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**THERMOELECTRIC
COOLING
MODULE ALTEC-027
40 X 40 MM**



- The module is intended for creation of required temperature cooling conditions, thermostating or heating in different products with thermoelectric cooling, thermostating or conditioning.
- Commonly used module for development of household appliances, conditioners, medical equipment, measuring instruments, metrology, other goods and devices.
- The module is a modification of a known and widely used module with ceramic plates of 40x40 mm and with 127 couples of legs.
- The module's cooling capacity is 1.5 times larger in comparison with standard 40x40 mm modules. Two modules Altec-027 can replace three 40x40 mm standard modules in cooling capacity. And the cost of Altec-027 module is almost equal to the cost of standard 40x40 mm module. Thus, using Altec-027 module the customer may have actual cost reduction almost by a factor of 1,5.
- The module offers improved characteristics of reliability and stability to various effects.
- The module has been designed on the basis of the latest technological achievements of the Institute of Thermoelectricity, National Academy of Science, Ukraine.
- In designing the module use has been made of the latest theory of thermoelectric modules reliability developed in the Institute of Thermoelectricity, National Academy of Science, Ukraine.
- In designing the module use has been made of the results of extensive reliability tests of modules conducted by the Institute of Thermoelectricity, National Academy of Science, Ukraine, during the recent 25 years.
- Technologies of the Institute of Thermoelectricity were marked with the "International Golden Award for Technology and Quality".
- The module utilizes high-quality Al_2O_3 ceramic plates.

- The module utilizes commutating copper plates with anti-diffusion coatings.
- The module utilizes high quality thermoelectric materials of own production based on *Bi-Te-Se-Sb*. The materials have small-angle controlled unit crystal disorientation that provides high figure of merit combined with increased mechanical strength.
- The module utilizes multi-layer anti-diffusion barriers 25 μ m thick providing high reliability and long service life.
- The modules utilize plastic commutating solders with controlled thickness which provide high resistance to cyclic temperature effects.
- The modules utilize special configuration of ceramic plates providing high resistance to cyclic temperature effects.
- The modules utilize efficient technologies for leg material joining with anti-diffusion barriers. The engagement strength reaches the leg material strength.
- The modules utilize highly efficient silicone sealants which have undergone multi-year tests under conditions of outer space, elevated humidity, etc.
- According to customer's wish, the outside surfaces of ceramic plates may have metallization and be coated with solder. In this case the modules can be attached to cooled objects and heat sinks by soldering. With such attachment heat losses because of thermal resistances at points of modules attachment become negligible.
- Basic parameters of modules:
 - dimensions:
a = 40 mm; b = 40 mm; c = 3,6 mm (See Fig.1);
 - max.operating voltage $U_{\max} = 15$ V;
 - max. operating current $I_{\max} = 8.6$ A;
 - operating temperature range 200-420 K;
 - max.cooling performance at 300 K $Q_o=75$ W;
 - max.temperature difference at ceramics hot side temperature $T_h=300$ K is $\Delta T_{\max}=71\pm 2$ K;
 - input leads length $l = 150$ mm;

- length of leads without insulation $l_0=10$ mm

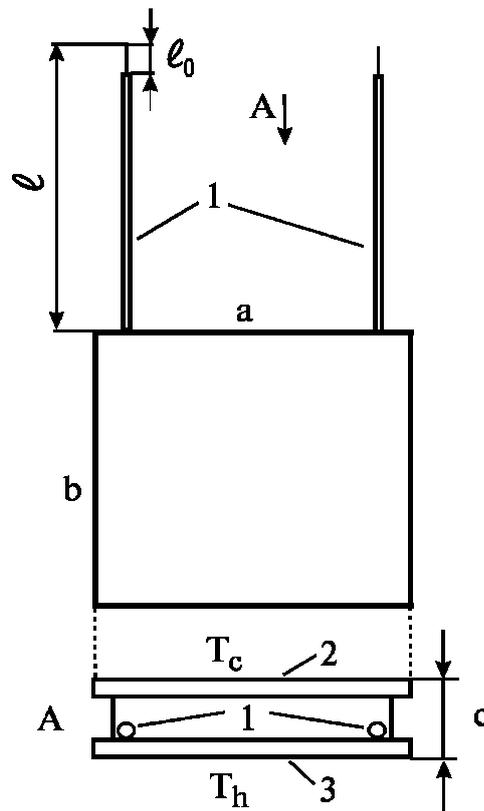


Fig.1. Diagram of a thermoelectric module

1 - electric leads;

2 - cold ceramics;

3 - hot ceramics;

T_c - temperature of ceramic plate outside surface without leads 1;

T_h - temperature of ceramic plate outside surface with leads 1;

- Additional module parameters and information about reliability is presented at customer's request.
- Prices for a module depending on the order volume are sent at customer's request.
- Module's characteristics are given in Fig.2.

Orders for modules and additional information:

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Additional information can be found on the page in Internet:

www.ite.cv.ua/altec

Characteristics of thermoelectric module Altec-027

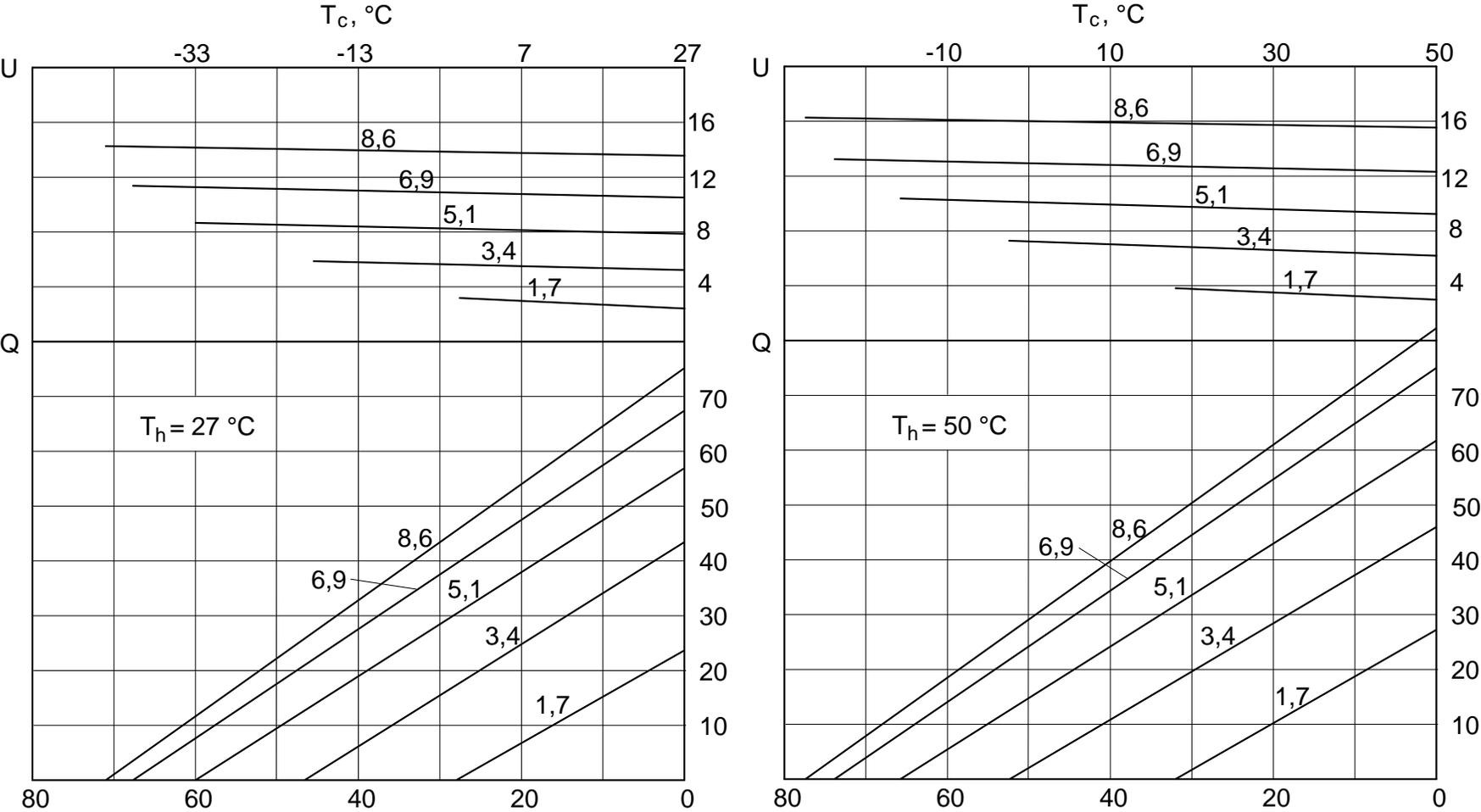


Fig.2