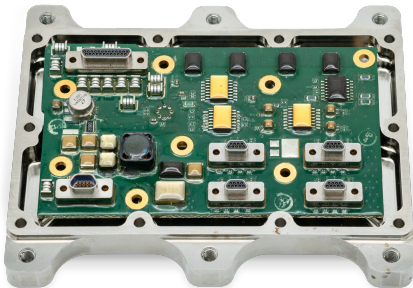
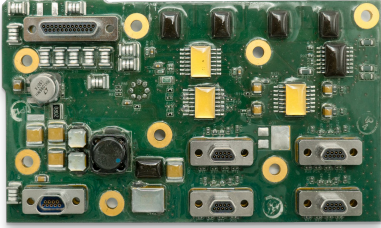


TCE



Thermal Control Electronics Rated for use in GEO orbit

Second Order Effects' Thermal Control Electronics (TCE) provides a reliable, configurable solution for precision thermal management in demanding environments. Designed with a channelized architecture, each channel integrates an independent heater driver, temperature sensor interface, and externally configurable setpoint to enable localized, closed-loop thermal control. The system automatically actuates heater outputs when measured temperatures fall below the defined setpoint and disables them once a configurable hysteresis threshold is exceeded, ensuring stable and efficient temperature regulation.

TCE supports 2-wire RTDs for accurate temperature sensing and can be tailored pre-manufacturing with customizable hysteresis to meet specific mission requirements.

Features

- 4 heater channels
- No onboard software
- Rated output power per channel: 20 W
- Redundant, wide-range logic power inputs: 24-38 V
- Hardware configurable temperature setpoint per channel
- Direct connection from power pin to heater
- Individual power inputs for each heater channel
- Design de-rated to NASA EEE-INST-002*
- Qualified to MIL-STD 461, SMC-S-016*

*Design standards are set to specific design (alterations available, but will require re-qualification)

Summary

Electrical characteristics at $T_{AMB} = 25^{\circ}C$

Symbol	Parameter	Min	Typ	Max	Units
V_{CC}^1	Input Voltage	24	28	38	Volts
I_Q	Quiescent Current ($V_{IN} = 28V$)	--	35	50	mA
T_{HYS}	Hysteresis Per Channel (default)	± 1.5	--	--	$^{\circ}C$
T_{SET}	Temperature Set-point	-36	--	55	$^{\circ}C$
T_{SET}	Temperature Set-point Accuracy ²	--	1	--	$^{\circ}C$
P_{HEAT}	Heater Load Power Dissipation Per Channel	--	--	20	W

¹ $V_{CC} = 24-38V$, $T_{AMB} = 25^{\circ}C$, All channels unless otherwise noted.

² Determined experimentally with Honeywell RTD

Characteristics may be customized for customer needs