IP Data Sheet

Junction Over-Temperature Detector with Linear Centigrade-to-Voltage Output

The TS_TEMP_DET_X8 is a hysteresis detector that asserts output OVERTJ once junction temperature exceeds 147.2°C and subsequently stays above 138.2°C. Its thermometer provides a voltage on output CENTIGRADE that varies from about 100mV at 10°C with a typical slope of +8.99mV/°C up to 150°C.

The detector and its thermometer operate with one supply voltage V5V, ranging from 3.2V up to 5.5V, with one precision reference voltage VBG (1.247V) and two bias current sinks I10UA<1:0> at 9.5µA typically each.

OVERTJ logic-H voltage level is defined by V5V. Both OVERTJ and CENTIGRADE accept MOSFET gate capacitor load only, such as CMOS buffer input respectively PMOS differential-pair input. For applications with direct access to package input and output pins, some ESD protection must be inserted in the form of resistor/snapback-MOSFET pi-networks.

The minimum continuous operation lifetime spans 100000 hours.

Technology: X-FAB XT018-0.18µm BCD-on-SOI CMOS

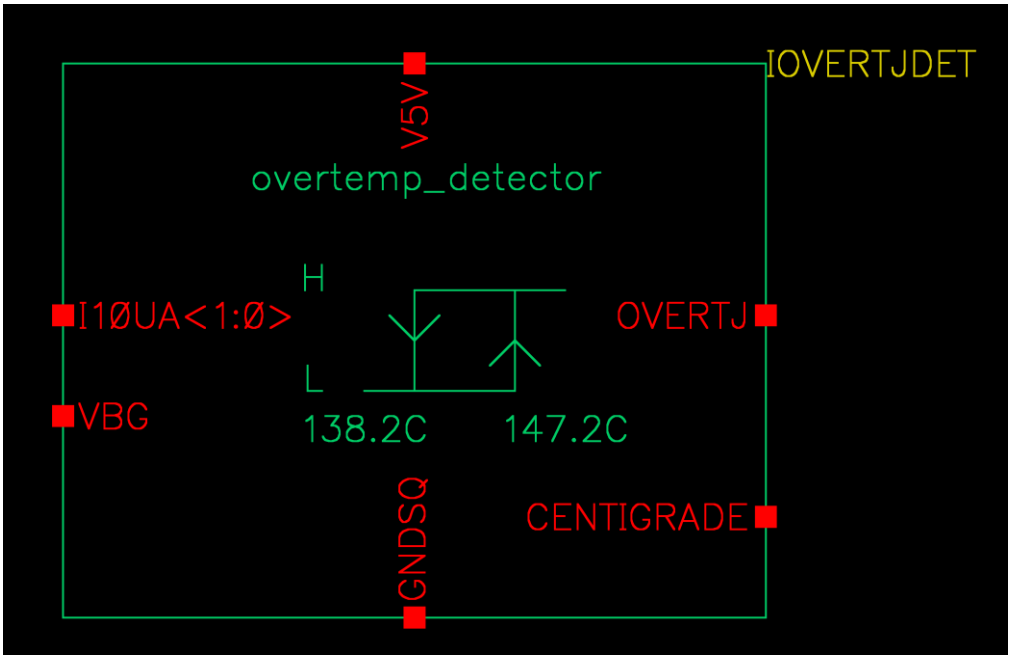

Fig. 1: Over-temperature Detector Symbol

OPERATING CONDITIONS

Parameters	Values / Type
Junction temperature range	-40ºC up to +150ºC
Supply voltage with respect to ground GNDSQ	V5V: 3.2V up to 5.5V
Reference voltage at 27°C junction temperature	VBG: 1.247V (±8.5mV)
Reference voltage maximum deviation up to 150°C	ΔVBG: -1.2mV (±3.5mV)
PTAT reference sink current intensity at 27°C junction temperature	I(I10UA): 9.5µA (+0.6µA) (-1.3µA)
OVERTJ and CENTIGRADE output loads	CMOS respectively PMOS gate

Table 1: Over-temperature Detector Operating Conditions

SPECIFICATION

Parameters	Values
OVERTJ logic-H voltage	V5V voltage
Detector low-going temperature threshold (OVERTJ toggles to logic-L as junction temperature falls)	138.2°C ± 5.3°C (± 3 sigma)
Detector hysteresis (high-going low-going temperature threshold difference)	9°C ± 1.5°C (± 3 sigma)
CENTIGRADE output voltage at 10°C junction temperature	99.5mV typical
CENTIGRADE output voltage slope up to 150°C	+8.99mV/°C typical
Operating power consumption	3.1mW max
Area	0.028mm²

Table 2: Over-temperature Detector Specifications

Sales & Marketing Contact

TES Electronic Solutions

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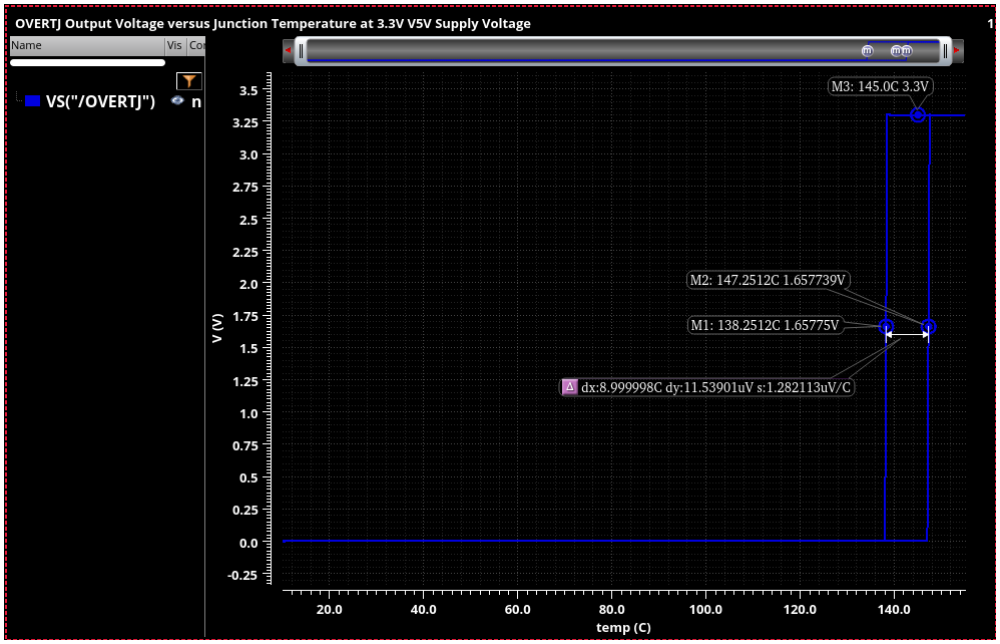
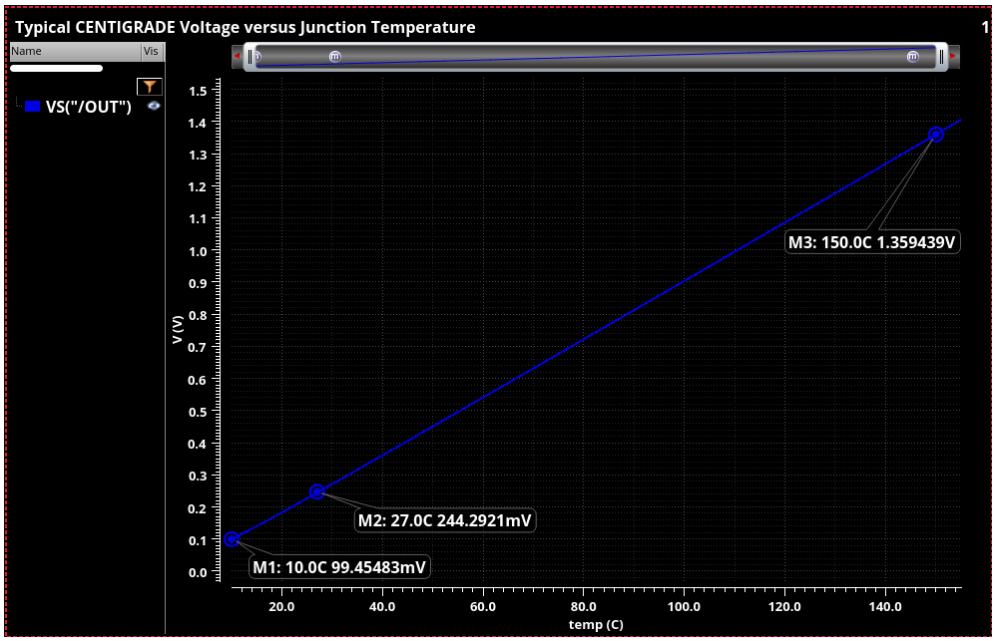
TYPICAL OVERTJ AND CENTIGRADE OUTPUT VOLTAGE RESPONSES TO JUNCTION TEMPERATURE





LAYOUT VIEW