

Description

The Thermal Test Vehicle, as “Thermal Twin” in a compact 60x60 mm² package is a highly versatile and precise temperature testing tool, designed to meet the demands of a wide range of temperature-related applications.

The TTV10 allows for the independent control of its four main heater zones and six hotspots, enabling users to simulate a wide range of thermal environments. The device's interface provides easy-to-use controls for customizing temperature profiles and setting up experiments.

The package comes with 16 temperature sensors inside the chip and 4 NTCs on the substrate backside that utilize a four-wire sensing to provide accurate and reliable temperature readings.

General Information

Chip type	NT20-3k-FC
Chip configuration	10 x 10 matrix
Chip size	24.9 x 24.9 x 0.5 mm ³
Assembly technology	Flip chip and underfill
Solder type	SAC305
Under bump metallization	NiAu (4 μm)
Solder bump diameter	300 μm
Bump raster	500 μm
PCB substrate	FR4 High TG
Chip material	Silicon, undoped
Chip surface finish	w/o BSM or NiV 300 nm Pt 100 nm Au 200 nm
Chip warpage	150 – 200 μm @RT
Substrate size	60 x 60 x 1.56 mm ³
Package size	60 x 60 x 2.24 mm ³

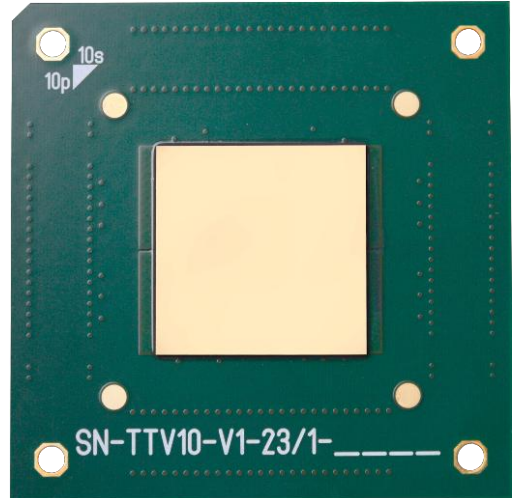
Heater (electrical specification)

Heater type	Resistor
Heater material	Ti 100 nm
Number of heater zone	4
Number of hotspots	6*
Electrical resistance per heater zone or hotspots	(7.0 ± 0.2) Ω
Max voltage per heater zone	60 V
Max current per heater zone	8.5 A
Max power per heater zone	500 W
Max theoretical package power	2000 W
Power density of heater zone hotspots	3.2 W/mm ² 10 W/mm ²
Max operating temperature	125 °C

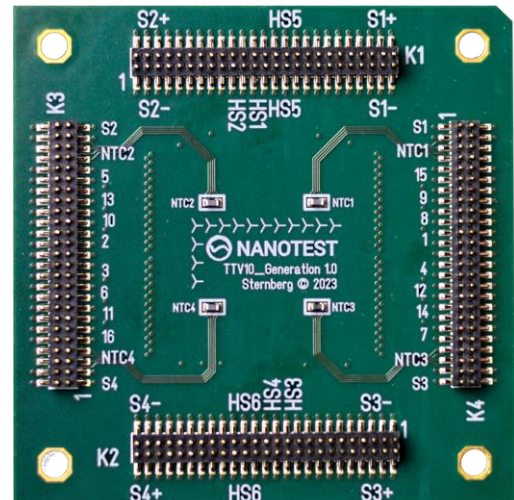
Sensor

Sensor type	Meander-structured RTD
Sensor material	Ti 100 nm
Number of sensors	16
Sensor position	See Figure 3
Resistance value at RT	(3.3 ± 0.1) kΩ
Sensitivity	10.0 Ω/K
Sensor connection	4-wire sensing
Dimensions (l × w)	820 × 100 μm ²

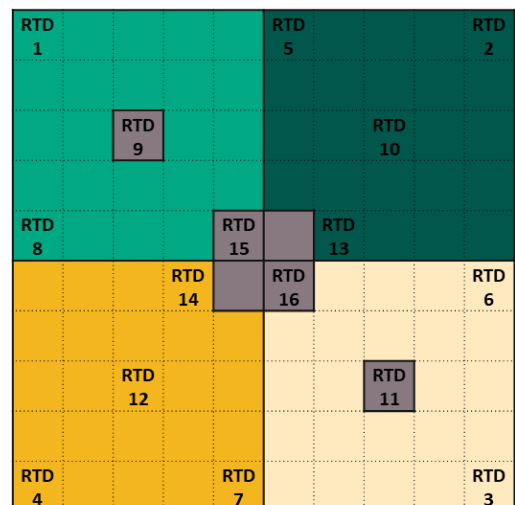
* Approximately 20% of the power is parasitically consumed by the adjacent primary heater, no absolute power measurement possible.



TTV10 package front side



TTV10 package back side



Heater zones, hotspots (grey) and RTD positions

