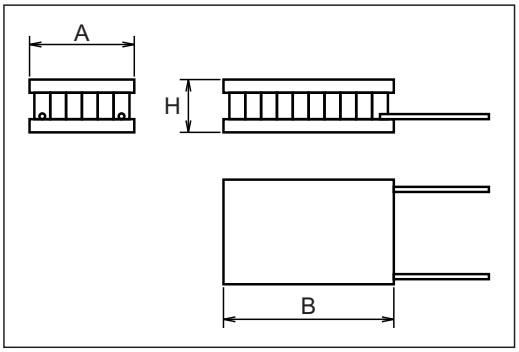
Notes

- Data shown are for Th=30°C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)
- Height can be varied on account of substrates thickness

TMC10 Sub-Series: Standard TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC10-030-XX *N=30 Top = Base = AxB = 12x12 Umax=3.6 V*				
1TMC10-030-20	4.1	2.7	74	5.44
1TMC10-030-15	3.6	3.5	74	7.17
1TMC10-030-12	3.3	4.3	74	8.83
1TMC10-030-10	3.1	5.2	74	10.3
1TMC10-030-08	2.9	6.3	74	12.8
1TMC10-030-05	2.6	9.6	73	19.4
1TMC10-048-XX *N=48 Top = Base = AxB = 15x15 Umax=5.8V*				
1TMC10-048-20	4.1	2.7	74	8.7
1TMC10-048-15	3.6	3.5	74	11.3
1TMC10-048-12	3.3	4.3	74	14
1TMC10-048-10	3.1	5.2	74	16.6
1TMC10-048-08	2.9	6.3	74	20.5
1TMC10-048-05	2.6	9.6	73	31
1TMC10-058-XX *N=58 Top = Base = AxB = 15x18 Umax=7 V*				
1TMC10-058-20	4.1	2.7	74	10.6
1TMC10-058-15	3.6	3.5	74	13.7
1TMC10-058-12	3.3	4.3	74	16.9
1TMC10-058-10	3.1	5.2	74	20.1
1TMC10-058-08	2.9	6.3	74	24.7
1TMC10-058-05	2.6	9.6	73	37.4

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TMC10-070-XX *N=70 Top = Base = AxB = 18x18 Umax = 8.4 V*				
1TMC10-070-20	4.1	2.7	74	12.7
1TMC10-070-15	3.6	3.5	74	16.5
1TMC10-070-12	3.3	4.3	74	20.4
1TMC10-070-10	3.1	5.2	74	24.2
1TMC10-070-08	2.9	6.3	74	29.8
1TMC10-070-05	2.6	9.6	73	45.1
1TMC10-096-XX *N=70 Top = Base = AxB = 21x21 Umax = 11.5 V*				
1TMC10-096-20	4.1	2.7	74	17.5
1TMC10-096-15	3.6	3.5	74	22.7
1TMC10-096-12	3.3	4.3	74	28
1TMC10-096-10	3.1	5.2	74	33.3
1TMC10-096-08	2.9	6.3	74	40.8
1TMC10-096-05	2.6	9.6	73	61.9



Definitions

N	Number of thermocouples
T_h	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔT_{max}
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max , ΔT=0)

Notes

- Data shown are for T_h=30^{O}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)
- Modules height can be varied on account of substrates thickness

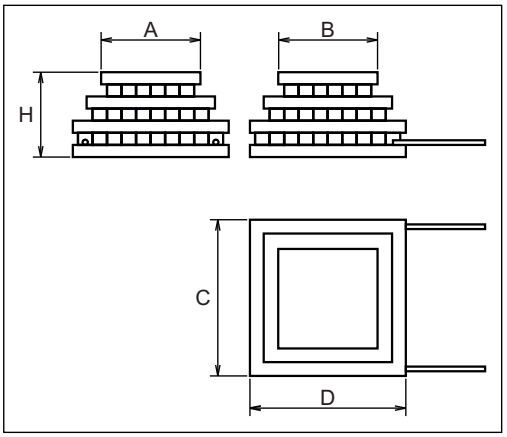
The TECs height can be reduced for account of substrates thickness

TMC04 Sub-Series: 2-stage TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC04-009-XX *NEW !*				
AxB: 2x2, CxD: 3.2x3.2		*Umax=0.8 V*		
2TMC04-009-15	4.7	0.46	103	0.09
2TMC04-009-12	4.1	0.57	103	0.11
2TMC04-009-10	3.7	0.68	102	0.13
2TMC04-009-08	3.3	0.85	101	0.16
2TMC04-009-05	2.7	1.27	99	0.25
2TMC04-021-XX				
AxB: 3.2x3.2, CxD: 4.8x4.8			*Umax=1.8 V*	
2TMC04-021-15	4.7	0.42	97	0.23
2TMC04-021-12	4.1	0.52	97	0.28
2TMC04-021-10	3.7	0.62	97	0.34
2TMC04-021-08	3.3	0.76	97	0.41
2TMC04-021-05	2.7	1.15	95	0.63
2TMC04-039-XX				
AxB: 4.8x4.8, CxD: 6.4x6.4			*Umax=3.5V*	
2TMC04-039-15	4.7	0.44	99	0.41
2TMC04-039-12	4.1	0.54	99	0.51
2TMC04-039-10	3.7	0.65	99	0.6
2TMC04-039-08	3.3	0.8	99	0.74
2TMC04-039-05	2.7	1.2	97	1.11
2TMC04-065-XX				
AxB: 4.8x4.8 , CxD: 8x8			*Umax=5.6 V*	
2TMC04-065-15	4.7	0.43	98	0.71
2TMC04-065-12	4.1	0.53	98	0.9
2TMC04-065-10	3.7	0.62	98	1.03
2TMC04-065-08	3.3	0.77	98	1.31
2TMC04-065-05	2.7	1.16	96	1.98

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC04-081-XX (Option **2TMC04-083-XX**)				
AxB: 6.4x6.4, CxD: 8x9.6 (Option 9.6x9.6) Umax=6.9 V				
2TMC04-081-15	4.7	0.42	97	0.95
2TMC04-081-12	4.1	0.52	97	1.19
2TMC04-081-10	3.7	0.61	97	1.38
2TMC04-081-08	3.3	0.75	97	1.70
2TMC04-081-05	2.7	1.15	95	2.57
2TMC04-093-XX				
AxB: 6.4x6.4, CxD: 9.6x9.6, Umax=8.1V				
2TMC04-093-15	4.7	0.44	100	0.98
2TMC04-093-12	4.1	0.54	100	1.21
2TMC04-093-10	3.7	0.64	100	1.44
2TMC04-093-08	3.3	0.8	100	1.75
2TMC04-093-05	2.7	1.2	98	2.66
2TMC04-101-XX				
AxB: 6.4x6.4, CxD: 9.6x9.6, Umax=8.2V				
2TMC04-101-15	4.7	0.44	95	1.14
2TMC04-101-12	4.1	0.54	95	1.41
2TMC04-101-10	3.7	0.64	95	1.67
2TMC04-101-08	3.3	0.8	95	2.04
2TMC04-101-05	2.7	1.2	93	3.1

TMC04 Series Multi – Stage



Definitions

N	Number of thermocouples
Th	Hot side Temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔT_{max}
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max, ΔT=0)

Notes

- Data shown are for Th=30°C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)
- Modules height can be varied on account of substrates thickness

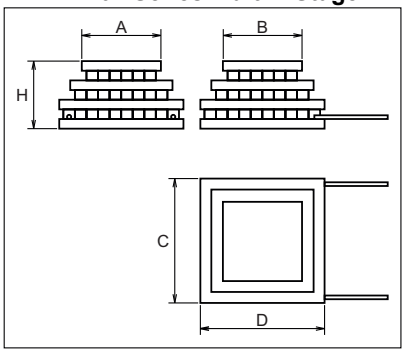
All series of TMC04 multi-stage modules is available with 0.3 mm long TE legs. This gives an advantage of 70% higher cooling capacity as compared with the most powerful standard TECs with TE leg length of 0.5 mm

TMC04 Sub-Series: 3-Stage and 4-Stage TECs

3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TMC04-024-XX *AxB: 2x2, CxD: 4.8x4.8*			***NEW !*** *Umax=1.7 V*	
3TMC04-024-15	6.8	0.37	116	0.09
3TMC04-024-12	5.9	0.47	116	0.12
3TMC04-024-10	5.3	0.56	115	0.14
3TMC04-024-08	4.7	0.68	115	0.17
3TMC04-024-05	3.8	1.07	112	0.26
3TMC04-026-XX *AxB: 2x3.2, CxD: 4.8x4.8*			***NEW !*** *Umax=1.75 V*	
3TMC04-026-15	6.8	0.35	112	0.12
3TMC04-026-12	5.9	0.44	112	0.15
3TMC04-026-10	5.3	0.52	111	0.18
3TMC04-026-08	4.7	0.64	111	0.22
3TMC04-026-05	3.8	0.99	108	0.35
3TMC06-038-XX *AxB = 2x3.2, CxD = 4.8x8.4,*			***NEW !*** *Umax=2.6 V*	
3TMC04-038-15	6.8	0.36	113	0.17
3TMC04-038-12	5.9	0.44	113	0.21
3TMC04-038-10	5.3	0.53	112	0.25
3TMC04-038-08	4.7	0.67	111	0.31
3TMC04-038-05	3.8	1.02	109	0.47
3TMC06-044-XX *AxB = 2x3.2, CxD = 6.4x6.4,*			***NEW !*** *Umax=3.2 V*	
3TMC04-044-15	6.8	0.38	116	0.18
3TMC04-044-12	5.9	0.47	116	0.22
3TMC04-044-10	5.3	0.58	115	0.26
3TMC04-044-08	4.7	0.69	115	0.32
3TMC04-044-05	3.8	1.04	112	0,5
3TMC04-070-XX *AxB: 3.2x3.2, CxD: 8x8*			*Umax=5.3 V*	
3TMC04-070-15	6.8	0.38	116	0.27
3TMC04-070-12	5.9	0.47	116	0.33
3TMC04-070-10	5.3	0.56	116	0.39
3TMC04-070-08	4.7	0.68	116	0.48
3TMC04-070-05	3.8	1.04	114	0.73

TMC04 Series Multi – Stage



All series of TMC04 multi-stage modules is available with 0.3 mm long TE legs what gives an advantage of 70% increase in cooling power

3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TMC04-88-XX *AxB: 3.2x3,2 (3.2x4.8), CxD: 8x9.6*			*Umax=6.5 V*	
3TMC04-088-15	6.8	0.38	115	0.35
3TMC04-088-12	5.9	0.46	115	0.43
3TMC04-088-10	5.3	0.55	115	0.51
3TMC04-088-08	4.7	0.67	115	0.63
3TMC04-088-05	3.8	1.03	113	0.96
3TMC04-090-XX *AxB: 4.8x4.8 CxD: 8x9.6*			*Umax=6.4V*	
3TMC04-090-15	6.8	0.39	118	0.37
3TMC04-090-12	5.9	0.48	118	0.46
3TMC04-090-10	5.3	0.58	118	0.55
3TMC04-090-08	4.7	0.71	117	0.67
3TMC04-090-05	3.8	1.11	115	1.04
3TMC04-106-XX *AxB: 4.8x4.8 CxD: 9.6x9.6*			***NEW !*** *Umax=7.8V*	
3TMC04-106-15	6.8	0.38	116	0.44
3TMC04-106-12	5.9	0.47	116	0.55
3TMC04-106-10	5.3	0.56	115	0.65
3TMC04-106-08	4.7	0.69	114	0.8
3TMC04-106-05	3.8	1.08	112	1.24
3TMC04-112-XX *AxB: 4.8x4.8, CxD: 9.6x9.6 Umax=8V*				
3TMC04-112-15	6.8	0.36	113	0.49
3TMC04-112-12	5.9	0.44	113	0.61
3TMC04-112-10	5.3	0.53	113	0.72
3TMC04-112-08	4.7	0.65	113	0.9
3TMC04-112-05	3.8	0.98	110	1.36

4-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
4TMC06-121-XX *AxB = 3.2x3.2, CxD = 9.6x9.6,*			***NEW !*** *Umax=7.3V*	
4TMC06-121-15	6.7	0.31	123	0.25
4TMC06-121-12	7.5	0.4	123	0.32
4TMC06-121-10	6.7	0.47	123	0.38
4TMC06-121-08	5.9	0.58	122	0.46
4TMC06-121-05	4.7	0.89	120	0.72

Definitions

N Number of thermocouples
T_h Hot side Temperature
Imax Current resulting in greatest ΔT
Umax Voltage at ΔT_{max}
ΔT_{max} Maximum temperature difference
Qmax Maximum cooling power (I = I max, ΔT=0)

Notes

- Data shown are for T_h=30°C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax $(1-\Delta T/\Delta T_{max})$

TMC06 Sub-Series: 2-Stage TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC06-009-XX *AxB = 2.5x2.5, CxD = 4x4 Umax=0.82 V*				
2TMC06-009-15	4.7	1	101	0.2
2TMC06-009-12	4.1	1.3	101	0.24
2TMC06-009-10	3.7	1.5	101	0.29
2TMC06-009-08	3.3	1.8	101	0.35
2TMC06-009-05	2.7	2.8	100	0.54
2TMC06-010-XX *AxB = 3.2x3.2, CxD = 4x4 Umax=0.82 V*				
2TMC06-010-15	4.7	0.9	95	0.25
2TMC06-010-12	4.1	1.1	95	0.31
2TMC06-010-10	3.7	1.3	95	0.37
2TMC06-010-08	3.3	1.6	95	0.45
2TMC06-010-05	2.7	2.5	94	0.68
2TMC06-021-XX MOD *AxB = 4x4, CxD = 6x6, Umax=1.8 V*				
2TMC06-021-15	4.7	0.9	97	0.52
2TMC06-021-12	4.1	1.2	97	0.64
2TMC06-021-10	3.7	1.4	97	0.77
2TMC06-021-08	3.3	1.7	97	0.92
2TMC06-021-05	2.7	2.6	96	1.41
2TMC06-041-XX *AxB = 6x6, CxD = 8x8 Umax= 3.4 V*				
2TMC06-041-15	4.7	0.9	98	1.04
2TMC06-041-12	4.1	1.2	97	1.29
2TMC06-041-10	3.7	1.4	97	1.53
2TMC06-041-08	3.3	1.7	96	1.95
2TMC06-041-05	2.7	2.7	94	2.92

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC06-065-XX *AxB = 6x6 , CxD = 10x10 Umax= 5.6 V*				
2TMC06-065-15	4.7	1	98	1.6
2TMC06-065-12	4.1	1.2	98	1.96
2TMC06-065-10	3.7	1.4	98	2.32
2TMC06-065-08	3.3	1.7	98	2.96
2TMC06-065-05	2.7	2.6	96	4.32
2TMC06-081-XX (Option **2TMC06-083-XX**) *AxB = 8x8, CxD = 10x12 (Option 12x12), Umax=6.8 V*				
2TMC06-081-15	4.7	0.9	96	2
2TMC06-081-12	4.1	1.1	96	2.5
2TMC06-081-10	3.7	1.3	96	2.95
2TMC06-081-08	3.3	1.7	96	3.63
2TMC06-081-05	2.7	2.6	94	5.5
2TMC06-093-XX *AxB = 8x8, CxD = 12x12 Umax= 8.2 V*				
2TMC06-093-15	4.7	1	100	2.21
2TMC06-093-12	4.1	1.2	100	2.71
2TMC06-093-10	3.7	1.4	100	3.23
2TMC06-093-08	3.3	1.8	100	3.97
2TMC06-093-05	2.7	2.7	98	5.99
2TMC06-101-XX *AxB = 8x8, CxD = 12x12 Umax= 8.2 V*				
2TMC06-101-15	4.7	0.9	95	2.56
2TMC06-101-12	4.1	1.1	95	3.15
2TMC06-101-10	3.7	1.3	95	3.73
2TMC06-101-08	3.3	1.6	95	4.58
2TMC06-101-05	2.7	2.5	93	6.96

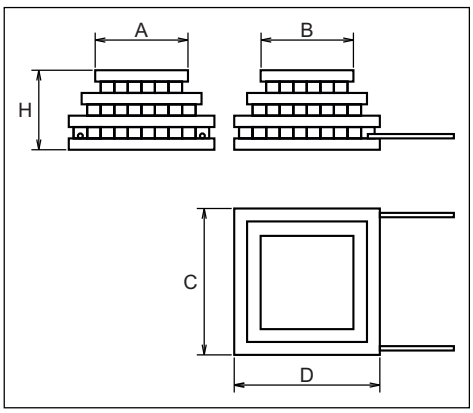
Definitions

T_h Hot side temperature
I_{max} Current resulting in greatest ΔT
U_{max} Voltage at ΔT_{max}
ΔT_{max} Maximum temperature difference
Q_{max} Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

Notes

- All dimensions are given in mm
- Data shown are for $T_h=30^oC$
- Q_{max} rated at $\Delta T=0$, at other ΔT cooling power should be defined as $Q=Q_{max}(1-\Delta T/\Delta T_{max})$
- Options are given in brackets

TMC06 Series Multi-Stage



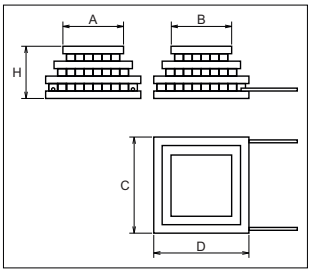
All series of TMC06 multi-stage modules is available with 0.3 mm long TE legs. This gives an advantage of 70% higher cooling capacity as compared with the most powerful standard TECs with TE leg length of 0.5 mm

TMC06 Sub-Series: 3-Stage and 4-Stage TECs

3-Stage

Model	H (mm)	Imax (A)	ΔTmax (K)	Qmax (W)
3TMC06-024-XX *AxB = 2.5x2.5, CxD = 6x6, Umax=1.8V*				
3TMC06-024-15	6.8	0.8	115	0.2
3TMC06-024-12	5.9	1	115	0.25
3TMC06-024-10	5.3	1.2	115	0.3
3TMC06-024-08	4,7	1.5	115	037
3TMC06-024-05	3.8	2.3	113	0.56
3TMC06-026-XX *NEW !* *AxB = 3.2x3.2, CxD = 6x6, Umax=1.8V*				
3TMC06-026-15	6.8	0.8	112	0.28
3TMC06-026-12	5.9	1	112	0.33
3TMC06-026-10	5.3	1.2	111	0.4
3TMC06-026-08	4,7	1.45	111	0.49
3TMC06-026-05	3.8	2.25	108	0.76
3TMC06-038-XX *NEW !* *AxB = 2x4, CxD = 6x8, Umax=2.6 V*				
3TMC06-038-15	6.8	0.8	113	0.38
3TMC06-038-12	5.9	1	113	0.47
3TMC06-038-10	5.3	1.2	112	0.56
3TMC06-038-08	4,7	1.5	111	0.69
3TMC06-038-05	3.8	2.3	109	1.07
3TMC06-044-XX *NEW !* *AxB = 2x4, CxD = 8x8, Umax=3.2 V*				
3TMC06-044-15	6.8	0.85	116	0.4
3TMC06-044-12	5.9	1.05	116	0.5
3TMC06-044-10	5.3	1.3	115	0.59
3TMC06-044-08	4,7	1.55	115	0.73
3TMC06-044-05	3.8	2.35	112	1.12
3TMC06-070-XX *AxB = 4x4, CxD = 10x10 Umax =5.3 V*				
3TMC06-070-15	6.8	0.9	116	0.6
3TMC06-070-12	5.9	1	116	074
3TMC06-070-10	5.3	1.2	116	0.88
3TMC06-070-08	4,7	1.5	116	1,08
3TMC06-070-05	3.8	2.3	114	1.64
3TMC06-088-XX *AxB = 4x6 (6x6), CxD = 10x12 Umax=6.4V*				
3TMC06-088-15	6.8	0.8	115	0.79
3TMC06-088-12	5.9	1	115	098
3TMC06-088-10	5.3	1.2	115	1.15
3TMC06-088-08	4,7	1.5	115	1,42
3TMC06-088-05	3.8	2.3	113	2.15

TMC06 Series Multi-Stage



3-Stage

Model	H (mm)	Imax (A)	ΔTmax (K)	Qmax (W)
3TMC06-090-XX *AxB = 6x6, CxD = 10x12 Umax=6.4 V*				
3TMC06-090-15	6.8	0.8	112	0.89
3TMC06-090-12	5.9	1	112	1.11
3TMC06-090-10	5.3	1.2	112	1.31
3TMC06-090-08	4,7	1.4	112	1,61
3TMC06-090-05	3.8	2.2	110	2.43
3TMC06-106-XX *NEW !* *AxB = 6x6, CxD = 12x12 Umax=7.7 V*				
3TMC06-106-15	6.8	0.85	116	0.99
3TMC06-106-12	5.9	1.05	115	1.22
3TMC06-106-10	5.3	1.25	115	1.46
3TMC06-106-08	4,7	1.55	114	1,8
3TMC06-106-05	3.8	2.35	112	2.76
3TMC06-112-XX *AxB = 4x6 (6x6), CxD = 12x12 Umax=7.8 V*				
3TMC06-112-15	6.8	0.8	113	1.1
3TMC06-112-12	5.9	1	113	1.37
3TMC06-112-10	5.3	1.1	113	1.61
3TMC06-112-08	4,7	1.4	112	2
3TMC06-112-05	3.8	2.2	110	3

4-Stage

Model	H (mm)	Imax (A)	ΔTmax (K)	Qmax (W)
4TMC06-115-XX *NEW !* *AxB = 2x4, CxD = 12x12, Umax=7.6V*				
4TMC06-115-15	8.7	0.8	129	0.43
4TMC06-115-12	7.5	1	128	0.54
4TMC06-115-10	6.7	1.1	128	0.63
4TMC06-115-08	5.9	1.4	127	0.78
4TMC06-115-05	4.7	2.2	125	1.21
4TMC06-121-XX *NEW !* *AxB = 4x4, CxD = 12x12, Umax=7.3V*				
4TMC06-121-15	8.7	0.7	123	0.57
4TMC06-121-12	7.5	0.9	123	0.72
4TMC06-121-10	6.7	1	123	0.85
4TMC06-121-08	5.9	1.3	122	1.05
4TMC06-121-05	4.7	2	120	1.61

Definitions

T_h Hot side temperature

I_{max} Current resulting in greatest ΔT

U_{max} Voltage at ΔT_{max}

ΔT_{max} Maximum temperature difference

Q_{max} Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

Notes

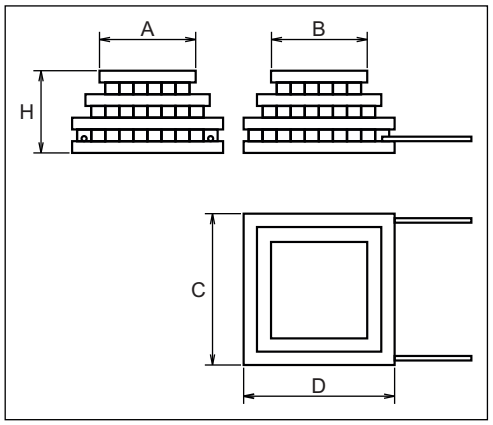
- All dimensions are given in mm
- Data shown are for $T_h=30^oC$
- Q_{max} rated at $\Delta T=0$, at other ΔT cooling power should be defined as $Q=Q_{max}(1-\Delta T/\Delta T_{max})$

TMC10 Sub-Series: 2-Stage TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC10-065-XX *AxB = 9x9, CxD = 15x15*			U_{max}= 5.6 V	
2TMC10-065-20	7.1	2.1	99	3.41
2TMC10-065-15	6.1	2.7	99	5.49
2TMC10-065-12	5.5	3.4	99	5.58
2TMC10-065-10	5.1	4	98	6.62
2TMC10-065-08	4.7	5	97	8.19
2TMC10-065-05	4.1	7.7	95	13.1
2TMC10-081-XX *AxB = 12x12, CxD = 15x18*			U_{max}= 6.8 V	
2TMC10-081-20	7.1	2	97	4.35
2TMC10-081-15	6.1	2.6	97	5.65
2TMC10-081-12	5.5	3.2	97	6.93
2TMC10-081-10	5.1	3.7	97	8.16
2TMC10-081-08	4.7	4.7	96	10.1
2TMC10-081-05	4.1	7.5	94	16.1
2TMC10-093-XX *AxB = 12x12, CxD = 18x18*			U_{max}= 8.2 V	
2TMC10-093-20	7.1	2.1	101	4.72
2TMC10-093-15	6.1	2.7	101	6.12
2TMC10-093-12	5.5	3.4	101	7.57
2TMC10-093-10	5.1	4	100	8.95
2TMC10-093-08	4.7	4.9	100	11
2TMC10-093-05	4.1	7.8	97	17.6

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TMC10-101-XX *AxB = 12x12, CxD = 18x18*			U_{max}= 8.2 V	
2TMC10-101-20	7.1	1.9	96	5.46
2TMC10-101-15	6.1	2.5	96	7.1
2TMC10-101-12	5.5	3.1	96	8.77
2TMC10-101-10	5.1	3.6	95	10.4
2TMC10-101-08	4.7	4.5	94	12.8
2TMC10-101-05	4.1	7.3	92	20.4
2TMC10-135-XX *AxB = 15x15, CxD = 21x21*			U_{max}= 11.3 V	
2TMC10-135-20	7.1	2	97	7.22
2TMC10-135-15	6.1	2.6	97	9.55
2TMC10-135-12	5.5	3.2	97	11.6
2TMC10-135-10	5.1	3.7	96	13.7
2TMC10-135-08	4.7	4.7	96	16.8
2TMC10-135-05	4.1	7.5	94	26.8

TMC10 Series Multi – Stage



Definitions

N	Number of thermocouples
Th	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I=Imax, ΔT=0)

Notes

- Dimensions are given in mm
- Data shown are for Th=30°C
- Q_{max} is rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax(1-ΔT/ΔTmax)

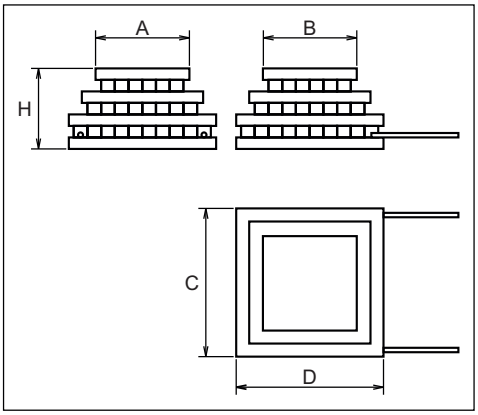
**** Heights can be varied to specification on account of substrates thickness***

TMC10 Sub-Series: 3-Stage TEC

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TMC10-070-XX *AxB = 6x6 CxD = 15x15*			*NEW ! U_{max}=5.2 V*	
3TMC10-070-20	10.2	1.8	118	1.28
3TMC10-070-15	8.8	2.4	118	1.7
3TMC10-070-12	7.9	3	117	2.12
3TMC10-070-10	7.3	3.5	117	2.5
3TMC10-070-08	6.7	4.4	116	3.1
3TMC10-070-05	5.7	6.8	114	4.8
3TMC10-088-XX *AxB = 9x9 CxD = 15x18*			*U_{max}= 6.5 V*	
3TMC10-088-20	10.2	1.8	116	1.7
3TMC10-088-15	8.8	2.3	116	2.2
3TMC10-088-12	7.9	2.9	116	2.71
3TMC10-088-10	7.3	3.4	116	3.22
3TMC10-088-08	6.7	4.1	115	3.93
3TMC10-088-05	5.7	6.6	113	6.28
3TMC10-100-XX *AxB= 6x9 CxD= 18x18*			*NEW ! U_{max}= 7.6 V*	
3TMC10-100-20	10.2	1.9	119	1.76
3TMC10-100-15	8.8	2.4	119	2.31
3TMC10-100-12	7.9	3	118	2.87
3TMC10-100-10	7.3	3.6	118	3.42
3TMC10-100-08	6.7	4.4	117	4.21
3TMC10-100-05	5.7	6.9	115	6.52

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TMC10-112-XX *AxB= 6x9 (9x9 available) CxD= 18x18,*			*U_{max}= 7.9 V*	
3TMC10-112-20	10.2	1.7	113	2.4
3TMC10-112-15	8.8	2.2	113	3.1
3TMC10-112-12	7.9	2.7	113	3.8
3TMC10-112-10	7.3	3.2	113	4.5
3TMC10-112-08	6.7	4	112	5.5
3TMC10-112-05	5.7	6.5	110	8.8
3TMC10-150-XX *AxB= 9x9 (12x12) CxD= 21x21,*			*NEW ! U_{max}= 10.5 V*	
3TMC10-150-20	10.2	1.7	114	3.15
3TMC10-150-15	8.8	2.2	114	4.13
3TMC10-150-12	7.9	2.8	113	5.13
3TMC10-150-10	7.3	3.3	113	6.11
3TMC10-150-08	6.7	4	112	7.5
3TMC10-150-05	5.7	6.3	110	11.6
3TMC10-168-XX *AxB= 12x12 CxD= 21x21,*			*U_{max}= 10.7 V*	
3TMC10-168-20	10.2	1.5	108	4.04
3TMC10-168-15	8.8	2.0	108	5.23
3TMC10-168-12	7.9	2.5	108	6.46
3TMC10-168-10	7.3	3	108	7.64
3TMC10-168-08	6.7	3.6	107	9.36
3TMC10-168-05	5.7	5.4	104	14

TMC10 Series Multi – Stage



Definitions

N	Number of thermocouples
Th	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔT_{max}
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I=Imax, ΔT=0)

Notes

- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)

**** Heights can be varied to the specification on account of substrates thickness***

TMC10 Sub-Series: 4-Stage and 5-Stage TECs

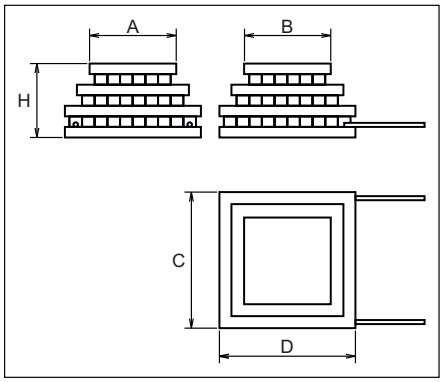
4-Stage

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
4TMC10-121-XX *AxB = 6x6, CxD = 18x18*			*NEW ! U_{max}= 7.4 V*	
4TMC10-121-20	13.2	1.5	124	1.21
4TMC10-121-15	11.2	2.0	124	1.6
4TMC10-121-12	10	2.5	123	2
4TMC10-121-10	9.2	2.9	123	2.36
4TMC10-121-08	8.4	3.6	122	2.91
4TMC10-121-05	7.2	5.7	120	4.5
4TMC10-155-XX *AxB = 6x6, CxD = 21x21*			*NEW ! U_{max}= 10.2 V*	
4TMC10-155-20	13.2	1.6	128	1.29
4TMC10-155-15	11.2	2.1	128	1.71
4TMC10-155-12	10	2.6	127	2.12
4TMC10-155-10	9.2	3.1	127	2.53
4TMC10-155-08	8.4	3.9	126	3.13
4TMC10-155-05	7.2	6.1	124	4.85
4TMC10-177-XX *AxB = 6x9 (9x9 available), CxD = 21x21,*			*NEW ! U_{max}= 10.4 V*	
4TMC10-177-20	13.2	1.4	122	1.91
4TMC10-177-15	11.2	1.9	122	2.51
4TMC10-177-12	10	2.4	121	3.13
4TMC10-177-10	9.2	2.8	120	3.73
4TMC10-177-08	8.4	3.5	120	4.61
4TMC10-177-05	7.2	5.5	117	7.12

5-Stage

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
5TMC10-183-XX *AxB = 6x6, CxD = 21x21*			*NEW ! U_{max}= 9.9 V*	
5TMC10-183-20	16.2	1.35	131	0.96
5TMC10-183-15	13.7	1.8	131	1.28
5TMC10-183-12	12.2	2.2	130	1.58
5TMC10-183-10	11.2	2.65	130	1.88
5TMC10-183-08	10.2	3.2	129	2.31
5TMC10-183-05	8.7	5.1	127	3.59

TMC10 Series Multi – Stage



Notes

- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)

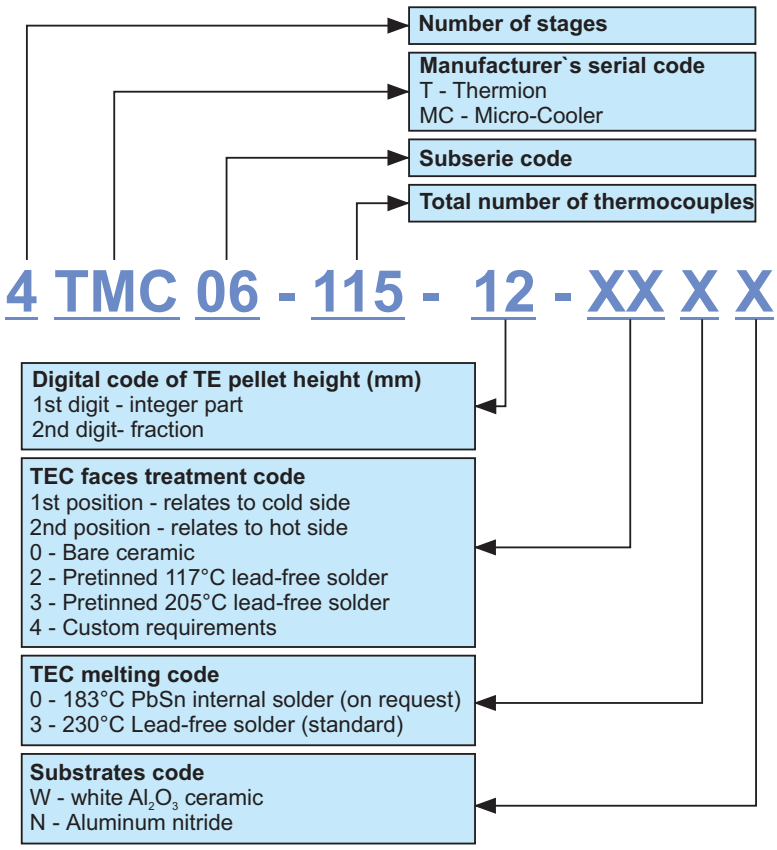
Definitions

N	Number of thermocouples
Th	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
$\Delta T max_X$	Maximum temperature difference
Qmax	Maximum cooling power (I=Imax, ΔT=0)

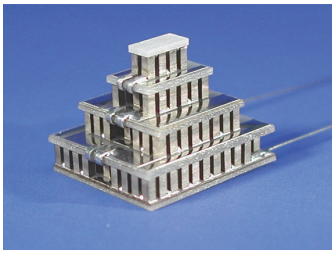
**** Heights can be varied to the specification on account of substrates thickness***

Designator Decoding

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This part numbering system is unique to Thermion Services and forms part of our intellectual property



4TMC06-115-12-023N

Standard height tolerances (mm)

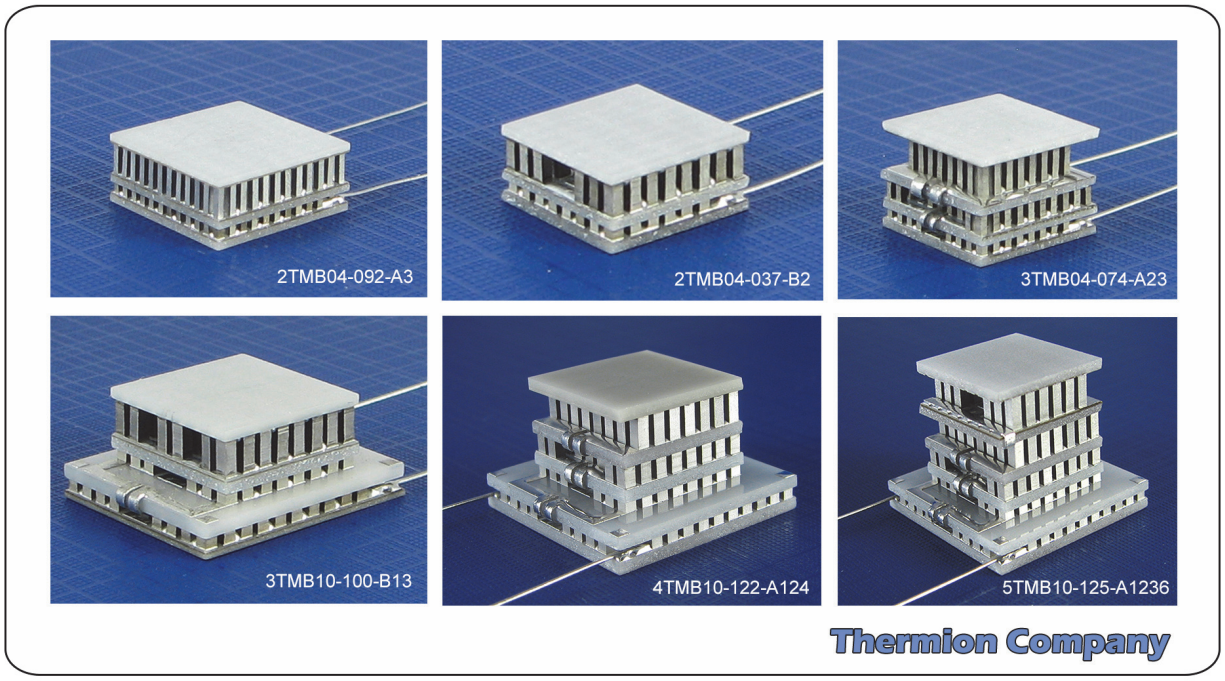
±0.1 for 1 stage
±0.15 for 2 stage
±0.2 for 3 stage
±0.3 for 4 stage
±0.4 for 5 stage

Special tolerances can be provided on request

If you are not sure what TE cooler should be selected or you need custom made device designed to specifications, please address directly to Thermion Company. Our specialists will be glad to assist you in choosing / working out TEC meeting your demands with minimal power consumptions.

Features of TMB-Series multi-StageTECs

This Thermion series is designed specially for cooling CCDs, multi-element matrixes of IR detectors, focal plain arrays and other planar optoelectronic elements which have relatively large surface and require low temperatures for their operation. Over 250 cascade configurations having identical or near identical top and bottom dimensions are available now. Despite the increased cold side area, these coolers provide an even greater temperature drop than traditional "pyramidal" cascade TECs. This Thermion's series is permanently supplemented with new advanced configurations in response to the most refined customer's needs. Such are the TECs 2TMB04-042-C2, 2TMB04-066-A2, 2TMB04-092-A3, 5TMB06-113-A1224, 5TMB10-164-B2224, 5TMB10-183-A1123 and many others.

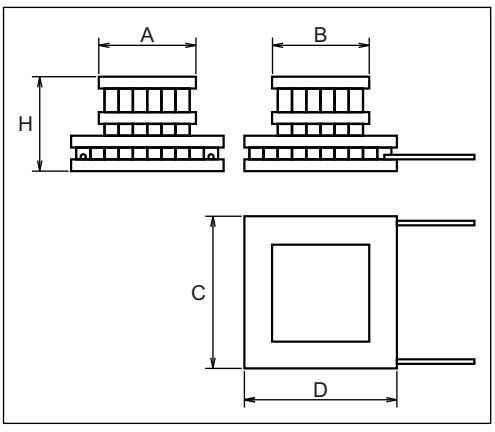


TMB04 Sub-Series: 2-Stage TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB04-010-X2 *AxB = 3.2x3.2, CxD = 3.2x3.2, Umax=0.85 V*				
2 TMB04-010-C2	4.7	0.64	97	0.17
2 TMB04-010-B2	4.0	0.8	97	0.22
2 TMB04-010-A2	3.2	1.2	96	0.32
2 TMB04-014-X2 ***NEW !*** *AxB = 3x3, CxD = 3x3, Umax=1.3 V*				
2 TMB04-014-C2	4.7	0.7	104	0.21
2 TMB04-014-B2	4.0	0.9	104	0.27
2 TMB04-014-A2	3.2	1.35	103	0.4
2 TMB04-019-X2 *AxB = 3.2x3.2 (4.8x4.8), CxD =4.8x4.8 Umax=1.8 V*				
2 TMB04-019-B2	4.7	0.7	104	0.28
2 TMB04-019-B2	4.0	0.88	104	0.35
2 TMB04-019-A2	3.2	1.3	103	0.52
2 TMB04-021-X2 *AxB = 4.8x4.8, CxD = 4.8x4.8, Umax=1.85 V*				
2 TMB04-021-C2	4.7	0.65	98	0.35
2 TMB04-021-B2	4.0	0.82	98	0.45
2 TMB04-021-A2	3.2	1.2	97	0.67
2 TMB04-029-X3 ***NEW !*** *AxB = 6.4x6.4, CxD = 6.4x6.4, Umax=2.5 V*				
2 TMB04-029-B3	5	0.8	99	0.61
2 TMB04-029-A3	3.7	1.28	98	0.95
2 TMB04-034-X2 *AxB = 6.4x6.4 (8x8), CxD = 6.4x6.4 (8x8), Umax=2.75 V*				
2 TMB04-034-C2	4.7	0.6	95	0.59
2 TMB04-034-B2	4.0	0.78	95	0.77
2 TMB04-034-A2	3.2	1.2	94	1.16
2 TMB04-037-X3 *AxB = 6.4x6.4, CxD = 6.4x6.4 Umax=3.5 V*				
2 TMB04-037-B3	5	0.85	104	0.66
2 TMB04-037-A3	3.7	1.35	103	1.05
2 TMB04-040-X2 ***NEW !*** *AxB =4.8x4.8 (6.4x6.4), CxD = 6.4x6.4, Umax=3.6 V*				
2 TMB04-040-C2	4.7	0.69	103	0.6
2 TMB04-040-B2	4.0	0.88	103	0.79
2 TMB04-040-A2	3.2	1.34	102	1.18

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB04-042-X2 ***NEW !*** *AxB = 8x8, CxD = 8x8, Umax=3.7 V*				
2 TMB04-042-C2	4.7	0.66	101	0.69
2 TMB04-042-B2	4.0	0.84	100	0.89
2 TMB04-042-A2	3.2	1.28	99	1.33
2 TMB04-044-X2 ***NEW !*** *AxB = 8x8, CxD = 8x8, Umax=3.7 V*				
2 TMB04-044-C2	4.7	0.64	98	0.75
2 TMB04-044-B2	4.0	0.81	97	0.97
2 TMB04-044-A2	3.2	1.24	96	1.46
2 TMB04-047-X3 *AxB = 6.4x8, CxD = 6.4x8 Umax=4.5 V*				
2 TMB04-047-B3	5	0.86	104	083
2 TMB04-047-A3	3.7	1.32	103	1.32
2 TMB04-066-X2 *AxB = 8x8, CxD = 8x8, Umax=5.7 V*				
2 TMB04-066-C2	4.7	0.65	98	1.12
2 TMB04-066-B2	4.0	0.8	98	1.42
2 TMB04-066-A2	3.2	1.2	97	2.1
2 TMB04-080-X2 *AxB = 8x9.6, CxD = 8x9.6, Umax=6.9 V*				
2 TMB04-080-C2	4.7	0.64	98	1.4
2 TMB04-080-B2	4.0	0.8	98	1.72
2 TMB04-080-A2	3.2	1.2	97	2.55
2 TMB04-092-X2 *AxB = 9.6x9.6, CxD = 9.6x9.6, Umax=8.4 V*				
2 TMB04-092-C2	4.7	0.68	101	1.47
2 TMB04-092-B2	4.0	0.84	101	1.87
2 TMB04-092-A2	3.2	1.28	100	2.78
2 TMB04-092-X3 *AxB = 9.6x9.6, CxD = 9.6x9.6, Umax=8.4 V*				
2 TMB04-092-B3	5	0.82	101	1.77
2 TMB04-092-A3	3.7	1.34	100	2.9

TMB Series Multi-stage



Definitions

Th Hot side temperature
Imax Current resulting in greatest Δ
Umax Voltage at ΔTmx
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I=Imax, ΔT=0)

Notes

- Data shown are for Th=30°C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)

TMB04 Sub-Series TECs: 3 to 5 Stages

3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TMB04-038-X12 *AxB = 3.2x3.2, CxD =4.8x6.4,*			*Umax=2.7 V*	
3 TMB04-038-C12	6.2	0.56	113	0.26
3 TMB04-038-B12	5.4	0.69	113	0.33
3 TMB04-038-A12	4.3	1	111	0.5
3 TMB04-044-X12 *AxB = 3.2x3.2, CxD =6.4x6.4,*			*Umax=3.3 V*	
3 TMB04-044-C12	6.2	0.56	116	0.27
3 TMB04-044-B12	5.4	0.7	116	0.34
3 TMB04-044-A12	4.3	1.08	115	0.5
3 TMB04-070-X12 *AxB =6.4x6.4, CxD = 8x8,*			*Umax=5.3 V*	***NEW !***
3 TMB04-070-C12	6.2	0.58	118	0.41
3 TMB04-070-B12	5.4	0.73	117	0.52
3 TMB04-070-A12	4.3	1.12	116	0.8
3 TMB04-074-X23 *AxB =6.4x6.4, CxD = 8x8,*			*Umax=5.4 V*	
3 TMB04-074-B23	7	0.68	114	0.61
3 TMB04-074-A23	5.3	1.06	113	0.96
3 TMB04-088-X13 *AxB = 6.4x6.4, CxD = 8x9.6,*			*Umax=6.6 V*	
3 TMB04-088-B13	6.3	0.7	116	0.65
3 TMB04-088-A13	4.8	1.05	115	1.02
3 TMB04-100-X13 *AxB = 6.4x6.4, CxD = 9.6x9.6,*			*Umax=7.8 V*	
3 TMB04-100-B13	6.3	0.7	118	0.67
3 TMB04-100-A13	4.8	1.1	117	1.07
3 TMB04-107-X12 *AxB = 6.4x6.4, CxD =9.6X9.6,*			*Umax=7.8 V*	
3 TMB04-107-C12	6.2	0.53	115	0.7
3 TMB04-107-B12	5.4	0.67	114	0.89
3 TMB04-107-A12	4.3	1.1	113	1.38

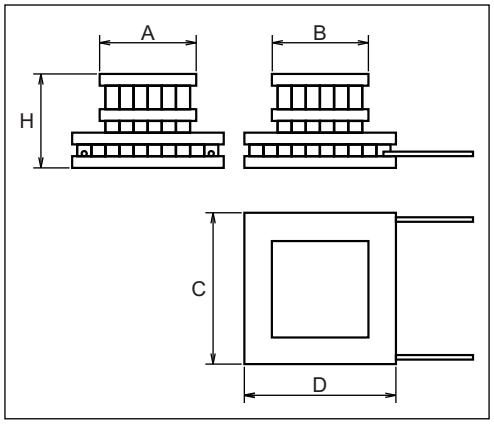
4-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
4 TMB04-115-X123 *AxB = 4.8x4.8, CxD = 9.6x9.6 (8x8 available),*			*Umax=7.5 V*	***NEW !***
4 TMB04-115-B123	8.3	0.64	129	0.35
4 TMB04-115-A123	6.3	0.98	127	0.56
4 TMB04-118-X123 *AxB = 4.8x4.8, CxD = 9.6x9.6 (8x8 available),*			*Umax=7.5 V*	***NEW !***
4 TMB04-118-B123	8.3	0.63	126	0.42
4 TMB04-118-A123	6.3	0.96	125	0.66
4 TMB04-121-X122 *AxB = 4.8x4.8, CxD = 9.6X9.6,*			*Umax=7.6 V*	
4 TMB04-121-C122	8.8	0.48	123	0.39
4 TMB04-121-B122	7.5	0.61	123	0.5
4 TMB04-121-A122	5.8	0.9	122	0.73
4 TMB04-121-X123 *AxB = 4.8x4.8 (6.4x6.4), CxD = 9.6X9.6,*			*Umax=7.6 V*	
4 TMB04-121-B123	8.3	0.6	124	0.47
4 TMB04-121-A123	6.3	0.91	123	0.74

5-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
5 TMB04-125-X1224 *AxB = 4.8x4.8, CxD = 9.6X9.6*			*Umax=7.2 V*	***NEW !***
5 TMB04-125-B1224	11.2	0.58	133	0.26
5 TMB04-125-A1224	8.3	8.4	132	0.37

TMB Series Multi-stage



Definitions

T_h	Hot side temperature
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔT_{max}
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I=Imax, ΔT=0)

Notes

- All dimentions are given in mm
- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)

TMB06 Sub-Series: 2-Stage TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB04-010-X2 *AxB = 3.2x3.2, CxD = 3.2x3.2,* *Umax=0.85 V*				
2 TMB04-010-C2	4.7	0.64	97	0.17
2 TMB04-010-B2	4.0	0.8	97	0.22
2 TMB04-010-A2	3.2	1.2	96	0.32
2 TMB04-014-X2 ***NEW !*** *AxB = 3x3, CxD = 3x3,* *Umax=1.3 V*				
2 TMB04-014-C2	4.7	0.7	104	0.21
2 TMB04-014-B2	4.0	0.9	104	0.27
2 TMB04-014-A2	3.2	1.35	103	0.4
2 TMB04-019-X2 *AxB = 3.2x3.2 (4.8x4.8), CxD =4.8x4.8* *Umax=1.8 V*				
2 TMB04-019-B2	4.7	0.7	104	0.28
2 TMB04-019-B2	4.0	0.88	104	0.35
2 TMB04-019-A2	3.2	1.3	103	0.52
2 TMB04-021-X2 *AxB = 4.8x4.8, CxD = 4.8x4.8,* *Umax=1.85 V*				
2 TMB04-021-C2	4.7	0.65	98	0.35
2 TMB04-021-B2	4.0	0.82	98	0.45
2 TMB04-021-A2	3.2	1.2	97	0.67
2 TMB04-029-X3 ***NEW !*** *AxB = 6.4x6.4, CxD = 6.4x6.4,* *Umax=2.5 V*				
2 TMB04-029-B3	5	0.8	99	0.61
2 TMB04-029-A3	3.7	1.28	98	0.95
2 TMB04-034-X2 *AxB = 6.4x6.4 (8x8), CxD = 6.4x6.4 (8x8),* *Umax=2.75 V*				
2 TMB04-034-C2	4.7	0.6	95	0.59
2 TMB04-034-B2	4.0	0.78	95	0.77
2 TMB04-034-A2	3.2	1.2	94	1.16
2 TMB04-037-X3 *AxB = 6.4x6.4, CxD = 6.4x6.4* *Umax=3.5 V*				
2 TMB04-037-B3	5	0.85	104	0.66
2 TMB04-037-A3	3.7	1.35	103	1.05
2 TMB04-040-X2 ***NEW !*** *AxB =4.8x4.8 (6.4x6.4), CxD = 6.4x6.4,* *Umax=3.6 V*				
2 TMB04-040-C2	4.7	0.69	103	0.6
2 TMB04-040-B2	4.0	0.88	103	0.79
2 TMB04-040-A2	3.2	1.34	102	1.18

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB04-042-X2 ***NEW !*** *AxB = 8x8, CxD = 8x8,* *Umax=3.7 V*				
2 TMB04-042-C2	4.7	0.66	101	0.69
2 TMB04-042-B2	4.0	0.84	100	0.89
2 TMB04-042-A2	3.2	1.28	99	1.33
2 TMB04-044-X2 ***NEW !*** *AxB = 8x8, CxD = 8x8,* *Umax=3.7 V*				
2 TMB04-044-C2	4.7	0.64	98	0.75
2 TMB04-044-B2	4.0	0.81	97	0.97
2 TMB04-044-A2	3.2	1.24	96	1.46
2 TMB04-047-X3 *AxB = 6.4x8, CxD = 6.4x8* *Umax=4.5 V*				
2 TMB04-047-B3	5	0.86	104	083
2 TMB04-047-A3	3.7	1.32	103	1.32
2 TMB04-066-X2 *AxB = 8x8, CxD = 8x8,* *Umax=5.7 V*				
2 TMB04-066-C2	4.7	0.65	98	1.12
2 TMB04-066-B2	4.0	0.8	98	1.42
2 TMB04-066-A2	3.2	1.2	97	2.1
2 TMB04-080-X2 *AxB = 8x9.6, CxD = 8x9.6,* *Umax=6.9 V*				
2 TMB04-080-C2	4.7	0.64	98	1.4
2 TMB04-080-B2	4.0	0.8	98	1.72
2 TMB04-080-A2	3.2	1.2	97	2.55
2 TMB04-092-X2 *AxB = 9.6x9.6, CxD = 9.6x9.6,* *Umax=8.4 V*				
2 TMB04-092-C2	4.7	0.68	101	1.47
2 TMB04-092-B2	4.0	0.84	101	1.87
2 TMB04-092-A2	3.2	1.28	100	2.78
2 TMB04-092-X3 *AxB = 9.6x9.6, CxD = 9.6x9.6,* *Umax=8.4 V*				
2 TMB04-092-B3	5	0.82	101	1.77
2 TMB04-092-A3	3.7	1.34	100	2.9

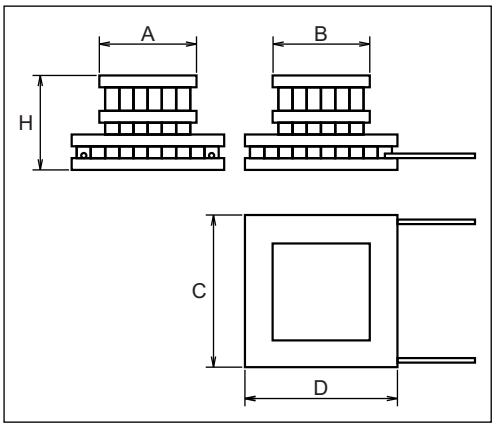
Definitions

Th Hot side temperature
Imax Current resulting in greatest Δ
Umax Voltage at ΔTmax
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I=Imax, ΔT=0)

Notes

- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)

TMB Series Multi-stage



TMB06 Sub-Series TECs: 3 to 5 Stages

3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TMB06-038-X12 *AxB = 4x4, CxD = 6x8*			*Umax=2.7 V*	***NEW !***
3 TMB06-038-C12	6.2	1.25	113	0.57
3 TMB06-038-B12	5.4	1.55	113	0.74
3 TMB06-038-A12	4.3	2.35	111	1.11
3 TMB06-044-X12 *AxB = 4x4, CxD = 8x8*			*Umax=3.3 V*	
3 TMB06-044-C12	6.2	1.2	116	0.6
3 TMB06-044-B12	5.4	1.6	116	0.76
3 TMB06-044-A12	4.3	2.4	115	1.13
3 TMB06-070-X12 *AxB =8x8, CxD =10x10*			*Umax=5.3 V*	***NEW !***
3 TMB06-070-C12	6.2	1.3	118	0.92
3 TMB06-070-B12	5.4	1.6	117	1.17
3 TMB06-070-A12	4.3	2.5	116	1.8
3 TMB06-074-X23 *AxB =8x8, CxD =10x10*			*Umax=5.5 V*	
3 TMB06-074-B23	7	1.5	114	1.38
3 TMB06-074-A23	5.3	2.4	113	2.16
3 TMB06-088-X13 *AxB = 8x8, CxD = 10x12*			*Umax=6.6 V*	
3 TMB06-088-B13	6.3	1.6	116	1.47
3 TMB06-088-A13	4.8	2.4	115	2.3
3 TMB06-100-X13 *AxB = 8x8, CxD = 12x12*			*Umax=7.8 V*	
3 TMB06-100-B13	6.3	1.6	118	1.5
3 TMB06-100-A13	4.8	2.5	117	2.4
3 TMB06-107-X12 *AxB = 8x8, CxD = 12x12*			*Umax=7.8 V*	***NEW !***
3 TMB06-107-C12	6.2	1.2	115	1.57
3 TMB06-107-B12	5.4	1.5	114	2
3 TMB06-107-A12	4.3	2.4	113	3.1

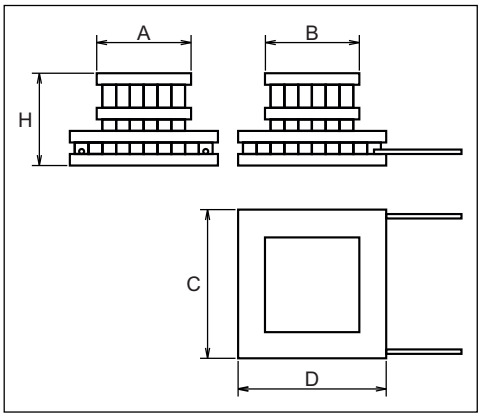
4-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
4 TMB06-115-X123 *AxB = 6x6, CxD = 12X12*			*Umax=7.5 V*	***NEW !***
4 TMB06-115-B123	7.5	1.4	129	0.79
4 TMB06-115-A123	5.8	2.3	127	1.27
4 TMB06-118-X123 *AxB = 6x6, CxD = 12x12*			*Umax=7.5 V*	***NEW !***
4 TMB06-118-B123	7.5	1.4	126	0.94
4 TMB06-118-A123	5.8	2.2	125	1.49
4 TMB06-121-X122 *AxB = 6x6, CxD = 12x12*			*Umax=7.5 V*	
4 TMB06-121-C122	8.8	1	124	0.87
4 TMB06-121-B122	7.5	1.3	123	1.11
4 TMB06-121-A122	5.8	2	122	1.64
4 TMB06-121-X123 *AxB = 6x6 (8x8), CxD = 12x12*			*Umax=7.5 V*	
4 TMB06-121-B123	8.4	1.3	124	1.07
4 TMB06-121-A123	6.3	2	123	1.66

5-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
5 TMB06-125-X1224 *AxB = 6x6, CxD = 12X12*			*Umax=7.2 V*	***NEW !***
5 TMB06-125-B1224	11.2	1.3	133	0.59
5 TMB06-125-A1224	8.3	1.9	132	0.87

TMB Series **Multi-stage**



Definitions

Th Hot side temperature
Imax Current resulting in greatest ΔT
Umax Voltage at ΔTmax
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I=Imax, ΔT=0)

Notes

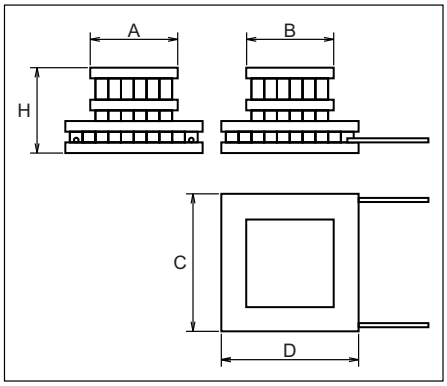
- All dimensions are given in mm
- Data shown are for Th=30^{O}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax(1-ΔT/ΔTmax)

TMB10 Sub-Series: 2-Stage TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB10-044-X2 *AxB = 15x15, CxD = 15x15*			*Umax=3.7V*	***NEW !***
2 TMB10-044-D2	7	3.3	98	.83
2 TMB10-044-C2	6.3	4	98	4.7
2 TMB10-044-B2	5.7	5.1	97	6.1
2 TMB10-044-A2	4.8	7.6	96	9.1
2 TMB10-047-X3 *AxB = 12x15, CxD = 12x15 Umax= 4.4V*				
2 TMB10-047-B3	6.5	5.2	104	5.2
2 TMB10-047-A3	5.3	8.2	103	8.2
2 TMB10-062-X2 *AxB = 12x12, CxD =15x15*			*Umax=5.5 V*	***NEW !***
2 TMB10-062-D2	7	3.4	102	4.9
2 TMB10-062-C2	6.3	4.3	102	6.1
2 TMB10-062-B2	5.7	5.3	101	7.9
2 TMB10-062-A2	4.8	8.1	100	11.8
2 TMB10-066-X2 *AxB = 15x15, CxD =15x15*			*Umax=5.7 V*	
2 TMB10-066-D2	7	3.3	98	5.7
2 TMB10-066-C2	6.3	4	98	6.9
2 TMB10-066-B2	5.7	4.9	98	8.8
2 TMB10-066-A2	4.8	7.6	97	13.2
2 TMB10-080-X2 *AxB = 15x18, CxD = 15x18*			*Umax= 6.9 V*	
2 TMB10-080-D2	7	3.3	98	6.9
2 TMB10-080-C2	6.3	4	98	8.4
2 TMB10-080-B2	5.7	5	98	19.7
2 TMB10-080-A2	4.8	7.5	97	15.9

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TMB10-092-X2 *AxB = 18x18, CxD = 18x18*			*Umax= 8.4 V*	
2 TMB10-092-D2	7	3.5	101	7.5
2 TMB10-092-C2	6.3	4.2	101	9.2
2 TMB10-092-B2	5.7	5.3	101	11.7
2 TMB10-092-A2	4.8	8.8	100	17.4
2 TMB10-092-X3 *AxB = 18x18, CxD = 18x18*			*Umax= 8.3 V*	
2 TMB10-092-B3	6.5	5.1	101	11
2 TMB10-092-A3	5.3	8	100	17.6
2 TMB10-122-X2 *AxB = 21x21, CxD = 21x21*			*Umax=11.4 V*	
2 TMB10-122-D2	7	3.5	103	9.2
2 TMB10-122-C2	6.3	4.3	103	11.4
2 TMB10-122-B2	5.7	5.5	103	14.6
2 TMB10-122-A2	4.8	8.2	102	21.6
2 TMB10-122-X3 *AxB = 21x21, CxD = 21x21*			*Umax=11.4 V*	
2 TMB10-122-B3	6.5	5.2	103	13.7
2 TMB10-122-A3	5.3	8.2	102	21.8
2 TMB10-134-X2 *AxB = 21x21, CxD = 21x21*			*Umax=11.5 V*	***NEW !***
2 TMB10-134-D2	7	3.1	98	11.4
2 TMB10-134-C2	6.3	3.9	98	14.2
2 TMB10-134-B2	5.7	5.2	98	19.3
2 TMB10-134-A2	4.8	7.7	96	27.7

TMB Series Multi-stage



Definitions

T_h	Hot side temperature
I_{max}	Current resulting in greatest ΔT
U_{max}	Voltage at ΔT_{max}
ΔT_{max}	Maximum temperature difference
Q_{max}	Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

Notes

- All dimensions are given in mm
- Data shown are for $T_h=30^oC$
- Q_{max} rated at $\Delta T=0$, at other ΔT cooling powers should be defined as $Q=Qmax\ (1-T/\Delta Tmax)$

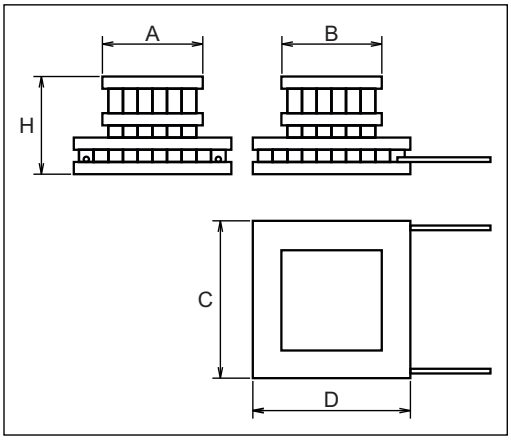
Heights can be varied to the specification on account of substrates thickness

TMB10 Sub-Series: 3-Stage TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TMB10-070-X12 *AxB =9x9, CxD =15x15*			*Umax=5.3 V*	***NEW !***
3 TMB10-070-D12	9.2	3	118	2.1
3 TMB10-070-C12	8.4	3.7	118	2.6
3 TMB10-070-B12	7.6	4.6	117	3.3
3 TMB10-070-A12	6.4	7	116	5
3 TMB10-074-X23 *AxB = 12x12, CxD =15x15*			*Umax=5.5 V*	
3 TMB10-074-B23	9.2	4.5	114	4.4
3 TMB10-074-A23	7.4	6.5	113	6
3 TMB10-088-X13 *AxB = 12x12, CxD = 15x18*			*Umax=6.6 V*	
3 TMB10-088-B13	8.4	4.3	116	4.1
3 TMB10-088-A13	6.9	6.5	115	6.4
3 TMB10-100-X13 *AxB = 12x12, CxD = 18x18*			*Umax=7.8 V*	
3 TMB10-100-B13	8.4	4.4	118	4.2
3 TMB10-100-A13	6.9	7	117	6.7
3 TMB10-107-X12 *AxB = 12x12 (15x15), CxD = 18x18*			*Umax=7.8 V*	***NEW !***
3 TMB10-107-D12	9.2	2.9	115	3.6
3 TMB10-107-C12	8.4	3.5	115	4.4
3 TMB10-107-B12	7.6	4.3	114	5.6
3 TMB10-107-A12	6.4	6.8	113	8.5

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TMB10-130-X23 *AxB = 12x12, CxD = 21x21*			*Umax=10.6 V*	***NEW !***
3 TMB10-130-B23	9.2	4.9	122	4.7
3 TMB10-130-A23	7.4	7.6	121	7.5
3 TMB10-136-X23 *AxB = 15x15, CxD = 21x21*			*Umax=10.6 V*	***NEW !***
3 TMB10-136-B23	9.2	4.7	120	5.6
3 TMB10-136-A23	7.4	7.3	119	8.9
3 TMB10-149-X12 *AxB = 12x12 (15x15), CxD = 21x21*			*Umax=10.9 V*	
3 TMB10-149-D12	9.2	2.9	115	4.9
3 TMB10-149-C12	8.4	3.5	115	6
3 TMB10-149-B12	7.6	4.4	114	7.7
3 TMB10-149-A12	6.4	6.6	113	11.7
3 TMB10-150-X12 *AxB = 15x15, CxD = 21x21*			*Umax=10.9 V*	
3 TMB10-150-D12	9.2	2.9	114	5.1
3 TMB10-150-C12	8.4	3.5	114	6.3
3 TMB10-150-B12	7.6	4.4	113	8.1
3 TMB10-150-A12	6.4	6.6	112	12.1

TMB Series Multi-stage



Definitions

T_h Hot side temperature
I_{max} Current resulting in greatest ΔT
U_{max} Voltage at ΔT_{max}
ΔT_{max} Maximum temperature difference
Q_{max} Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

Notes

- All dimensions are given in mm
- Data shown are for $T_h=30^oC$
- Q_{max} rated at $\Delta T=0$, at other ΔT cooling powers should be defined as $Q=Qmax\ (1-T/\Delta Tmax)$

Heights can be varied to the specification on account of substrates thickness

TMB10 Sub-Series: 4-Stage and 5-Stage TECs

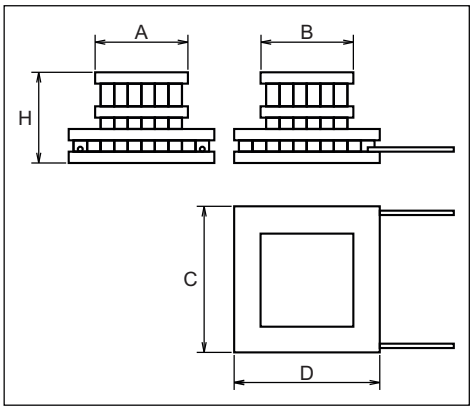
4-Stage

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
4 TMB10-115-X123 *AxB = 9x9, CxD = 18X18*			*Umax=7.6 V*	***NEW !***
4 TMB10-115-C123	12.5	3.2	129	1.8
4 TMB10-115-B123	11.1	4	129	2.2
4 TMB10-115-A123	9	6.3	127	3.5
4 TMB10-118-X123 *AxB = 9x9, CxD = 18X18*			*Umax=7.6 V*	***NEW !***
4 TMB10-118-C123	12.5	3.2	127	2.1
4 TMB10-118-B123	11.1	3.9	126	2.6
4 TMB10-118-A123	9	6	125	4.1
4 TMB10-121-X122 *AxB = 9x9, CxD =18X18*			*Umax=7.6 V*	
4 TMB10-121-D122	12.9	2.5	124	2
4 TMB10-121-C122	11.5	3	124	2.4
4 TMB10-121-B122	10.1	3.7	123	3.1
4 TMB10-121-A122	8.5	5.5	122	4.5
4 TMB10-121-X123 *AxB = 9x9 (12x12), CxD =18X18*			*Umax=7.6 V*	
4 TMB10-121-C123	12.5	3	124	2.4
4 TMB10-121-B123	11.1	3.7	124	3.1
4 TMB10-121-A123	9	5.5	123	4.5
4 TMB10-155-X122 *AxB = 9x9, CxD = 21X21*			*Umax=10.2 V*	***NEW !***
4 TMB10-155-D122	12.9	2.6	128	2.1
4 TMB10-155-C122	11.5	3.2	128	2.6
4 TMB10-155-B122	10.1	4.1	127	3.4
4 TMB10-147-A122	8.5	6.1	126	5
4 TMB10-155-X123 *AxB = 9x9 (12x12), CxD = CxD=21X21*			*Umax=10.2 V*	***NEW !***
4 TMB10-155-C123	12.5	3.2	128	2.6
4 TMB10-155-B123	11.1	4.1	127	3.4
4 TMB10-155-A123	9	6.1	126	5
4 TMB10-178-X112 *AxB = 12x12, CxD=21X21*			*Umax=10.4 V*	
4 TMB10-178-D112	11.6	2.4	121	3.2
4 TMB10-178-C112	10.5	2.9	120	4
4 TMB10-178-B112	9.4	3.5	119	5.1
4 TMB10-178-A112	8	5.5	118	7.7

5-Stage

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
5 TMB10-125-X1224 *AxB = 9x9, CxD = 18X18*			*Umax=7 V*	***NEW !***
5 TMB10-125-B1224	14.6	3.5	133	1.6
5 TMB10-125-A1224	11.6	5.3	132	2.4
5 TMB10-164-X1224 *AxB = 9x9, CxD = 21X21*			*Umax=10 V*	
5 TMB10-164-B1224	14.6	3.7	136	1.8
5 TMB10-164-A1224	11.6	5.4	135	2.6
5 TMB10-180-X1236 *A×B = 12×12 (15×15), C×D = 21×21*			*Umax=10.2 V*	***NEW !***
5 TMB10-180-A1236	14.6	5.4	133	3.3
5 TMB10-183-X1123 *AxB = 9x9 (12X12), CxD = 21X21*			*Umax=10 V*	***NEW !***
5 TMB10-183-C1123	14.6	2.7	131	2
5 TMB10-183-B1123	13	3.3	130	2.4
5 TMB10-183-A1123	10.6	5.3	129	3.8

TMB Series Multi-stage



Definitions

T_h	Hot side temperature
I_{max}	Current resulting in greatest ΔT
U_{max}	Voltage at ΔT_{max}
ΔT_{max}	Maximum temperature difference
Q_{max}	Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

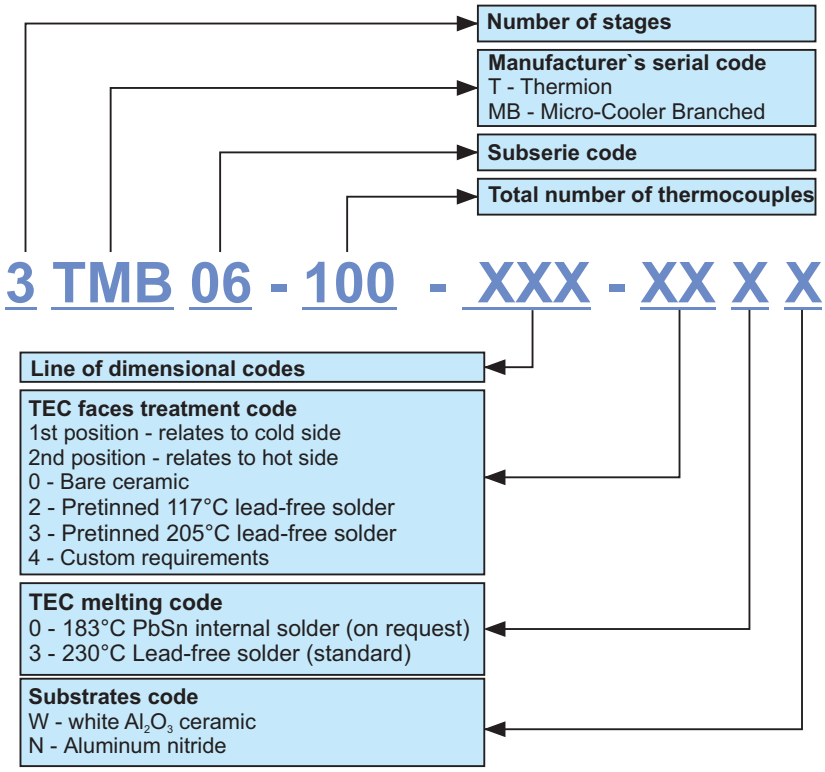
Notes

- All dimensions are given in mm
- Data shown are for $T_h=30^oC$
- Q_{max} rated at $\Delta T=0$, at other ΔT cooling power should be defined as $Q=Qmax\ (1-T/\Delta Tmax)$

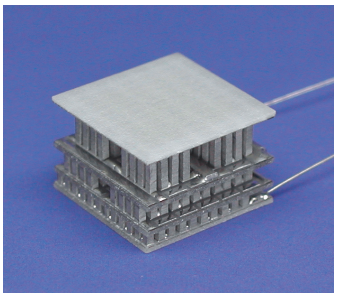
Heights can be varied to the specification on account of substrates thicknes

Designator Decoding

Within our catalogue area, our unique part numbering system enables customers to identify Thermion's products by construction, dimensions and performance



This part numbering system is unique to Thermion Services and forms part of our intellectual property



3TMB06-100-A12-020N

Standard height tolerances (mm)

±0.1 for 1 stage
±0.15 for 2 stage
±0.2 for 3 stage
±0.3 for 4 stage
±0.4 for 5 stage

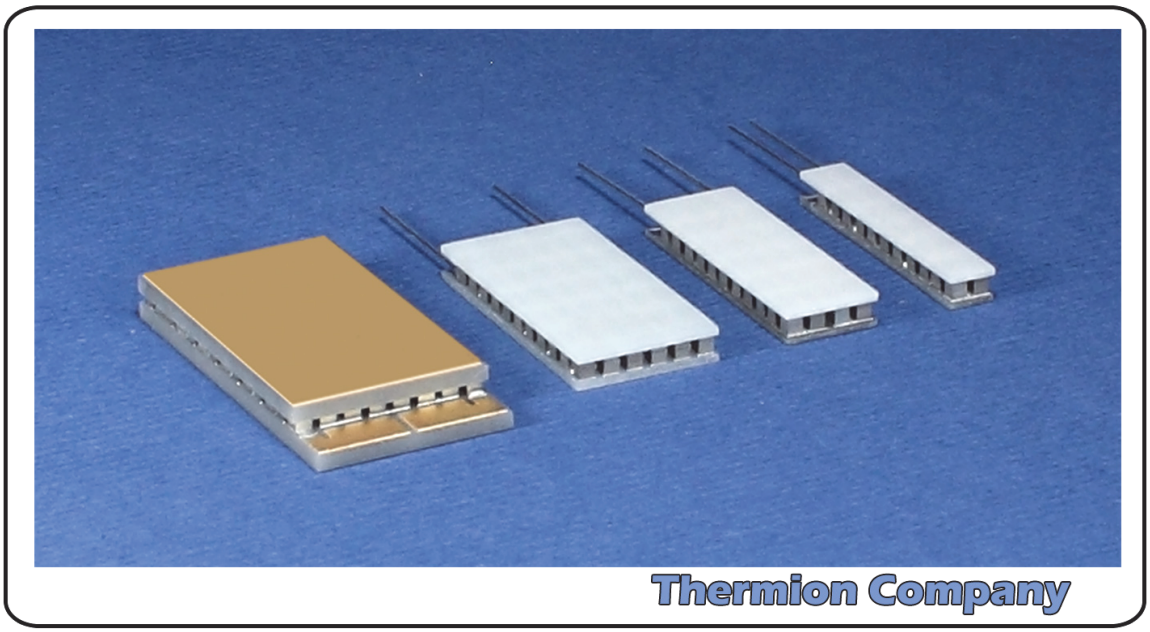
Special tolerances can be provided on request

If you are not sure what TE cooler should be selected or you need custom made device designed to specifications, please address directly to Thermion Company. Our specialists will be glad to assist you in choosing / working out TEC meeting your demands with minimal power consumptions.

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Features of TML-Series single Stage TECs

TML series of linear modules is destined for cooling lengthened heat sources such as semiconductor laser arrays, multi-element detectors, rectangular microchips and other oblong electronic and optoelectronic elements. About 200 different models are available.



TML04 Sub-Series

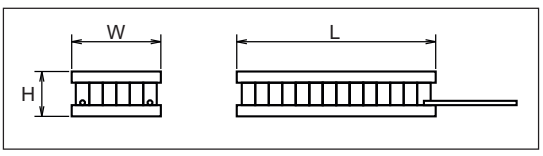
Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML04-9.6x3.2-XX *N=22 LxW = 9.6x3.2 Umax=2.6 V*				
1TML04-9.6x3.2-15	2.65	0.55	74	0.84
1TML04-9.6x3.2-12	2.35	0.7	74	1.01
1TML04-9.6x3.2-10	2.15	0.8	74	1.23
1TML04-9.6x3.2-08	1.95	1	74	1.5
1TML04-9.6x3.2-05	1.65	1.6	73	2.28
1TML04-9.6x4.8-XX *N=34 LxW = 9.6x4.8 Umax=4.1 V*				
1TML04-9.6x4.8-15	2.65	0.55	74	1.29
1TML04-9.6x4.8-12	2.35	0.7	74	1.56
1TML04-9.6x4.8-10	2.15	0.8	74	1.9
1TML04-9.6x4.8-08	1.95	1	74	2.31
1TML04-9.6x4.8-05	1.65	1.6	73	3.57
1TML04-9.6x6.4-XX *N=46 LxW = 9.6x6.4 Umax=5.5 V*				
1TML04-9.6x6.4-15	2.65	0.55	74	1.74
1TML04-9.6x6.4-12	2.35	0.7	74	2.15
1TML04-9.6x6.4-10	2.15	0.8	74	2.55
1TML04-9.6x6.4-08	1.95	1	74	3.13
1TML04-9.6x6.4-05	1.65	1.6	73	4.75

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML04-6.4x1.6-XX *N=7 LxW = 6.4x1.6 Umax=0.84 V*				
1TML04-6.4x1.6-15	2.65	0.55	74	0.27
1TML04-6.4x1.6-15	2.35	0.7	74	0.32
1TML04-6.4x1.6-15	2.15	0.8	74	0.39
1TML04-6.4x1.6-15	1.95	1	74	0.48
1TML04-6.4x1.6-15	1.65	1.6	73	0.73
1TML04-6.4x2.4-XX *N=11 LxW = 6.4x2.4 Umax=1.3 V*				
1TML04-6.4x2.4-15	2.65	0.55	74	0.42
1TML04-6.4x2.4-12	2.35	0.7	74	0.51
1TML04-6.4x2.4-10	2.15	0.8	74	0.62
1TML04-6.4x2.4-08	1.95	1	74	0.74
1TML04-6.4x2.4-05	1.65	1.6	73	1.14
1TML04-6.4x3.2-XX *N=15 LxW = 6.4x3.2 Umax=1.8 V*				
1TML04-6.4x3.2-15	2.65	0.55	74	0.57
1TML04-6.4x3.2-12	2.35	0.7	74	0.69
1TML04-6.4x3.2-10	2.15	0.8	74	0.84
1TML04-6.4x3.2-08	1.95	1	74	1.02
1TML04-6.4x3.2-05	1.65	1.6	73	1.56

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML04-8x3.2-XX *N=19 LxW = 8x3.2 Umax=2.3 V*				
1TML04-8x3.2-15	2.65	0.55	74	0.72
1TML04-8x3.2-12	2.35	0.7	74	0.87
1TML04-8x3.2-10	2.15	0.8	74	1.06
1TML04-8x3.2-08	1.95	1	74	1.29
1TML04-8x3.2-05	1.65	1.6	73	1.98
1TML04-8x4.8-XX *N=28 LxW = 8x4.8 Umax=3.4 V*				
1TML04-8x4.8-15	2.65	0.55	74	1.06
1TML04-8x4.8-12	2.35	0.7	74	1.29
1TML04-8x4.8-10	2.15	0.8	74	1.57
1TML04-8x4.8-08	1.95	1	74	1.9
1TML04-8x4.8-05	1.65	1.6	73	2.91
1TML04-8x6.4-XX *N=38 LxW = 8x6.4 Umax=4.5 V*				
1TML04-8x6.4-15	2.65	0.55	74	1.44
1TML04-8x6.4-12	2.35	0.7	74	1.75
1TML04-8x6.4-10	2.15	0.8	74	2.13
1TML04-8x6.4-08	1.95	1	74	2.58
1TML04-8x6.4-05	1.65	1.6	73	3.95

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML04-4.8x1.6-XX *N=5 LxW = 4.8x1.6 Umax=0.6 V*				
1TML04-4.8x1.6-15	2.65	0.55	74	0.19
1TML04-4.8x1.6-12	2.35	0.7	74	0.23
1TML04-4.8x1.6-10	2.15	0.8	74	0.28
1TML04-4.8x1.6-08	1.95	1	74	0.34
1TML04-4.8x1.6-05	1.65	1.6	73	0.52
1TML04-4.8x2.4-XX *N=8 LxW = 4.8x2.4 Umax=0.96 V*				
1TML04-4.8x2.4-15	2.65	0.55	74	0.3
1TML04-4.8x2.4-12	2.35	0.7	74	0.37
1TML04-4.8x2.4-10	2.15	0.8	74	0.45
1TML04-4.8x2.4-08	1.95	1	74	0.54
1TML04-4.8x2.4-05	1.65	1.6	73	0.83

TML04 Linear Series Single Stage



Note: Options with wire direction perpendicular to that shown at the figure are available.

TML06 Sub-Series

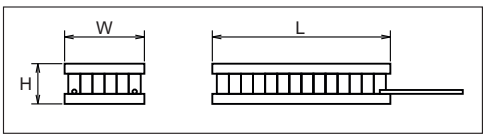
Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML06-12x2-XX *N=11 LxW = 12x2 Umax=1.3 V*				
1TML06-12x2-15	2.65	1.3	74	0.95
1TML06-12x2-12	2.35	1.6	74	1.17
1TML06-12x2-10	2.15	1.9	74	1.36
1TML06-12x2-08	1.95	2.3	74	1.69
1TML06-12x2-05	1.65	3.4	73	2.55
1TML06-12x4-XX *N=22 LxW = 12x4 Umax=2.6 V*				
1TML06-12x4-15	2.65	1.3	74	1.89
1TML06-12x4-12	2.35	1.6	74	2.33
1TML06-12x4-10	2.15	1.9	74	2.73
1TML06-12x4-08	1.95	2.3	74	3.39
1TML06-12x4-05	1.65	3.4	73	5.1
1TML06-12x6-XX *N=34 LxW = 12x6 Umax=4.1 V*				
1TML06-12x6-15	2.65	1.3	74	2.92
1TML06-12x6-12	2.35	1.6	74	3.6
1TML06-12x6-10	2.15	1.9	74	4.22
1TML06-12x6-08	1.95	2.3	74	5.24
1TML06-12x6-05	1.65	3.4	73	7.89
1TML06-12x8-XX *N=46 LxW = 12x8 Umax=5.5 V*				
1TML06-12x8-15	2.65	1.3	74	3.92
1TML06-12x8-12	2.35	1.6	74	4.84
1TML06-12x8-10	2.15	1.9	74	5.74
1TML06-12x8-08	1.95	2.3	74	7.05
1TML06-12x8-05	1.65	3.5	73	10.7

Model	H (mm)	I_{max} (A)	ΔT_{max} K)	Q_{max} (W)
1TML06-10x2-XX *N=9 LxW = 10x2 Umax=1.1 V*				
1TML06-10x2-15	2.65	1.3	74	0.77
1TML06-10x2-12	2.35	1.6	74	0.95
1TML06-10x2-10	2.15	1.9	74	1.12
1TML06-10x2-08	1.95	2.3	74	1.39
1TML06-10x2-05	1.65	3.4	73	2.09
1TML06-10x4-XX *N=19 LxW = 10x4 Umax=2.3 V*				
1TML06-10x4-15	2.65	1.3	74	1.63
1TML06-10x4-12	2.35	1.6	74	2.01
1TML06-10x4-10	2.15	1.9	74	2.35
1TML06-10x4-08	1.95	2.3	74	2.93
1TML06-10x4-05	1.65	3.4	73	4.41
1TML06-10x6-XX *N=28 LxW = 10x6 Umax=3.4 V*				
1TML06-10x6-15	2.65	1.3	74	2.41
1TML06-10x6-12	2.35	1.6	74	2.97
1TML06-10x6-10	2.15	1.9	74	3.47
1TML06-10x6-08	1.95	2.3	74	4.31
1TML06-10x6-05	1.65	3.4	73	6.5
1TML06-10x8-XX *N=38 LxW = 10x8 Umax=4.5 V*				
1TML06-10x8-15	2.65	1.3	74	3.27
1TML06-10x8-12	2.35	1.6	74	4.03
1TML06-10x8-10	2.15	1.9	74	4.71
1TML06-10x8-08	1.95	2.3	74	5.85
1TML06-10x8-05	1.65	3.4	73	8.82

Model	H (mm)	I_{max} (A)	ΔT_{max} K)	Qmax (W)
1TML06-8x2-XX *N=7 LxW = 8x2 Umax=0.84 V*				
1TML06-8x2-15	2.65	1.3	74	0.6
1TML06-8x2-12	2.35	1.6	74	0.74
1TML06-8x2-10	2.15	1.9	74	0.87
1TML06-8x2-08	1.95	2.3	74	1.08
1TML06-8x2-05	1.65	3.4	73	1.62
1TML06-8x4-XX *N=15 LxW = 8x4 Umax=1.8 V*				
1TML06-8x4-15	2.65	1.3	74	1.29
1TML06-8x4-12	2.35	1.6	74	1.59
1TML06-8x4-10	2.15	1.9	74	1.86
1TML06-8x4-08	1.95	2.3	74	2.31
1TML06-8x4-05	1.65	3.4	73	3.48

Model	H (mm)	I_{max} (A)	ΔT_{max} K)	Qmax (W)
1TML06-6x2-XX *N=5 LxW = 6x2 Umax=0.6 V*				
1TML06-6x2-15	2.65	1.3	74	0.43
1TML06-6x2-12	2.35	1.6	74	0.53
1TML06-6x2-10	2.15	1.9	74	0.62
1TML06-6x2-08	1.95	2.3	74	0.77
1TML06-6x2-05	1.65	3.4	73	1.16

TML06 Linear Series Single Stage



Note: Options with wire direction perpendicular to that shown at the figure are available.

TML10 Sub-Series TECs

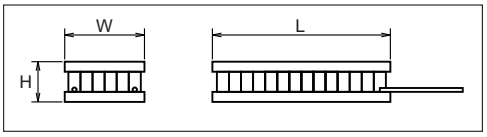
Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML10-21x6-XX *N=26 LxW=21x6 Umax=3.1 V*				
1TML10-21x6-20	4.1	2.7	74	4.7
1TML10-21x6-15	3.6	3.5	74	6.1
1TML10-21x6-12	3.3	4.3	74	7.6
1TML10-21x6-10	3.1	5.2	74	9
1TML10-21x6-08	2.9	6.3	74	11.1
1TML10-21x6-05	3.0	9.7	73	16.7
1TML10-21x9-XX *N=40 LxW=21x9 Umax=4.8 V*				
1TML10-21x9-20	4.1	2.7	74	7.3
1TML10-21x9-15	3.6	3.5	74	9.4
1TML10-21x9-12	3.3	4.3	74	11.7
1TML10-21x9-10	3.1	5.2	74	13.8
1TML10-21x9-08	2.9	6.3	74	17
1TML10-21x9-05	3.0	9.7	73	25.8
1TML10-21x12-XX *N=54 LxW=21x12 Umax=6.5 V*				
1TML10-21x12-20	4.1	2.7	74	9.8
1TML10-21x12-15	3.6	3.5	74	12.7
1TML10-21x12-12	3.3	4.3	74	15.8
1TML10-21x12-10	3.1	5.2	74	18.7
1TML10-21x12-08	2.9	6.3	74	23
1TML10-21x12-05	3.0	9.7	73	34.8
1TML10-21x15-XX *N=68 LxW=21x15 Umax=8.1 V*				
1TML10-21x15-20	4.1	2.7	74	12.4
1TML10-21x15-15	3.6	3.5	74	16.1
1TML10-21x15-12	3.3	4.3	74	19.6
1TML10-21x15-10	3.1	5.2	74	23.5
1TML10-21x15-08	2.9	6.3	74	29
1TML10-21x15-05	3.0	9.7	73	43.8
1TML10-21x18-XX *N=82 LxW=21x18 Umax=9.8 V*				
1TML10-21x18-20	4.1	2.7	74	14.9
1TML10-21x18-15	3.6	3.5	74	19.4
1TML10-21x18-12	3.3	4.3	74	23.9
1TML10-21x18-10	3.1	5.2	74	28.4
1TML10-21x18-08	2.9	6.3	74	34.9
1TML10-21x18-05	3.0	9.7	73	52.8

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML10-18x3-XX *N=11 LxW=18x3 Umax=1.3 V*				
1TML10-18x3-20	4.1	2.7	74	2
1TML10-18x3-15	3.6	3.5	74	2.6
1TML10-18x3-12	3.3	4.3	74	3.2
1TML10-18x3-10	3.1	5.2	74	3.8
1TML10-18x3-08	2.9	6.3	74	4.7
1TML10-18x3-05	3.0	9.7	73	7.1
1TML10-18x6-XX *N=22 LxW=18x6 Umax=2.6 V*				
1TML10-18x6-20	4.1	2.7	74	4
1TML10-18x6-15	3.6	3.5	74	5.2
1TML10-18x6-12	3.3	4.3	74	6.4
1TML10-18x6-10	3.1	5.2	74	7.6
1TML10-18x6-08	2.9	6.3	74	9.4
1TML10-18x6-05	3.0	9.7	73	14.2
1TML10-18x9-XX *N=34 LxW=18x9 Umax=4.1 V*				
1TML10-18x9-20	4.1	2.7	74	6.2
1TML10-18x9-15	3.6	3.5	74	8
1TML10-18x9-12	3.3	4.3	74	9.9
1TML10-18x9-10	3.1	5.2	74	11.8
1TML10-18x9-08	2.9	6.3	74	14.5
1TML10-18x9-05	3.0	9.7	73	21.9
1TML10-18x12-XX *N=46 LxW=18x12 Umax=5.5 V*				
1TML10-18x12-20	4.1	2.7	74	8.4
1TML10-18x12-15	3.6	3.5	74	10.9
1TML10-18x12-12	3.3	4.3	74	13.4
1TML10-18x12-10	3.1	5.2	74	15.9
1TML10-18x12-08	2.9	6.3	74	19.6
1TML10-18x12-05	3.0	9.7	73	29.6
1TML10-18x15-XX *N=58 LxW=18x15 Umax=7 V*				
1TML10-18x15-20	4.1	2.7	74	10.6
1TML10-18x15-15	3.6	3.5	74	13.7
1TML10-18x15-12	3.3	4.3	74	16.9
1TML10-18x15-10	3.1	5.2	74	20.1
1TML10-18x15-08	2.9	6.3	74	24.7
1TML10-18x15-05	3.0	9.7	73	37.4

Definitions

N Number of thermocouples
T_h Hot side temperature
I_{max} Current resulting in greatest ΔT
U_{max} Voltage at ΔT_{max}
ΔT_{max} Maximum temperature difference
Q_{max} Maximum cooling power ($I=I_{max}$, $\Delta T=0$)

TML10 Linear Series Single Stage



Note: Option with wire direction perpendicular to that shown at the figure is available.

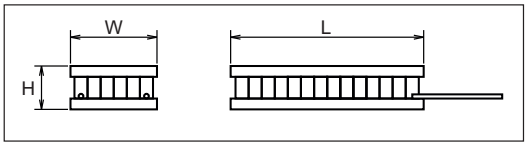
Continuation

TML10 Sub-Series TECs

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML10-15x3-XX *N=9 LxW=15x3 Umax=1.1 V*				
1TML10-15x3-20	4.1	2.7	74	1.6
1TML10-15x3-15	3.6	3.5	74	2.1
1TML10-15x3-12	3.3	4.3	74	2.6
1TML10-15x3-10	3.1	5.2	74	3.1
1TML10-15x3-08	2.9	6.3	74	3.8
1TML10-15x3-05	3.0	9.7	73	5.8
1TML10-15x6-XX *N=19 LxW=15x6 Umax=2.3 V*				
1TML10-15x6-20	4.1	2.7	74	3.5
1TML10-15x6-15	3.6	3.5	74	4.5
1TML10-15x6-12	3.3	4.3	74	5.6
1TML10-15x6-10	3.1	5.2	74	6.6
1TML10-15x6-08	2.9	6.3	74	8.1
1TML10-15x6-05	3.0	9.7	74	12.2

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
1TML10-15x9-XX *N=28 LxW=15x9 Umax=3.7 V*				
1TML10-15x9-20	4.1	2.7	74	5.1
1TML10-15x9-15	3.6	3.5	74	6.6
1TML10-15x9-12	3.3	4.3	74	8.2
1TML10-15x9-10	3.1	5.2	74	9.7
1TML10-15x9-08	2.9	6.3	74	11.9
1TML10-15x9-05	3.0	9.7	73	18
1TML10-15x12-XX *N=38 LxW=15x12 Umax=4.6 V*				
1TML10-15x12-20	4.1	2.7	74	6.9
1TML10-15x12-15	3.6	3.5	74	9
1TML10-15x12-12	3.3	4.3	74	11.1
1TML10-15x12-10	3.1	5.2	74	13.2
1TML10-15x12-08	2.9	6.3	74	16.2
1TML10-15x12-05	3.0	9.7	73	24.5

TML10 Linear Series Single Stage



Options with wire direction perpendicular to that shown at the figure are available

Definitions

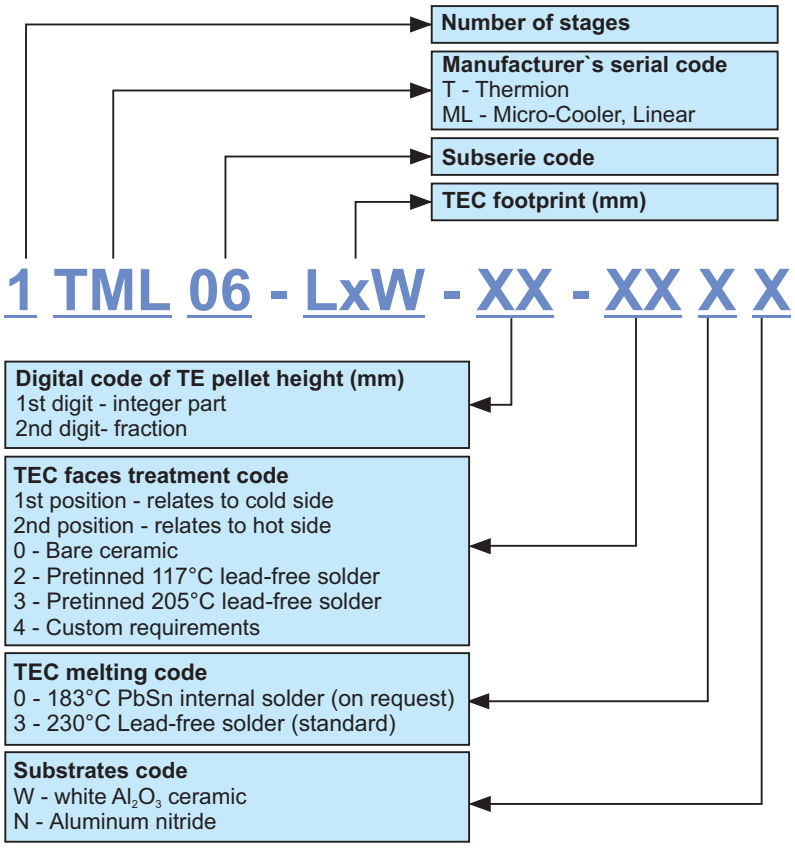
N Number of thermocouples
Th Hot side temperature
Imax Current resulting in greatest ΔT
Umax Voltage at ΔTmax
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I=Imax, ΔT=0)

Notes

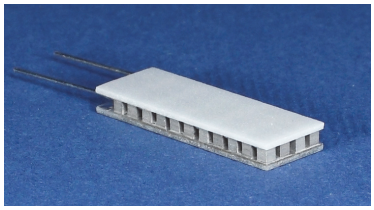
- All dimensions are given in mm
- Data shown are for Th=30°C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as $Q=Q_{max}(1-\Delta T/\Delta T_{max})$

Designator Decoding

Within our catalogue area, our unique part numbering system enables customers to identify Thermion's products by construction, dimensions and performance



This part numbering system is unique to Thermion Services and forms part of our intellectual property

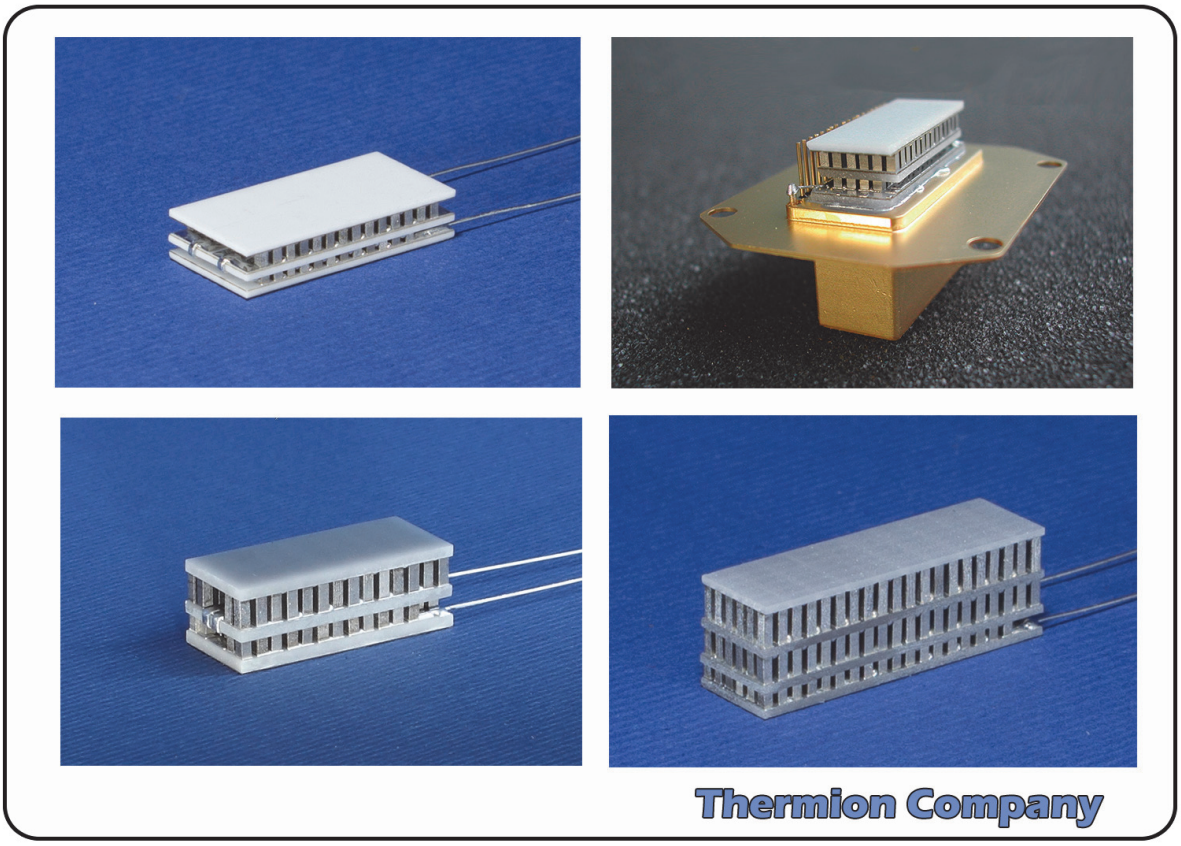


1TML10-18x6-10-023W

If you are not sure what TE cooler should be selected or you need custom made device designed to specifications, please address directly to Thermion Company. Our specialists will be glad to assist you in choosing / working out TEC meeting your demands with minimal power consumptions.

Features of TLB-Series TECs

Thermion introduces a NEW line of high efficient liner cascade modules having advantage of identical top and bottom substrate dimensions and enlarged ΔT value. Over 160 new cascade configurations are available based on TLB04, TLB06 and TLB10 sub-series.



TLB04 Sub-Series: 2-Stage and 3-Stage TECs

2-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TLB04-9.6x3.2-X2 *LxW = 9.6x3.2*			*Umax= 2.7 V*	***NEW !***
2TLB04-9.6x3.2-C2	4.7	0.62	97	0.57
2TLB04-9.6x3.2-B2	4	0.8	97	0.73
2TLB04-9.6x3.2-A2	3.2	1.22	96	1.11
2TLB04-9.6x4.8-X2 *LxW = 9.6x4.8*			*Umax= 4 V*	
2TLB04-9.6x4.8-C2	4.7	0.66	100	0.74
2TLB04-9.6x4.8-B2	4	0.82	100	0.94
2TLB04-9.6x4.8-A2	3.2	1.26	99	1.4
2TLB04-9.6x6.4-X2 *LxW = 9.6x6.4*			*Umax= 5.5 V*	***NEW !***
2TLB04-9.6x6.4-C2	4.7	0.64	98	1.1
2TLB04-9.6x6.4-B2	4	0.82	97	1.42
2TLB04-9.6x6.4-A2	3.2	1.22	96	2.21
2TLB04-9.6x6.4-X3 *LxW = 9.6x6.4*			*Umax= 5.3 V*	***NEW !***
2TLB04-9.6x6.4-B3	5	0.87	104	1
2TLB04-9.6x6.4-A3	3.7	1.38	103	1.63

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TLB04-8x3.2-X2 *LxW = 8x3.2*			*Umax= 2.3 V*	***NEW !***
2TLB04-8x3.2-C2	4.7	0.64	98	0.46
2TLB04-8x3.2-B2	4	0.8	97	0.62
2TLB04-8x3.2-A2	3.2	1.22	96	0.93
2TLB04-8x4.8-X2 *LxW = 8x4.8*			*Umax=3.3 V*	
2TLB04-8x4.8-C2	4.7	0.66	99	0.63
2TLB04-8x4.8-B2	4	0.82	99	0.78
2TLB04-8x4.8-A2	3.2	1.24	98	1.15

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2TLB04-6.4x3.2-X2 *LxW = 6.4x3.2*			*Umax=1.8 V*	***NEW !***
2TLB04-6.4x3.2-C2	4.7	0.64	99	0.35
2TLB04-6.4x3.2-B2	4	0.82	98	0.46
2TLB04-6.4x3.2-A2	3.2	1.24	97	0.71

Notes

- All dimensions are given in mm
- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)

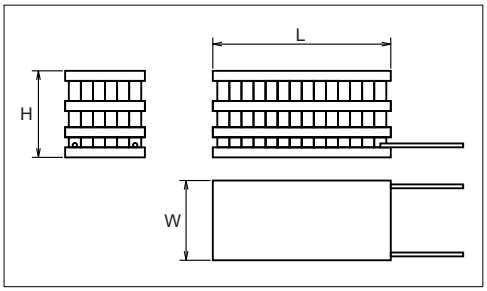
3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TLB04-9.6x4.8-X24 *LxW = 9.6x4.8*			*Umax= 3.8 V*	***NEW !***
3TLB04-9.6x4.8-A24	5.7	1.1	115	0.65
3TLB04-9.6x6.4-X22 *LxW = 9.6x6.4*			*Umax= 5.3 V*	
3TLB04-9.6x6.4-C22	7.2	0.52	110	0.58
3TLB04-9.6x6.4-B22	6	0.66	110	0.74
3TLB04-9.6x6.4-A22	4.7	1	109	1.14
3TLB04-9.6x6.4-X23 *LxW = 9.6x6.4*			*Umax= 5.3 V*	
3TLB04-9.6x6.4-B23	7	0.66	110	0.74
3TLB04-9.6x6.4-A23	5.2	1	109	1.14
3TLB04-9.6x6.4-X24 *LxW = 9.6x6.4*			*Umax= 5.3 V*	
3TLB04-9.6x6.4-A24	5.7	1.12	117	0.81

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3TLB04-8x4.8-X24 *LxW = 8x4.8*			*Umax= 3.2 V*	***NEW !***
3TLB04-8x4.8-A24	5.7	1.1	114	0.57

TLB Series Multi-stage

Top = Base



Definitions

Th	Temperature of TEC hot side
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max, ΔT=0)

TLB06 Sub-Series: 2-Stage and 3-Stage TECs

2-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB06-12x4-X2 *LxW = 12x4*			*Umax= 2.7 V*	***NEW !***
2 TLB06-12x4-C2	4.7	1.4	97	1.27
2 TLB06-12x4-B2	4	1.8	97	1.65
2 TLB06-12x4-A2	3.2	2.7	96	2.49
2 TLB06-12x6-X2 *LxW = 12x6*			*Umax= 4 V*	
2 TLB06-12x6-C2	4.7	1.48	100	1.66
2 TLB06-12x6-B2	4	1.87	100	2.2
2 TLB06-12x6-A2	3.2	2.8	99	3.94
2 TLB06-12x8-X2 *LxW = 12x8*			*Umax= 5.5 V*	***NEW !***
2 TLB06-12x8-C2	4.7	1.45	98	2.5
2 TLB06-12x8-B2	4	1.85	97	3.2
2 TLB06-12x8-A2	3.2	2.75	96	5
2 TLB06-12x8-X3 *LxW = 12x8*			*Umax= 5.3 V*	***NEW !***
2 TLB06-12x8-B3	5	1.95	104	2.26
2 TLB06-12x8-A3	3.7	3.1	103	3.66

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB06-10x4-X2 *L×W = 10x4*			*Umax= 2.3 V*	***NEW !***
2 TLB06-10x4-C2	4.7	1.45	98	1.04
2 TLB06-10x4-B2	4	1.8	97	1.39
2 TLB06-10x4-A2	3.2	2.75	96	2.1
2 TLB06-10x6-X2 *LxW = 10x6*			*Umax=3.3 V*	
2 TLB06-10x6-C2	4.7	1.5	99	1.37
2 TLB06-10x6-B2	4	1.85	99	1.76
2 TLB06-10x6-A2	3.2	2.8	98	2.6

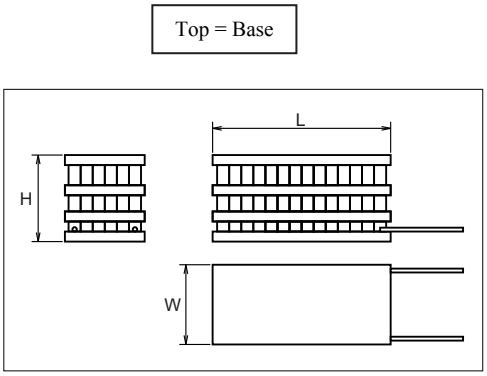
Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB06-8x4-X2 *LxW = 8x4*			*Umax=1.8 V*	***NEW !***
2 TLB06-8x4-C2	4.7	1.45	99	0.83
2 TLB06-8x4-B2	4	1.85	98	1.04
2 TLB06-8x4-A2	3.2	2.8	97	1.55

3-Stage

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TLB06-12x6-X24 *LxW = 12x6*			*Umax=3.8 V*	***NEW !***
3 TLB06-12x6-B24	7.5	1.7	116	0.98
3 TLB06-12x6-A24	5.7	2.5	115	1.45
3 TLB06-12x8-X22 *LxW = 12x8*			*Umax=5.3 V*	
3 TLB06-12x8-C22	7.2	1.15	110	1.29
3 TLB06-12x8-B22	6	1.5	110	1.67
3 TLB06-12x8-A22	4.7	2.2	109	2.46
3 TLB06-12x8-X23 *LxW = 12x8*			*Umax=5.3 V*	
3 TLB06-12x8-B23	7	1.46	110	1.6
3 TLB06-12x8-A23	5.2	2.25	109	2.49
3 TLB06-12x8-X24 *LxW = 12x8*			*Umax= 5.3 V*	
3 TLB06-12x8-B24	7.5	1.7	117	1.22
3 TLB06-12x8-A24	5.7	2.5	116	1.82

Model	H (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TLB06-10x6-X24 *LxW = 10x6*			*Umax=3.2 V*	***NEW !***
3 TLB06-10x6-B24	7.5	1.65	115	0.85
3 TLB06-10x6-A24	5.7	2.55	114	1.27

TLB Series Multi-stage



Notes

- All dimensions are given in mm
- Data shown are for Th=30^{o}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)
- Modules height can be varied on account of substrates thickness

Definitions

Th	Temperature of TEC hot side
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = I max , ΔT=0)

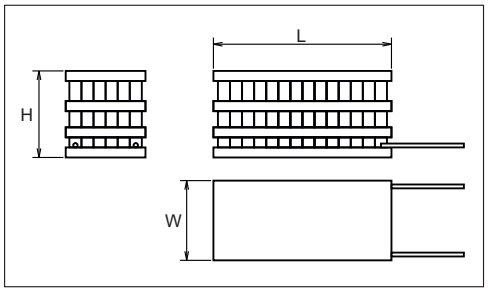
TLB10 Sub-Series: 2-Stage TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB10-21x9-X2 *LxW = 21x9*			*Umax=4.7 V*	
2 TLB10-21x9-D2	7	3.7	100	4.4
2 TLB10-21x9-C2	6.3	4.1	100	5.4
2 TLB10-21x9-B2	5.6	5.2	100	6.9
2 TLB10-21x9-A2	4.8	7.8	99	10.2
2 TLB10-21x12-X2 *LxW = 21x12*			*Umax=6.4 V*	
2 TLB10-21x12-D2	7	3	94	7.1
2 TLB10-21x12-C2	6.3	3.7	94	8.7
2 TLB10-21x12-B2	5.6	4.7	94	11.1
2 TLB10-21x12-A2	4.8	7	93	16.5
2 TLB10-21x12-X3 *LxW = 21x12*			***NEW !*** *Umax=6.3 V*	
2 TLB10-21x12-B3	6.6	5.4	104	7.3
2 TLB10-21x12-A3	5.3	8.6	103	11.9
2 TLB10-21x15-X2 *LxW = 21x15*			*Umax=8.1 V*	
2 TLB10-21x15-D2	7	3.3	98	8.1
2 TLB10-21x15-C2	6.3	4	98	9.9
2 TLB10-21x15-B2	5.6	5	98	12.6
2 TLB10-21x15-A2	4.8	7.5	97	18.7

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB10-18x6-X2 *LxW = 18x6*			***NEW !*** *Umax= 2.7 V*	
2 TLB10-18x6-D2	7	3.2	97	2.7
2 TLB10-18x6-C2	6.3	3.9	97	3.5
2 TLB10-18x6-B2	5.6	5	97	4.6
2 TLB10-18x6-A2	4.8	7.6	96	6.9
2 TLB10-18x9-X2 *LxW = 18x9*			*Umax= 4 V*	
2 TLB10-18x9-D2	7	3.4	100	3.8
2 TLB10-18x9-C2	6.3	4.1	100	4.6
2 TLB10-18x9-B2	5.6	5.2	100	5.9
2 TLB10-18x9-A2	4.8	7.8	99	8.7
2 TLB10-18x12-X2 *LxW = 18x12*			***NEW !*** *Umax=5.5 V*	
2 TLB10-18x12-D2	7	3.3	98	5.6
2 TLB10-18x12-C2	6.3	4	98	6.9
2 TLB10-18x12-B2	5.6	5.1	97	8.9
2 TLB10-18x12-A2	4.8	7.6	96	13.8
2 TLB10-18x12-X3 *LxW = 18x12*			***NEW !*** *Umax=5.3 V*	
2 TLB10-18x12-B3	6.6	5.4	104	6.27
2 TLB10-18x12-A3	5.3	8.6	103	10.2

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
2 TLB10-15x6-X2 *LxW = 15x6*			***NEW !*** *Umax= 2.3 V*	
2 TLB10-15x6-D2	7	3.3	98	2.3
2 TLB10-15x6-C2	6.3	4	98	2.9
2 TLB10-15x6-B2	5.6	5	97	3.9
2 TLB10-15x6-A2	4.8	7.6	96	5.8
2 TLB10-15x9-X2 *LxW = 15x9*			*Umax= 3.2 V*	
2 TLB10-15x9-D2	7	3.4	99	3.1
2 TLB10-15x9-C2	6.3	4.1	99	3.8
2 TLB10-15x9-B2	5.6	5.1	99	4.9
2 TLB10-15x9-A2	4.8	7.6	98	7.2

TLB Series Multi-stage



Definitions

Th	Temperature of TEC hot side
Imax	Current resulting in greatest ΔT
Umax	Voltage at ΔTmax
ΔTmax	Maximum temperature difference
Qmax	Maximum cooling power (I = Imax , ΔT=0)

Notes

- All dimensions are given in mm
- Data shown are for Th=30^{O}C
- Qmax rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-ΔT/ΔTmax)

**Modules height can be varied on account of substrates thickness*

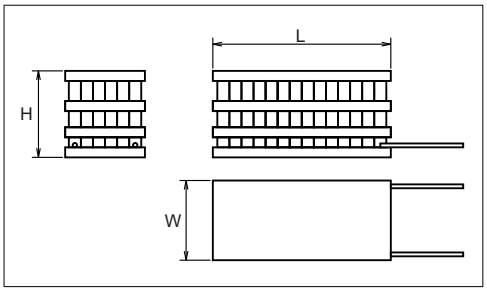
TLB10 Sub-Series: 3-Stage TECs

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TLB10-21x12-X23 *LxW = 21x12*			*Umax= 6.3 V*	
3 TLB10-21x12-B23	9,2	4	110	5.3
3 TLB10-21x12-A23	7.7	6.2	109	8.2
3 TLB10-21x15-X23 *LxW = 21x15*			*Umax= 7.7 V*	
3 TLB10-21x15-B23	9.2	4.3	113	5.6
3 TLB10-21x15-A23	7.7	6.5	112	8.8

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TLB10-18x9-X24 *LxW = 18x9*			***NEW !*** *Umax=3.8 V*	
3 TLB10-18x9-B24	9.7	4.7	116	2.2
3 TLB10-18x9-A24	7.9	6.9	115	4
3 TLB10-18x12-X22 *LxW = 18x12*			*Umax= 5.4 V*	
3 TLB10-18x12-C22	9.4	3.3	110	3.6
3 TLB10-18x12-B22	8.2	4.1	110	4.6
3 TLB10-18x12-A22	6.9	6.2	109	6.9
3 TLB10-18x12-X23 *LxW = 18x12*			*Umax= 5.3 V*	
3 TLB10-18x12-B23	9.2	4.1	110	4.6
3 TLB10-18x12-A23	7.4	6.2	109	6.9
3 TLB10-18x12-X24 *LxW = 18x12*			***NEW !*** *Umax= 5.6 V*	
3 TLB10-18x12-B24	9.7	4.7	117	3.4
3 TLB10-18x12-A24	7.9	7	116	5

Model	H* (mm)	I_{max} (A)	ΔT_{max} (K)	Q_{max} (W)
3 TLB10-15x9-X24 *LxW = 15x9*			***NEW !*** *Umax= 3.3 V*	
3 TLB10-15x9-B24	9.7	4.6	115	2.36
3 TLB10-15x9-A24	7.9	67.1	114	3.53

TLB Series Multi-stage



Definitions

T_h Temperature of TEC hot side
Imax Current resulting in greatest ΔT
Umax Voltage at ΔT_{max}
ΔTmax Maximum temperature difference
Qmax Maximum cooling power (I = I max , ΔT=0)

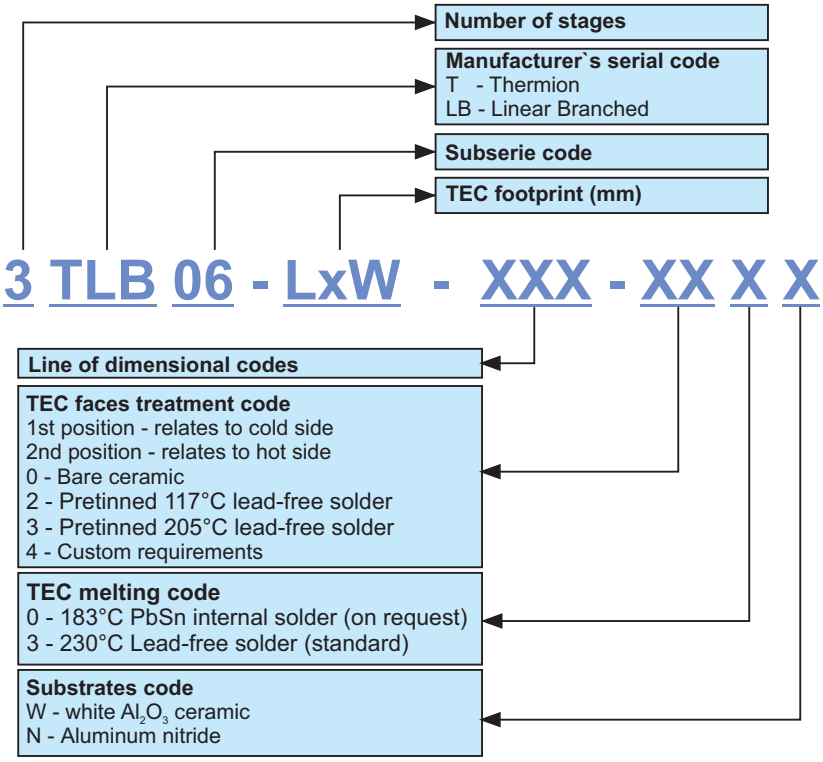
Notes

- All dimensions are given in mm
- Data shown are for T_h=30^{O}C
- Q_{max} rated at ΔT=0, at other ΔT cooling power should be defined as Q=Qmax (1-$\Delta T/\Delta T$max)

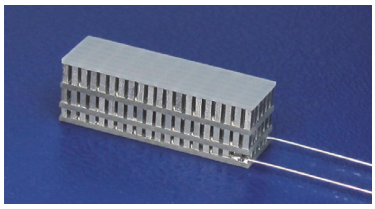
Heights can be varied to specification on account of substrates thickness

Designator Decoding

Within our catalogue area, our unique part numbering system enables customers to identify Thermion's products by construction, dimensions and performance



This part numbering system is unique to Thermion Services and forms part of our intellectual property



3TLB06-20x6-A23-003N

Standard height tolerances (mm)

±0.1 for 1 stage
±0.15 for 2 stage
±0.2 for 3 stage

Special tolerances can be provided on request

If you are not sure what TE cooler should be selected or you need custom made device designed to specifications, please address directly to Thermion Company. Our specialists will be glad to assist you in choosing / working out TEC meeting your demands with minimal power consumptions.

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Discounts: Are available for volume purchases

Terms: CPT: named place of destination via DHL unless otherwise is specially provided in writing. All shipping charges will be prepaid and added to the invoice unless otherwise is specified

Payment: For all invoices net 30 days, by transfer into Thermion Company nominated account

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