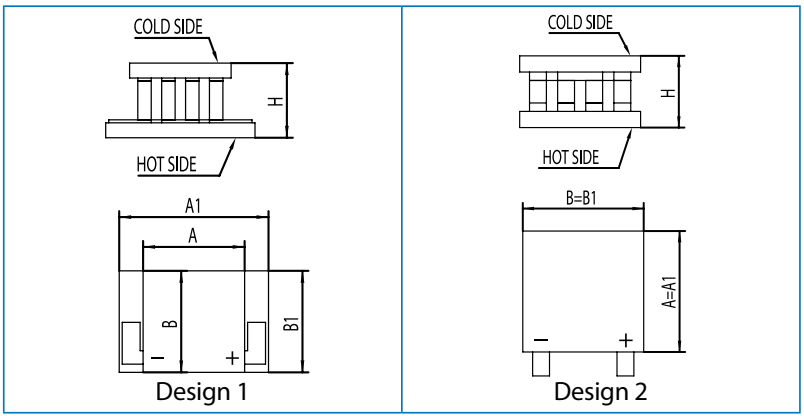
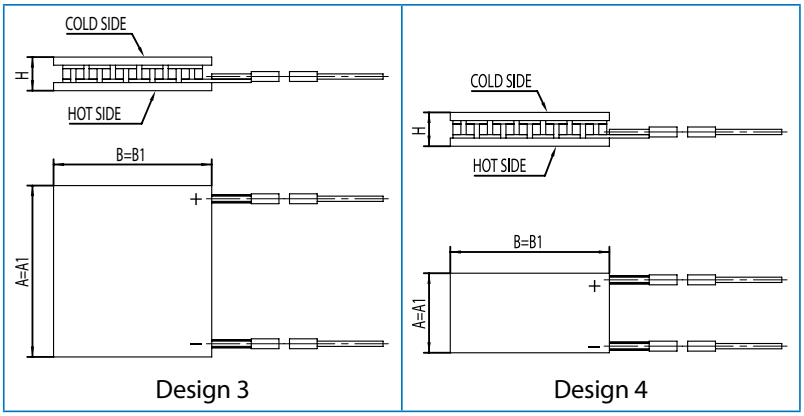
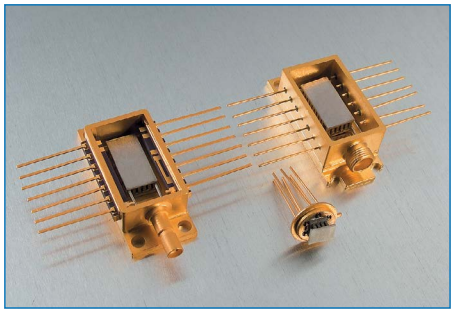
Miniature coolers for radio-electronics

Miniature thermoelectric coolers (TECs) are used for direct cooling (and freezing) and temperature stabilization of small size temperature-sensitive electronic components and devices. Such TECs could be installed into vacuum-processed cases.







Applications:

— input stages of low-noise amplifiers and receivers;
— optical communication laser diode;
— interferometer laser diode;
— microprocessors and critical microchips;
— PCBs and electronic units;
— infrared detectors;
— CCD- matrix, incl. night vision equipment;
— photomultipliers, photodetectors and other temperature sensitive elements and components of electronic devices.

Coolers could be directly integrated into the standard devices e.g. TO (TO3, TO8 etc), HHL, DIL, Butterfly or any other special enclosures.

Miniature coolers for radio-electronics

Type	Imax, (Amps)	Qmax, (Watts)	Umax, (Volts)	ΔTmax, (K)	Rac, (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-8-0,45-1,3	0,7	0,4	1,0	67	1,20	3,4	3,4	5,0	3,4	2,3	1
TB-12-0,45-1,3	0,7	0,6	1,4	67	1,80	3,4	5,0	5,0	5,0	2,3	
TB-18-0,45-1,3	0,7	0,9	2,2	67	2,80	5,0	5,0	6,6	5,0	2,3	
TB-32-0,45-1,3	0,7	1,7	3,9	67	5,00	6,6	6,6	8,3	6,6	2,3	
TB-66-0,45-1,3	0,7	3,5	8,0	67	10,0	9,1	9,9	11,5	9,1	2,3	
TB-7-0,6-1,5	1,1	0,6	0,9	69	0,59	4,3	4,3	4,3	4,3	3,25	2
TB-11-0,6-1,5	1,1	0,9	1,4	69	0,91	9,0	4,0	9,0	4,0	3,25	3
TB-17-0,6-1,5	1,1	1,4	2,1	69	1,50	6,3	6,3	6,3	6,3	3,25	2
TB-31-0,6-1,5	1,1	2,6	3,8	69	2,65	8,0	8,0	8,0	8,0	3,25	
TB-35-0,6-1,5	1,1	3,0	4,3	69	3,10	6,0	12,0	6,0	12,0	3,25	4
						12,0	6,0	12,0	6,0		3
TB-65-0,6-1,5	1,1	5,5	8,1	69	5,60	13,0	12,0	13,0	12,0	3,25	

Miniature coolers for radio-electronics

Type	Imax, (Amps)	Qmax, (Watts)	Umax, (Volts)	ΔTmax, (K)	Rac, (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-7-0,6-1,2	1,4	0,7	0,9	69	0,51	4,3	4,3	4,3	4,3	2,95	2
TB-11-0,6-1,2	1,4	1,2	1,4	69	0,75	4,0	9,0	4,0	9,0	2,95	4
TB-17-0,6-1,2	1,4	1,8	2,1	69	1,20	6,3	6,3	6,3	6,3	2,95	2
TB-31-0,6-1,2	1,4	3,3	3,8	69	2,05	8,0	8,0	8,0	8,0	2,95	
TB-35-0,6-1,2	1,4	3,7	4,3	69	2,40	6,0	12,0	6,0	12,0	2,95	4
						12,0	6,0	12,0	6,0		3
TB-65-0,6-1,2	1,4	6,9	8,1	69	4,60	13,0	12,0	13,0	12,0	2,95	3
TB-7-0,6-1,0	1,7	0,9	0,9	69	0,39	4,3	4,3	4,3	4,3	2,75	2
TB-17-0,6-1,0	1,7	2,2	2,1	69	0,95	6,3	6,3	6,3	6,3	2,75	2
TB-31-0,6-1,0	1,7	3,9	3,8	69	1,70	8,0	8,0	8,0	8,0	2,75	
TB-35-0,6-1,0	1,7	4,4	4,3	69	2,08	6,0	12,0	6,0	12,0	2,75	4
						12,0	6,0	12,0	6,0		3
TB-65-0,6-1,0	1,7	8,3	8,1	69	4,00	13,0	12,0	13,0	12,0	2,75	
TB-7-0,6-0,8	2,1	1,1	0,9	68	0,34	4,3	4,3	4,3	4,3	2,55	2
TB-17-0,6-0,8	2,1	2,6	2,1	68	0,76	6,3	6,3	6,3	6,3	2,55	
TB-23-0,6-0,8	2,1	3,6	2,8	68	1,45	6,0	8,5	6,0	10,5	1,95	1
TB-31-0,6-0,8	2,1	4,8	3,8	68	1,40	8,0	8,0	8,0	8,0	2,55	2
TB-35-0,6-0,8	2,1	5,4	4,3	68	1,70	6,0	12,0	6,0	12,0	2,55	4
						12,0	6,0	12,0	6,0		3
TB-65-0,6-0,8	2,1	10,1	8,0	68	3,00	13,0	12,0	13,0	12,0	2,55	
TB-109-0,6-0,8	2,1	16,9	13,4	68	5,00	12,0	26,0	12,0	26,0	2,55	4
TB-17-1,0-0,7	6,6	8,4	2,1	68	0,24	8,0	8,0	8,0	8,0	2,45	2

Standard and additional options for single-stage miniature coolers		
Description	**Notation (*)**	**Note**
Substrates material		
Alumina Al_2O_3 (BK-96)	-	Standard performance
Aluminium nitride (AlN)	**N**	Heat conductivity > 180 W/m·K
Operating and mounting temperatures		
Operating temperature up to 120 °C (standard), max Mounting temperature ≤ 130 °C**	**HT(120)**	Standard performance. Melting point of TEC's solder T=139°C
Operating temperature up to 150 °C, max Mounting temperature ≤ 170 °C**	**HT(150)*** **	Melting point of TEC's solder T=183°C (Pb-Sn)***
Operating temperature up to 200 °C, max Mounting temperature ≤ 220 °C**	**HT(200)**	Melting point of TEC's solder T= 232 °C
Parallelism and flatness of mounting surfaces		
Flatness 0,10 mm; Parallelism 0,15 mm	**L0**	Standard performance. Height tolerance ± 0,15 mm
Flatness 0,02 mm; Parallelism 0,03 mm	**L1**	Height tolerance ± 0,05mm
Flatness 0,015 mm; Parallelism 0,02 mm	**L2**	Height tolerance ± 0,015mm

To be continued on the **page 20**.

Metallization of cold and (or) hot sides		
Metallization of cold (mc) and (or) hot side of TEC with solder tinning	mc95, mh95, mm117 etc.	Melting temperatures 95 °C, 117 °C, 139 °C or 183 °C
Gold plating	mcAu, mhAu, mmAu	0,2-1 micron thickness
Other standard and additional options		
Sealants: epoxy, silicon, urethane, conformal coating	**E, S, U, Cc**	Standard performance is without sealant
Tolerance of Rac value of : TEE with length of the edge>0,45 mm TEE with length of the edge ≤ 0,45 mm		±10% ±15%
Tolerance of length (dimensions A, A1) and width (dimensions B, B1)		+0,5/–0,2mm
Type and length of wires (standard length 50 mm)	-	Up to customer's requirements
TEC could be mounted into electronic enclosures e.g. TO, HHL, DIL, Butterfly, etc.	-	
Assembling into arrays		
Connectors attachment		

(*) - the notations shown are used to notate additional options in TEC's name (please refer to System of Notation section below);
(**) - the maximum mounting temperature influence on the TEC must not exceed 2 minutes;
(***) - attention! This option does not meet ROHS requirements.

System of notation:

A universal abbreviation is used to notate single-stage miniature TECs:
TB-N-C-h, where:

TB — product abbreviation — thermoelectric battery (TEC);
N — number of thermocouples in the TEC;
C — length of the edge of the thermoelectric element basis (in millimeters);
h — height of the thermoelectric element (in millimeters).

For example: TB-109-0,6-0,8 HT(200) mmAu N denotes: thermoelectric battery (TEC), composed of 109 thermocouples (218 thermoelectric elements), each element has the cross-section of 0,6×0,6 mm and is of 0,8 mm high, ceramics plates material is aluminium nitride. TEC can operate at temperatures up to 200°C, both ceramic plates have golden coating.

Enviromental Safety Features:

The thermoelectric coolers do not contain lead or any other forbidden material according to RoHS directive requirements.

RoHS