



## ORDER DESCRIPTION

### 1. Object of the contract

The subject of the contract is a delivery of thermoelectric coolers with the service of mounting to the headers provided by the Ordering Party

No	Product name	Qty
1.	TO812.4MD04-116-10 4-40 UNC	20

### 2. Parameters

#### 2.1. Technical specification

4 stage cooler	
$\Delta T_{max}$ [K]	127±3
$Q_{max}$ [W]	0.29 ±0.04
$I_{max}$ [A]	0.5±0.1
$U_{max}$ [V]	8.40±0.8
H[mm]	6.90±0.3
H' [mm]	6.90±0.35
Dimensions of top stage	2.6 x 2.6 ±0.1
ACR (TEC on the header)[ $\Omega$ ]	14.9±1.49
Ceramics	Al <sub>2</sub> O <sub>3</sub>
TEC assembly solder	Top stage lapped
Electrical wires	Soldering min. 230°C, RoHS
Soldering electrical wires to TEC	Non-isolated AWG-30 wires
	Soldering min. 230°C, RoHS
TEC/header pinout	(+) – pin 2 (-) – pin 8
*Centering error [mm]	Less than 0.2 mm
Mounting the TEC to the TO8 header	Soldering, 206°C RoHS, TEC cannot have solder on stages.
**Maximal process temperature	150C

Performance data are given at 300K, vacuum

Tolerances in a batch should not exceed more than ±5%-add to LOT spec ACR value of measuring equipment

\* The maximum allowed distance between the centre of the coolers top stage and the centre of the TO8 header



*\*\* The maximum temperature to which the TEC may be exposed during the manufacturing process (for more than 15 minutes)*

## 2.2. Reliability

Mechanical Shock	The test shall be performed according to MIL-STD-883 (Method 2002.4, Condition B). TECs are subjected to 1500 g level shock for pulse duration of 0.5 ms both directions in all three axis.
Vibration	The test shall be performed according to MIL-STD-883 (Method 2007.3, Condition A). TECs under the test are vibrated at variable frequency sequence (controlled from 20 to 2000 Hz and back down 20 Hz) four times in all three axis, peak acceleration of 20 g.
Shear Force	The test shall be performed according to MIL-STD-883 (Method 2019).
High Temperature Storage	The test shall be performed for a minimum of 2000 hours at the TEC maximum-rating storage temperature.
Temperature Cycling	The test shall be performed according to MIL-STD-883 (Method 1010.8, Condition B). TECs are alternately exposed to environment temperatures of -55°C and +125°C with holding time of 10 minutes at each temperature. The test shall be performed for at least 100 cycles.
Thermal Shock	The test shall be performed according to MIL-STD-883 (Method 1011.9, Condition A). TECs are alternately immersed in water kept at 0°C and +100°C with a 5 minute holding time at each temperature. This cycle is repeated 20 times.
Intermittent Life	The test shall be performed according to MIL-STD-883 (Method 1006). The test shall be performed with ambient temperature equal to or greater than maximal operation temperature (i.e. 85°C). The TECs shall be cycled on and off for minimum of 5000 cycles. The duty cycle is 1.5 minutes on (during this time the TEC should reach at least 90% of DTmax) and 4.5 minutes off.
Steady State Life	The test shall be performed according to MIL-STD-883 (Method 1005.8). TECs are subjected to 125°C for a period 1000 hours while being powered by the maximum rated current.

## 2.3. Work conditions

- Ambient temperature – 297K
- Cold side heat load - <50 mW (passive heat load from convection, passive component on the cooler, conductivity of gold wires – 4 pcs,  $\Phi$ 25  $\mu$ m, length approx. 6 mm, mounted to the header pins)
- Hot side – radiator with thermal paste
- Atmosphere – Xe gas
- Top stage temperature – <195K (Xe)