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THERMOELECTRIC COOLING MODULES

ALTEC-98A, ALTEC-98B, ALTEC-98C

- The module is intended for providing the required temperature cooling modes for miniature semiconductor devices, lasers, diodes, etc.
- The module offers improved characteristics of reliability and stability against various effects.
- The module is based on recent technological achievements of Institute of Thermoelectricity of National Academy of Sciences of Ukraine.
- The module is designed on the basis of the latest theory of thermoelectric modules reliability developed by Institute of Thermoelectricity of National Academy of Sciences of Ukraine.
- The module is designed on the basis of the results of extensive modules reliability tests carried out by Institute of Thermoelectricity over a period of the last 25 years.
- Technologies of Institute of Thermoelectricity were marked in 1999 by the “International Golden Award for Technology and Quality”.
- The module utilizes high-performance ceramic plates of Al_2O_3.
- The module utilizes connecting copper plates with anti-diffusion coatings.
- The module utilizes high-performance home-made thermoelectric materials based on *Bi-Te-Se-Sb*. The materials have a small-angle controlled unitized crystalline misorientation to provide their high figure of merit combined with increased mechanical strength.
- The module utilizes efficient multi-layered anti-diffusion barriers 25μkm thick to provide high reliability and long service life.
- The module utilizes plastic connecting solders of controlled thickness to provide high module stability against cyclic temperature effects.
- The module utilizes efficient techniques of legs material bonding to the anti-diffusion layers. Their engagement strength is as great as the strength of legs material.
- The working surface of the cold and warm ceramics is metal-coated.

- **Basic parameters of module Altec-98A:**
  - dimensions of modules (Fig.1):
  - a = 8mm, b = 8mm, c = 1.65mm;
  - maximum operating voltage U_{max} = 3.9V;
  - maximum operating current I_{max} = 1.8A;
  - maximum cooling power at 300 K Q_{max} = 3.6W;
  - maximum temperature difference at hot ceramics surface temperature T_h = 300K is equal to ΔT_{max} = 72 ±2K;
  - length of lead wires l = 50mm;
  - length of lead wire part without insulation l_0 = 5mm.

- **Basic parameters of module Altec-98B:**
  - dimensions of modules (Fig.1):
  - a = 8mm, b = 8mm, c = 1.65mm;
  - maximum operating voltage U_{max} = 3.9V;
  - maximum operating current I_{max} = 2.8A;
  - maximum cooling power at 300 K Q_{max} = 5.6W;
  - maximum temperature difference at hot ceramics surface temperature T_h = 300K is equal to ΔT_{max} = 72 ± 2K;
  - length of lead wires l = 50mm;
  - length of lead wire part without insulation l_o = 5mm.

- **Basic parameters of module Altec-98C:**
  - dimensions of modules (Fig.1):
  - a = 8mm, b = 10mm, c = 1.65mm;
  - maximum operating voltage U_{max} = 4.9V;
  - maximum operating current I_{max} = 2.8A;
  - maximum cooling power at 300 K Q_{max} = 7.0W;
  - maximum temperature difference at hot ceramics surface temperature T_h = 300K is equal to ΔT_{max} = 72 ± 2K;
  - length of lead wires l = 50mm;
  - length of lead wire part without insulation l_o = 5mm.

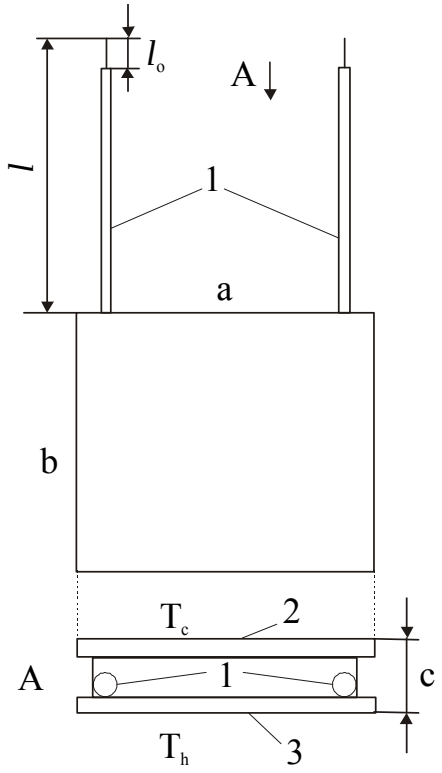

Fig.1 Diagram of thermoelectric module:

1 – lead wires; 2 – cold ceramics; 3 – hot ceramics;
T_c – temperature of the outside surface of ceramic plate without lead wires l;
T_h- temperature of the outside surface of ceramic plate with lead wires.

- Additional module parameters and information about reliability are presented at customer's request.
- Prices for the module according to the order amount are sent at customer's request.
- The characteristics of the module are given in Figs. 2, 3, 4.

Orders for the modules and additional information:

E-mail:ite@cv.ukrtel.net,

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For additional information please go to Internet page http://ite.cv.ukrtel.net/altec.

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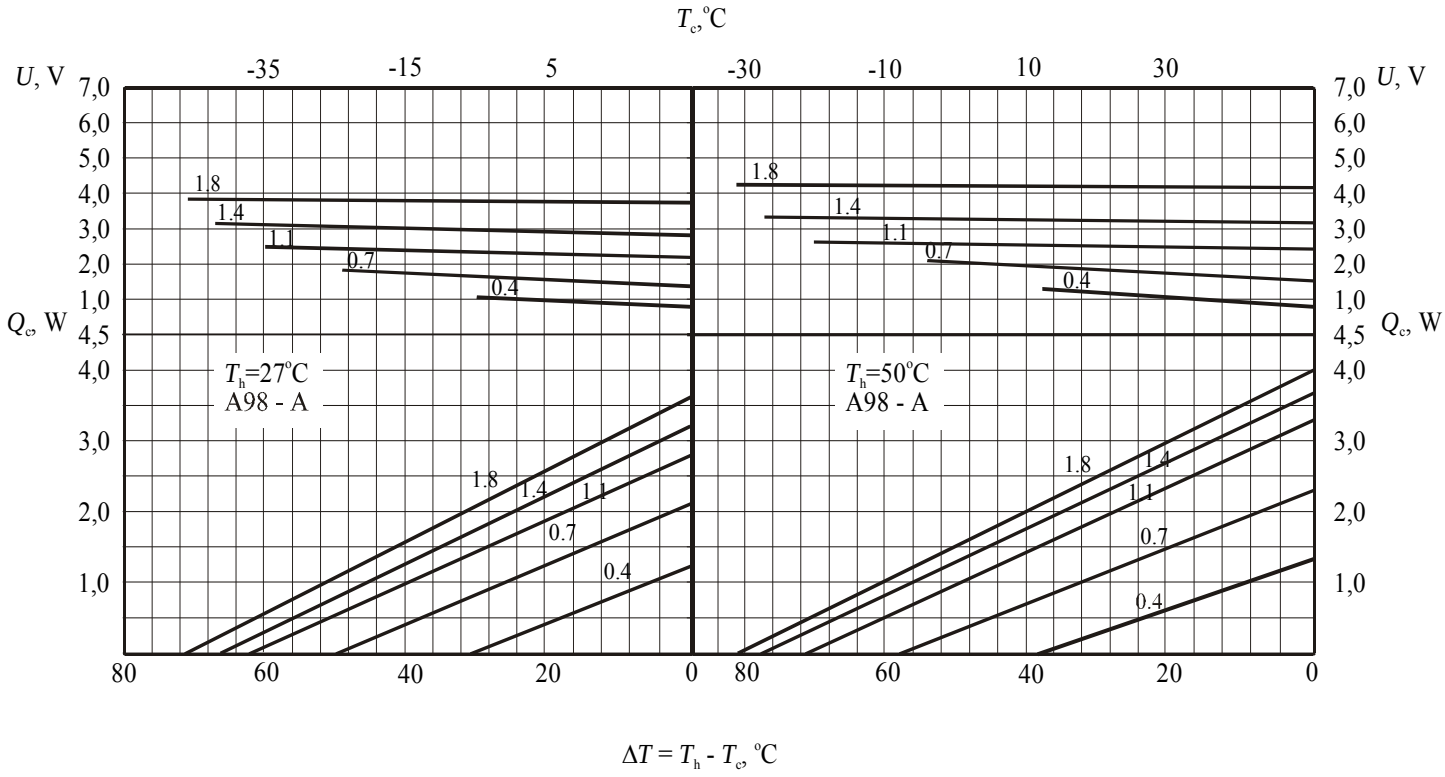
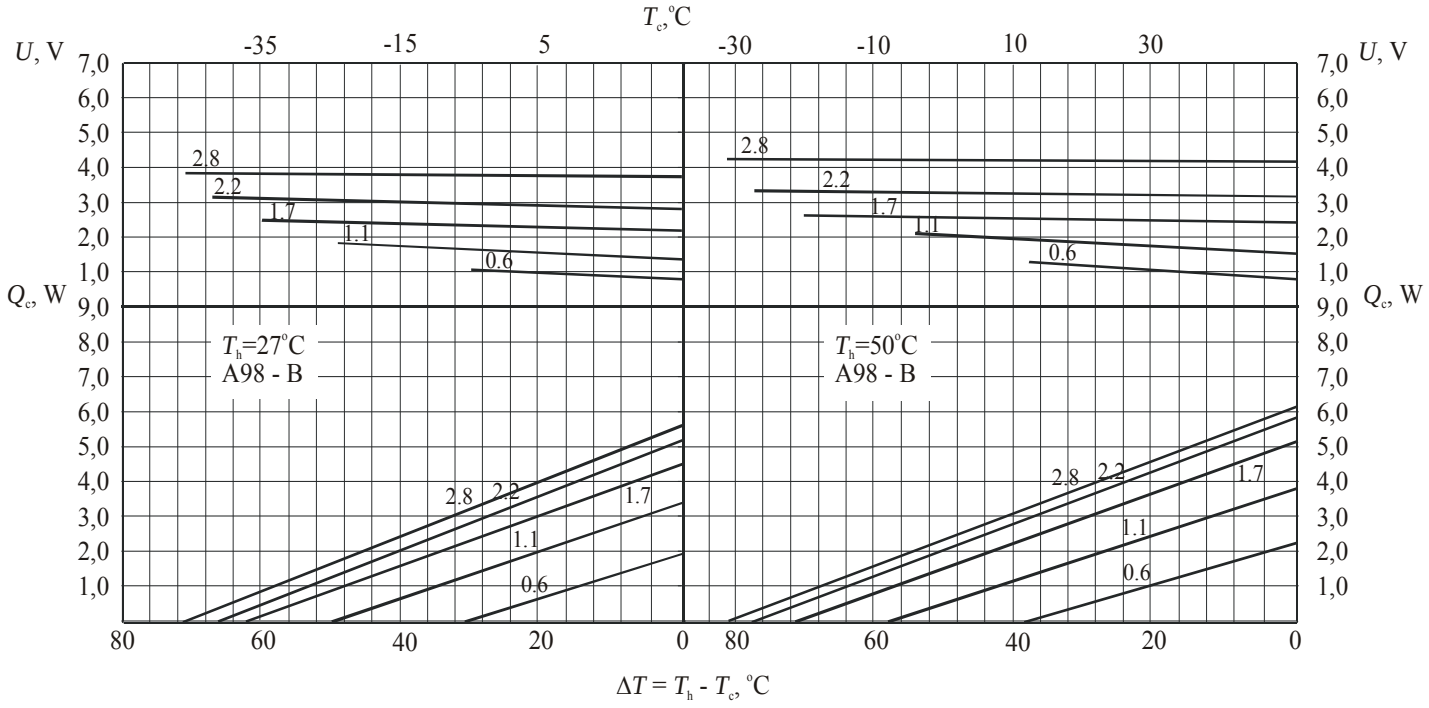
Characteristics of thermoelectric module Altec-98A



$\Delta T = T_h - T_c$, °C

Fig. 2

Characteristics of thermoelectric module Altec-98B



$\Delta T = T_h - T_c$, °C

Fig.3.

Characteristics of thermoelectric module Altec-98C

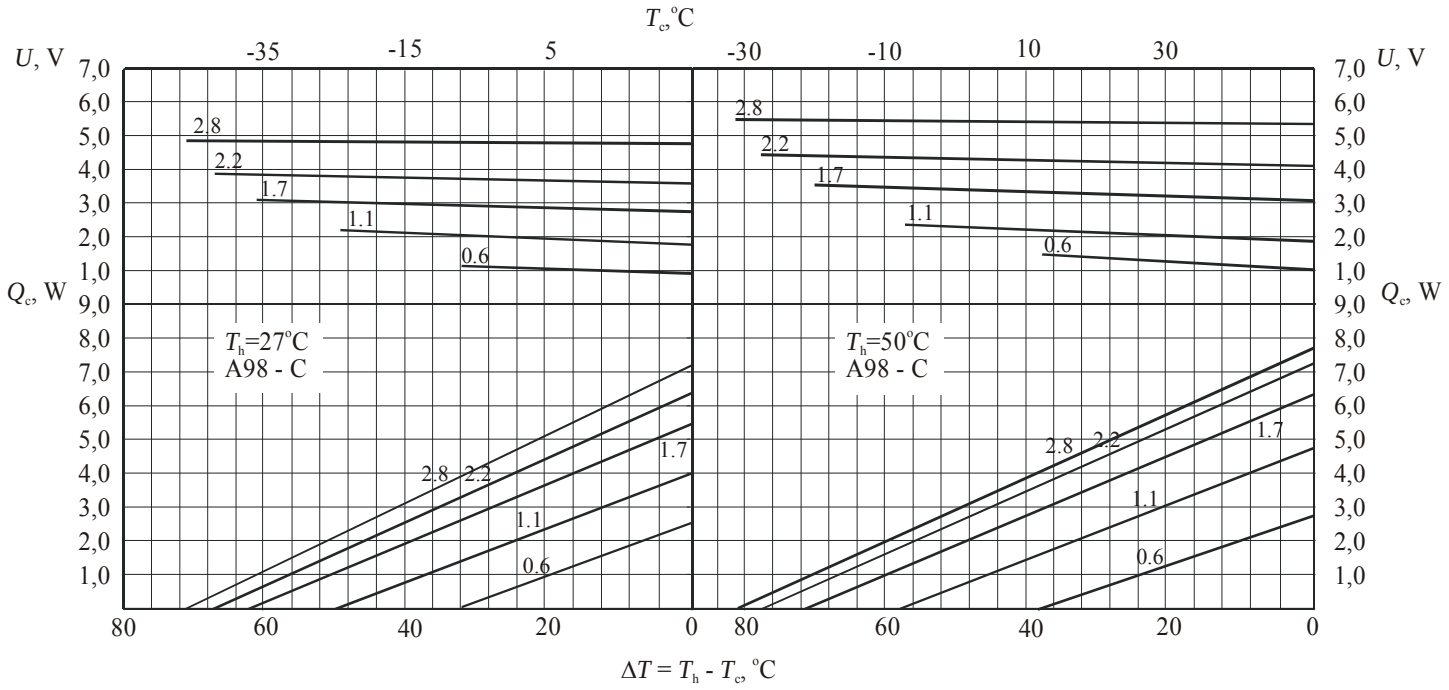


Fig.4.