

# ALL ELECTRONICS CORP

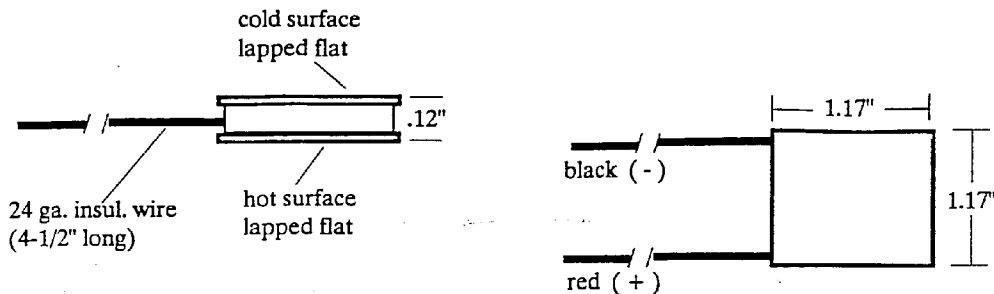
CAT# PJT-1

ORDER TOLL FREE

888-826-5432

## THERMOELECTRIC HEAT PUMP PELTIER JUNCTION

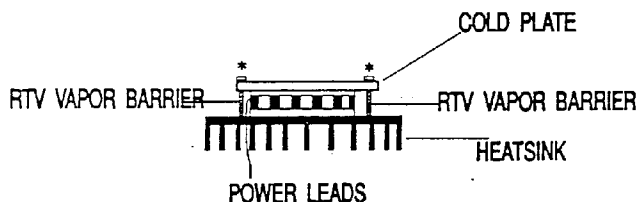
small peltier junction



Thermoelectric coolers are solid state heat pumps. Heat is "pumped" from the cold surface to the hot surface when a DC current is applied to the device. A heat sink is required on the hot surface to effectively remove the heat pumped from the cold surface. It is possible to obtain a no-load temperature differential of up to 65 degrees C with efficient heat removal.

The two greatest concerns for reliability are overheating and breakage. Remember that the junction surface are of a ceramic material and are easily broken. Heat generated by the pumping action must be removed with an appropriate heat sink.

The modules will operate with voltages from 3 to 12 volts. It is important to remember at a higher voltages with the resulting increase in current, the heat sink must be of appropriate size.



NOTE: COLD PLATE 1/8" COPPER OR 1/4" ALUMINUM MINIMUM THICKNESS. COAT BOTH SIDES OF JUNCTION WITH A THIN LAYER OF HEAT SINK COMPOUND

\*BOLTS USED TO ASSEMBLE MODULES MUST PROVIDE INSULATION BETWEEN HOT AND COLD SIDE. NYLON HARDWARE OR INSULATING WASHERS MAY BE USED.

## TB-127-1.0-1.3 THERMOELECTRIC MODULE SPECIFICATIONS

### 1.MECHANICAL

Lenght	30mm
Width	30mm
Thickness:	3.8mm+/-0.03mm
Parallelity:	+/-0.02mm
Geometry factor (G):	7.69E-02
Number of thermocouples (N):	127

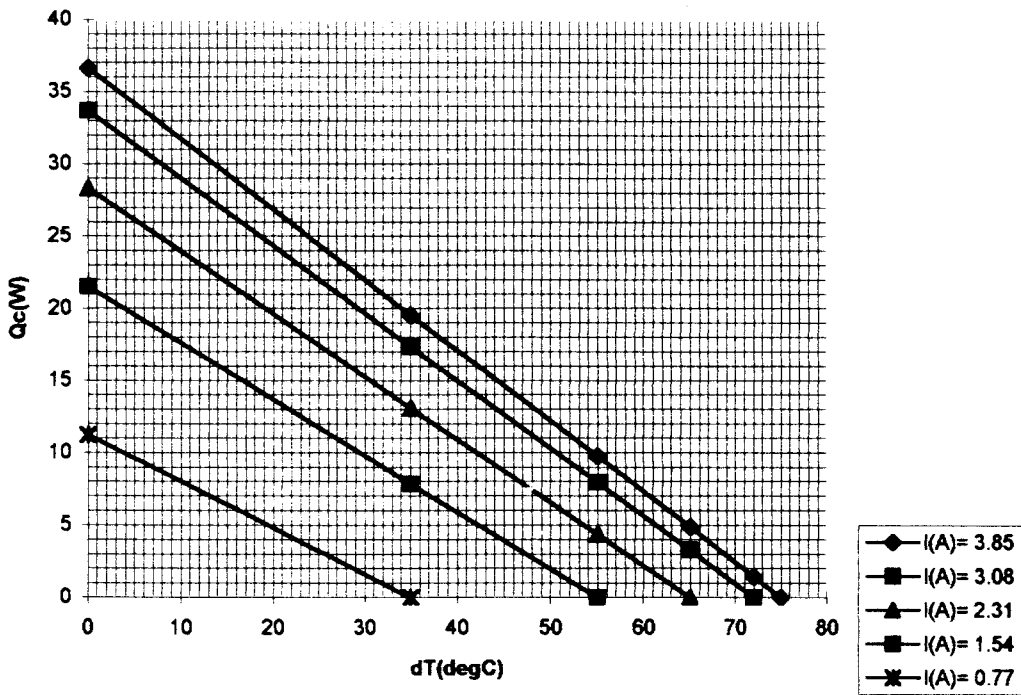
### 2.THERMAL AND ELECTRICAL (at Th=300 Degrees Kelvin)

Maximum current(I <sub>max</sub> ):	3.9A
Maximum voltage(V <sub>max</sub> ):	15.4V
Q <sub>max</sub> :	33.4W
dT <sub>max</sub>	69deg K

dT<sub>max</sub>: Maximum attainable temperature difference between the hot and the cold faces of the module at zero pumped heat Q.

Q<sub>max</sub>: Maximum heat that the module can pump from the cold to the hot face at zero temperature difference dT between the faces.

Th=50degC, max dT=75degC



Th=65degC, max dT=80degC

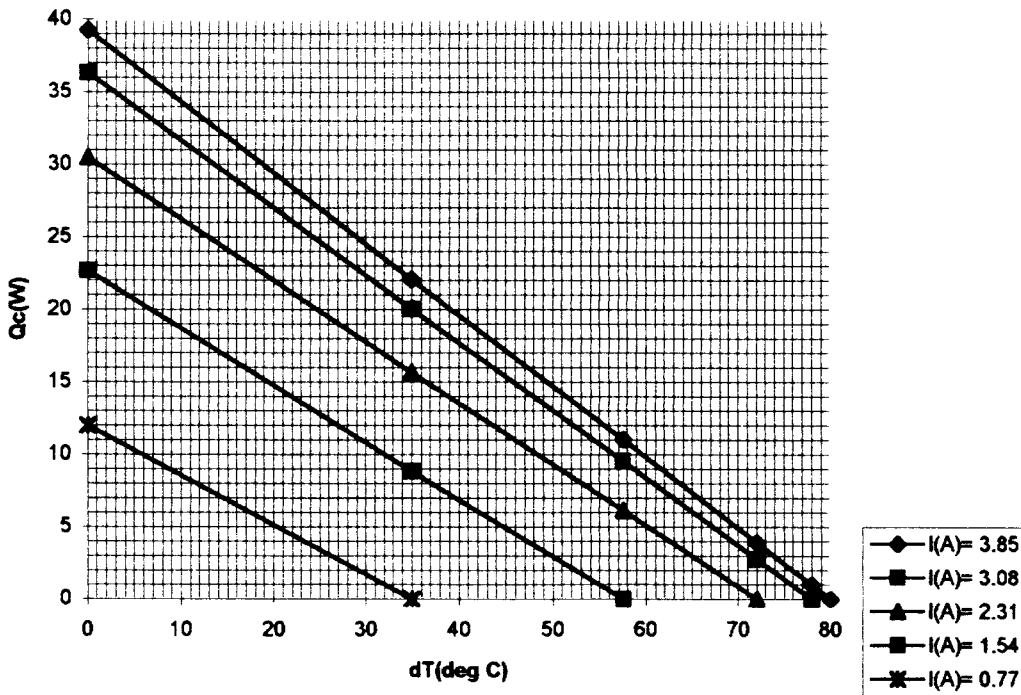


Fig. 1 Pumped Heat vs.  $\Delta T$  for Tb-127-1.0-1.3 Module

$T_h=65\text{degC}$ , max  $\Delta T=80\text{degC}$

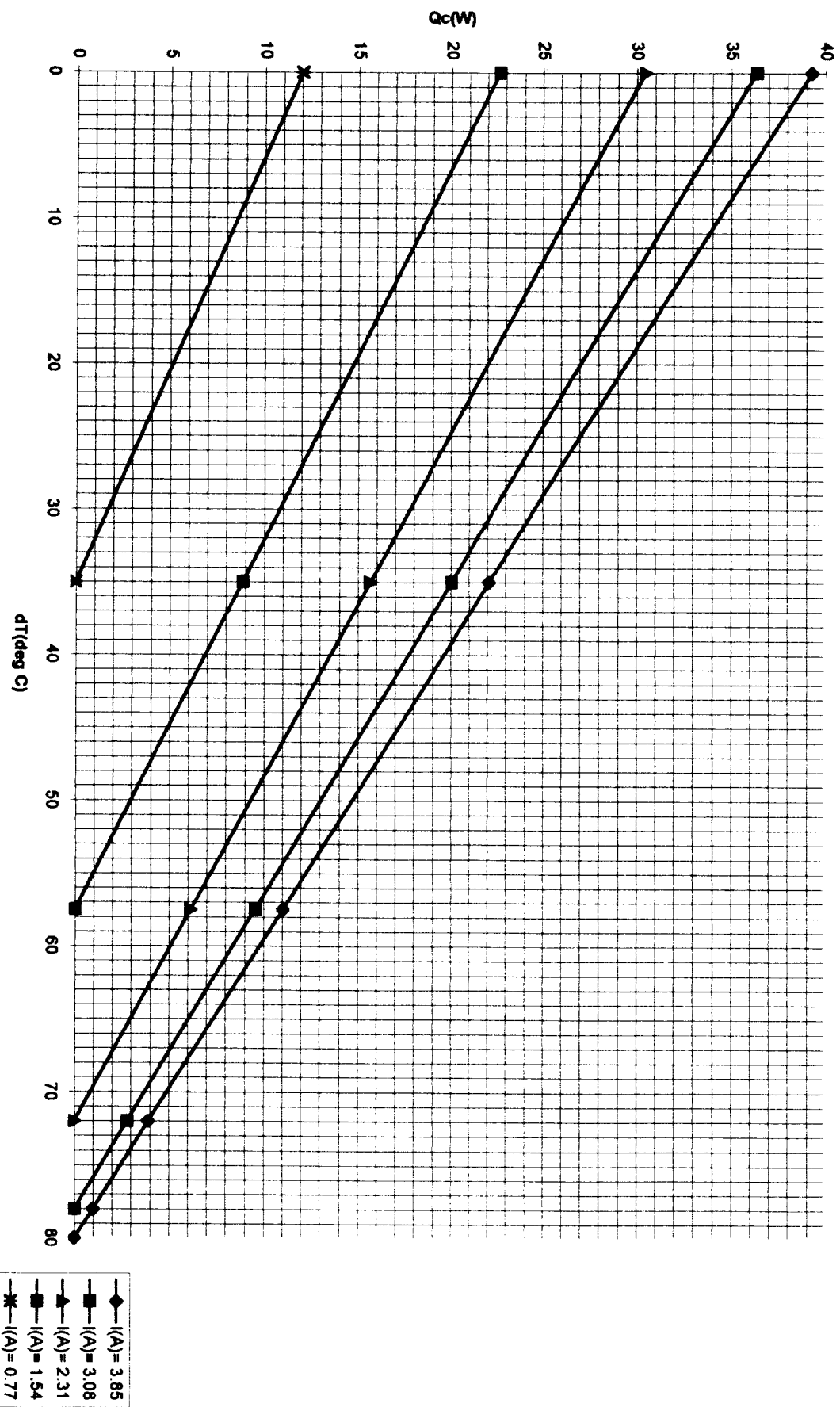
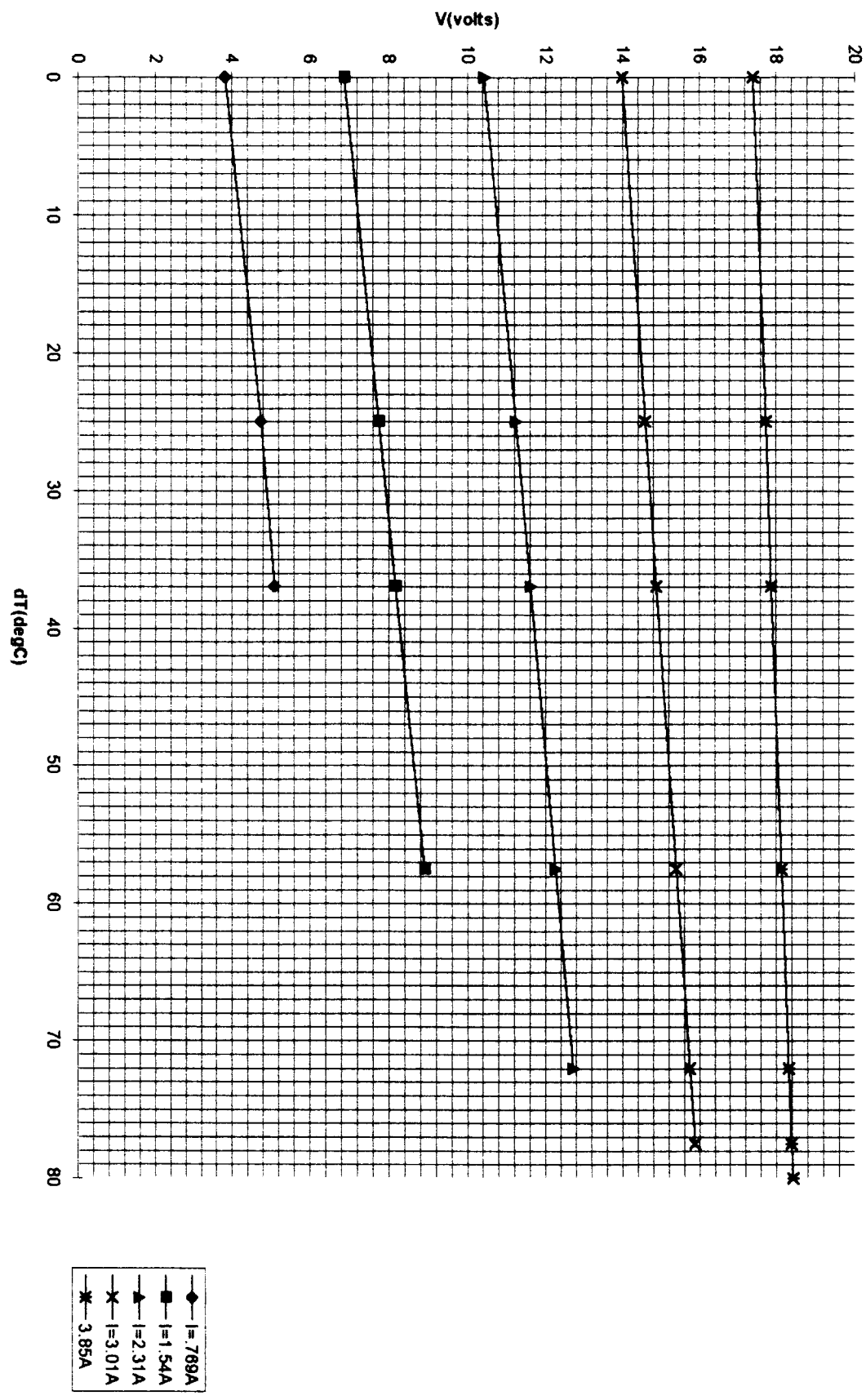
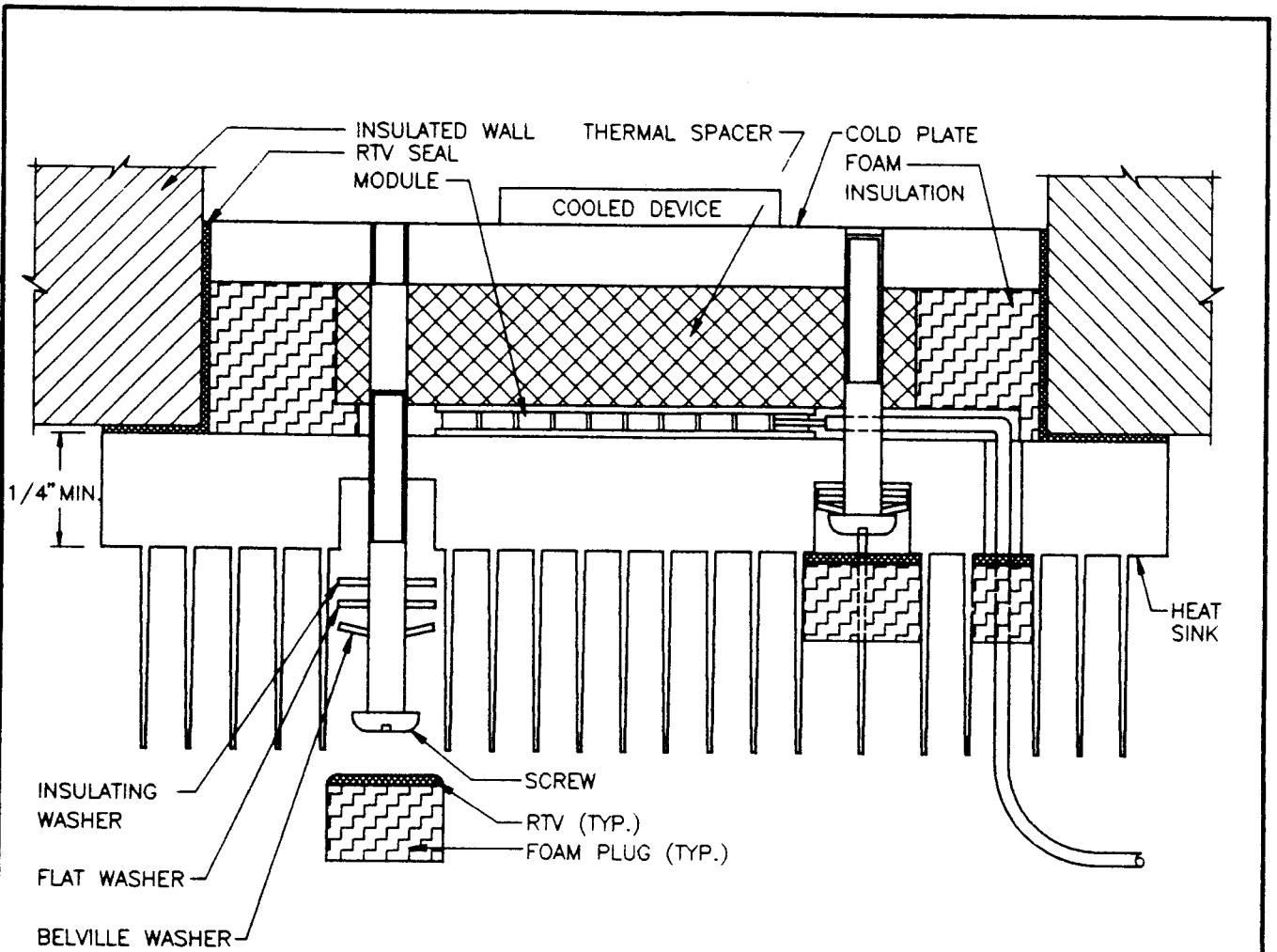


Fig. 2 Voltage vs. dt  
for TB-127-1.0-1.3 Module

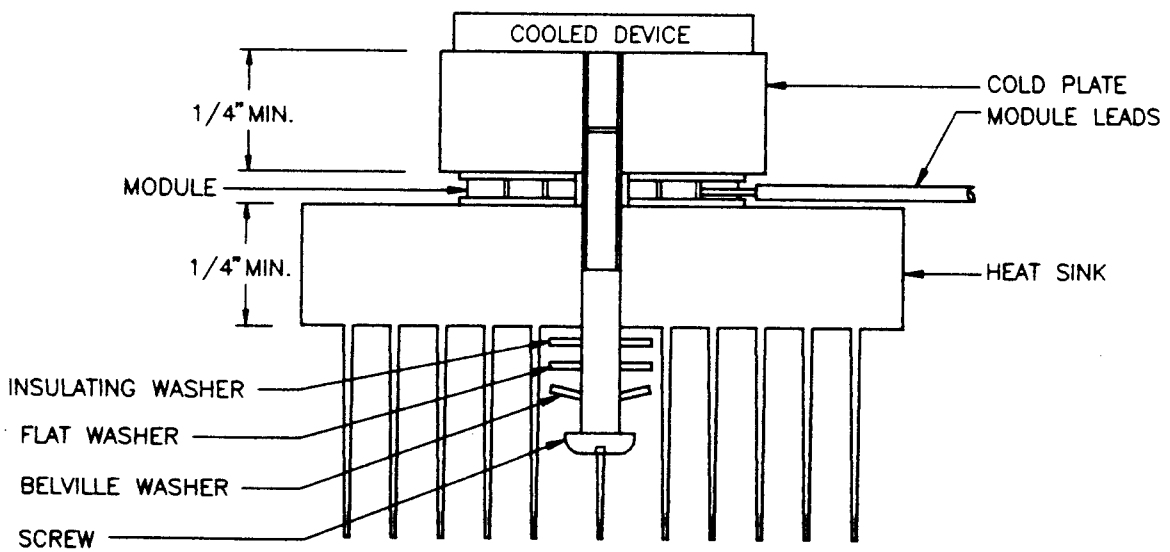
Th=65degC, max dt=80degC



**Fig. 3 Recommended Assembly Procedures**



**ASSEMBLY-HIGH TEMPERATURE DIFFERENTIAL APPLICATION**



**ASSEMBLY-LOW TEMPERATURE DIFFERENTIAL APPLICATION**

## **APPLICATION NOTES**

1. In order to obtain the highest reliability for the thermoelectric modules, the temperature of modules should not exceed 65 deg C on a continuous basis and 85 deg C for short time (seconds).
2. The leads supplied with the devices are attached at the factory using a special low temperature solder alloy (125 deg C). Do not attempt to unsolder or solder the leads, as common soldering irons and alloys will overheat the devices and can cause permanent damage.
3. Do not power the modules unless they mounted on an appropriate heat sink. For best thermal performance and reliability, follow the assembly guidelines shown in fig. 3.