

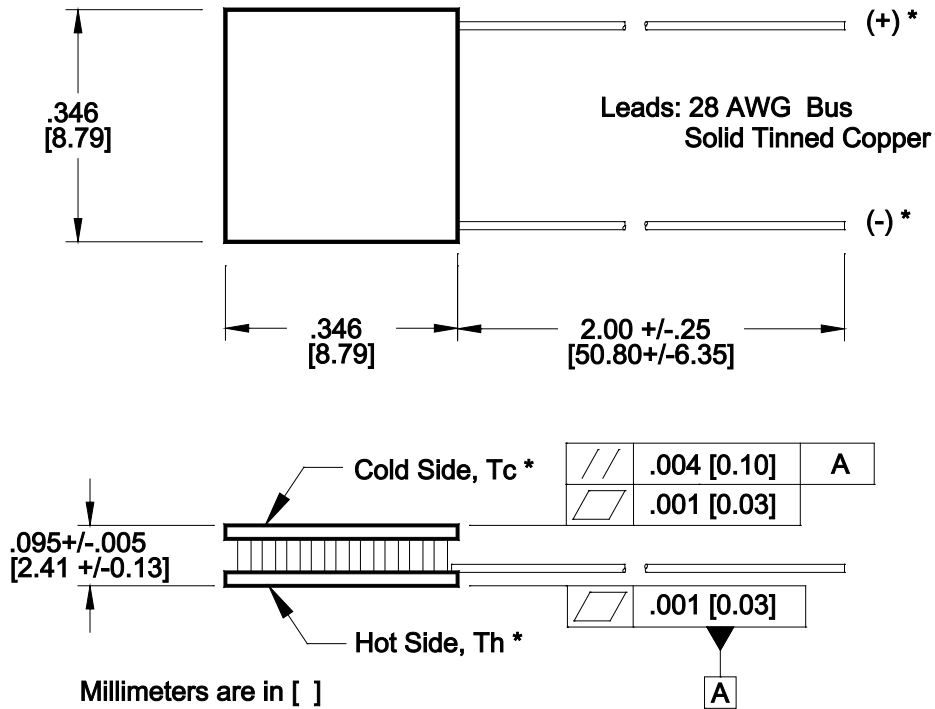
## NL1012T

Single-Stage Thermoelectric Module  
RoHS EU Compliant

### TYPICAL PERFORMANCE VALUES

Hot Side Temperature (°C)	27°C	50°C
Δ Tmax (°C-dry N <sub>2</sub> ):	61	68
Qmax (watts):	2.1	2.4
I <sub>max</sub> (amps):	1.0	1.0
V <sub>max</sub> (vdc):	3.7	4.2
AC Resistance (ohms):	3.24	--
Device ZT	0.77	--

### MECHANICAL CHARACTERISTICS



**\* NOTE: Cold Side, Hot Side, and Positive and Negative Leads are valid only for thermoelectric cooling. For power generation, refer to page 3.**

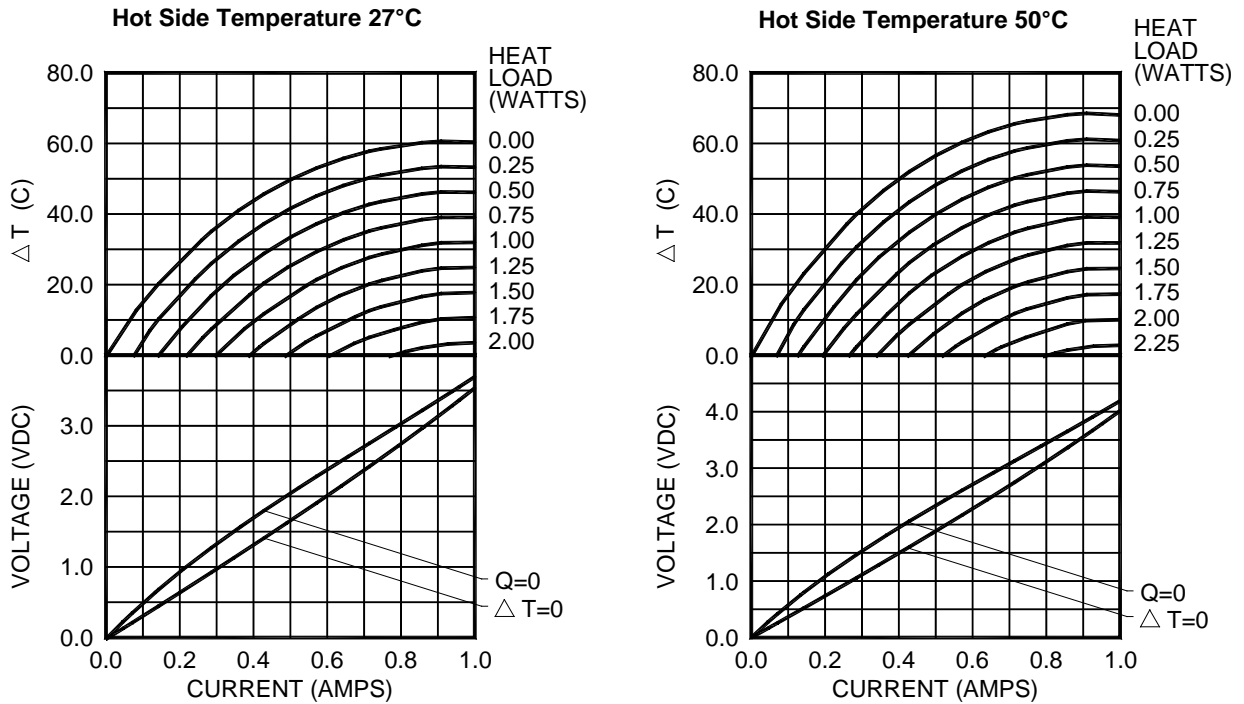
### ORDERING OPTIONS

Model Number	Description
NL1012T-01AC	TEM, Top and Base Metallized Exterior
NL1012T-02AC	TEM, Base Metallized Exterior
NL1012T-03AC	TEM, No Metallized Exterior
NL1012T-04AC	TEM, Top and Base Pre-Tinned with 117°C Solder.

### AVAILABLE MODIFICATIONS

- Maximum operating temperature is 85°C.
- Maximum process temperature is 120°C.
- Ceramic Material: Aluminum Oxide
- Metallized Exterior Surfaces are Au flash, suitable for soldering.
- Height dimension includes metallization and excludes solder.

ENVIRONMENT: ONE ATMOSPHERE DRY NITROGEN



For performance information in a vacuum or with hot side temperatures other than 27°C or 50°C, contact one of our Applications Engineers at 877-627-5691. Marlow reserves the right to make product changes without notice.

**Installation**

Recommended mounting methods: Bonding with thermal epoxy or soldering with metallized ceramics. For additional information, please refer to our TEC Installation Guide.

**Operation Cautions**

For maximum reliability, storage and operation below 85°C in a non-condensing environment is recommended. To minimize thermal stress when operating in cooling mode, use linear/proportional temperature control or a similar method rather than an ON/OFF method.

**CONTACT US:**

For customer support or general questions please contact a local office below or visit our website at [www.marlow.com](http://www.marlow.com).

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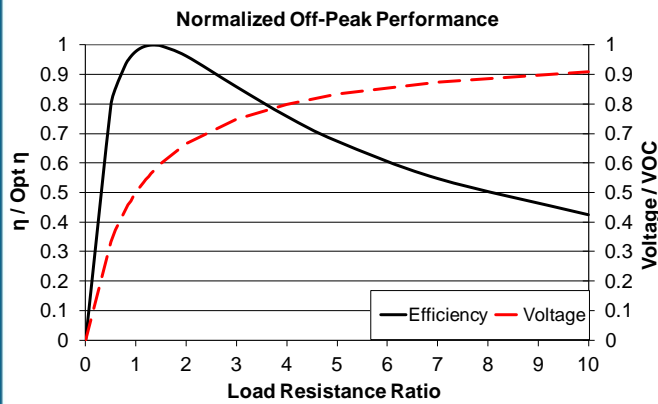
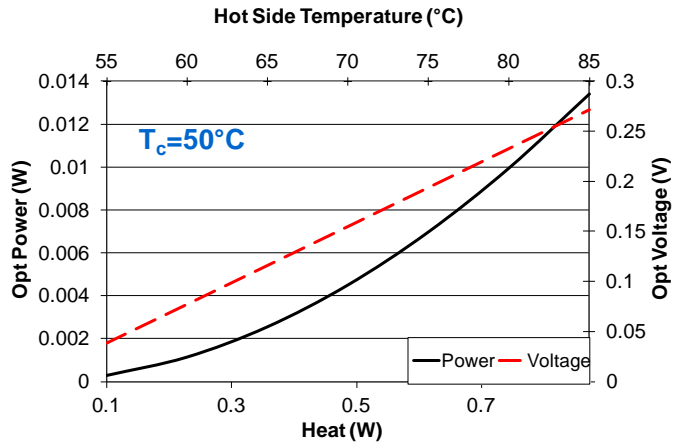
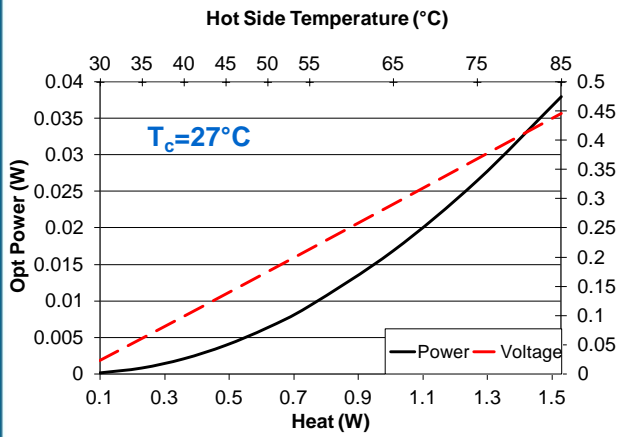
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POWER GENERATION PERFORMANCE CURVES



Hot Side Temperature (°C)	85	55	35
Cold Side Temperature (°C)	27	27	27
Optimum Efficiency, $\eta$ (%)	2.52	1.28	0.37
Optimum Power (W)	0.038	0.009	0.001
Optimum Voltage (V)	0.446	0.213	0.060
Load Resistance for Opt $\eta$ ( $\Omega$ )	5.23	4.88	4.65
Open Circuit Voltage, VOC (V)	0.78	0.37	0.11
Short Circuit Current (A)	0.20	0.10	0.03
Thermal Resistance (°C/W)	38.51	38.56	38.50

Power Generation performance information is given in a nitrogen environment and cold side temperatures of 27°C and 50°C. Module temperature does not include thermal resistance of heat sinks. For performance information in vacuum, other cold side temperatures, or specific heat sinks, consult one of our applications engineers.

TYPICAL POWER GENERATION CONFIGURATION

EXAMPLE:

