



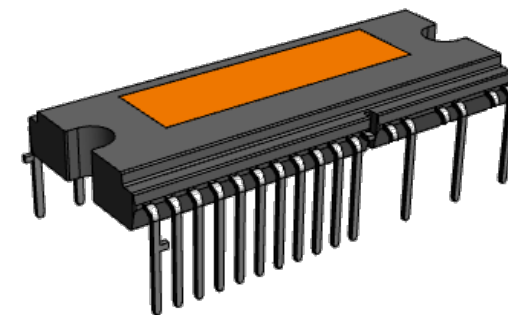
Working Together for a Greener Society

Future of Power Electronics and the Earth



High Voltage 3-phase Motor Drivers

SIM2 Series



■ Overview

The SIM2 series are high voltage 3-phase motor drivers in which transistors, pre-drive circuits, and bootstrap circuits (diodes and resistors) are highly integrated. These products can run on a 3-shunt current detection system and optimally control the inverter systems of medium-capacity motors that require universal input standards. The SIM2 series comes in a compact DIP40 package and will best suit compressor-driven applications such as air conditioners.

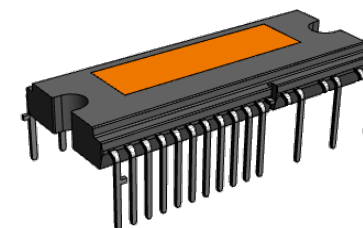
■ Application

For motor drive such as:

- Refrigerator Compressor Motor
- Air Conditioner Compressor Motor
- Washing Machine Main Motor
- Fan Motor
- Pump Motor

■ Package

DIP40



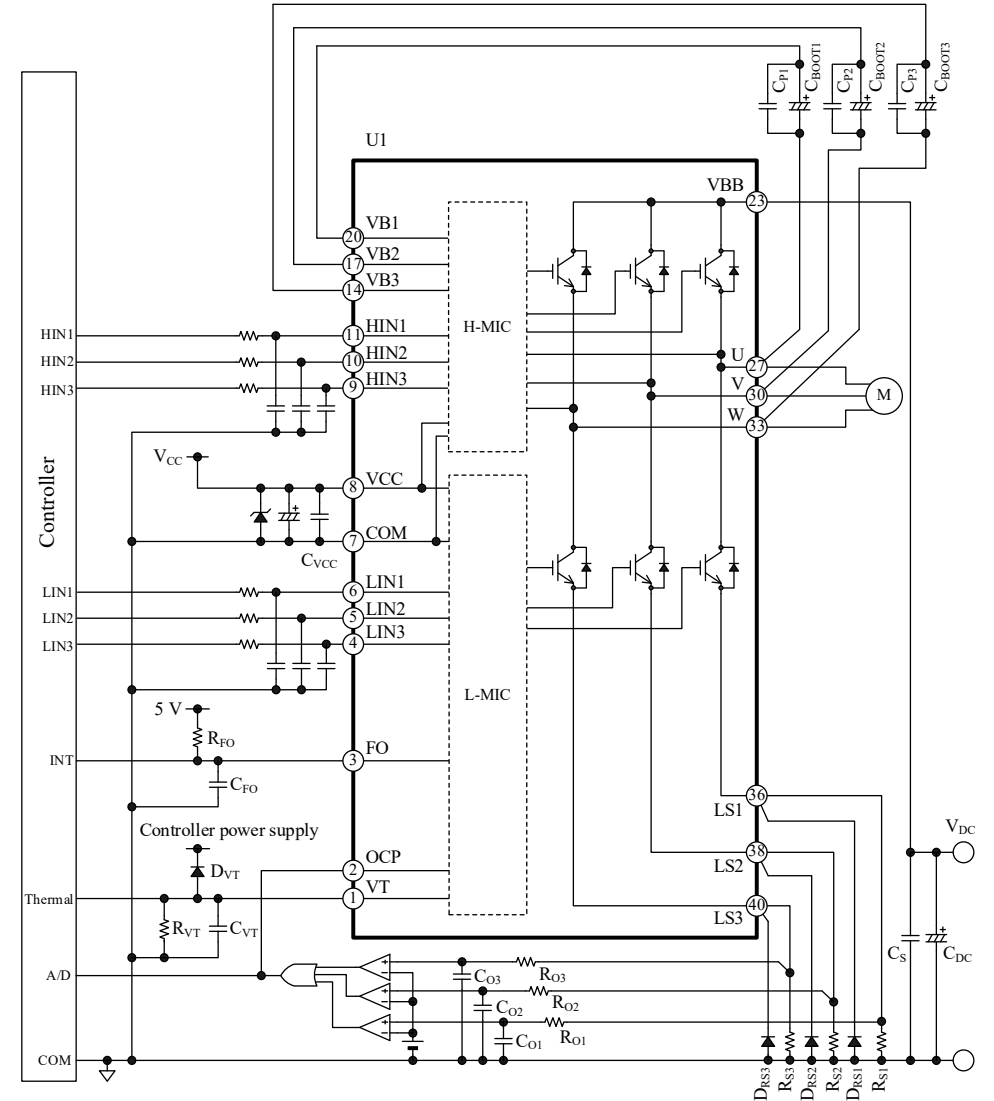
■ Selection Guide

Part Number	V_{CES}	I_C	Output Transistor	$V_{CE(SAT)}$ (Typ.)	Thermal Resistance
SIM2-151	600 V	15 A	FS-IGBT + FRD	1.6 V	3.2 °C/W
SIM2-151A		15 A		1.6 V	3.6 °C/W
SIM2-151AB		15 A		1.6 V	3.6 °C/W
SIM2-201		20 A		1.5 V	2.4 °C/W
SIM2-202B		20 A		1.7 V	3.0 °C/W

■ Features

- Sufficient insulation distance:
 - Clearance: 2.788 mm (min.)
 - Creepage: 4.334 mm (min.)
- Pb-free (RoHS compliant)
- Isolation voltage: 2000 V (for 1 min)
UL-recognized component (File No.: E118037)
- Temperature sensing function
- Built-in bootstrap diodes with current limiting resistors (250 Ω)
- CMOS-compatible input (3.3 V or 5 V)
- Fault signal output at protection activation
- Protections include:
 - Undervoltage Lockout for power supply
 - High-side (UVLO_VB): auto-restart
 - Low-side (UVLO_VCC): auto-restart
 - Overcurrent Protection (OCP): auto-restart
 - Thermal Shutdown (TSD): auto-restart, with an operating range of $\pm 5\text{ }^{\circ}\text{C}$

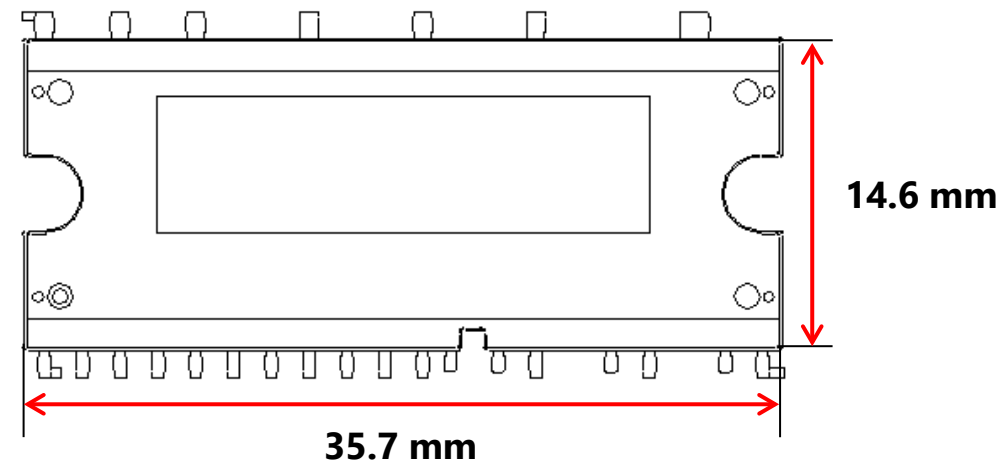
■ Typical Application



■ Ultra-compact Package: DIP40

The SIM2 series comes in an ultra-compact DIP40 package. This package adopts a direct bonding copper (DBC) structure to decrease its size (resin area) to 521 mm² (35.7 mm x 14.6 mm).

Compared to our conventional types, the SIM2 series stands out for its package size reduced by 40% or more.

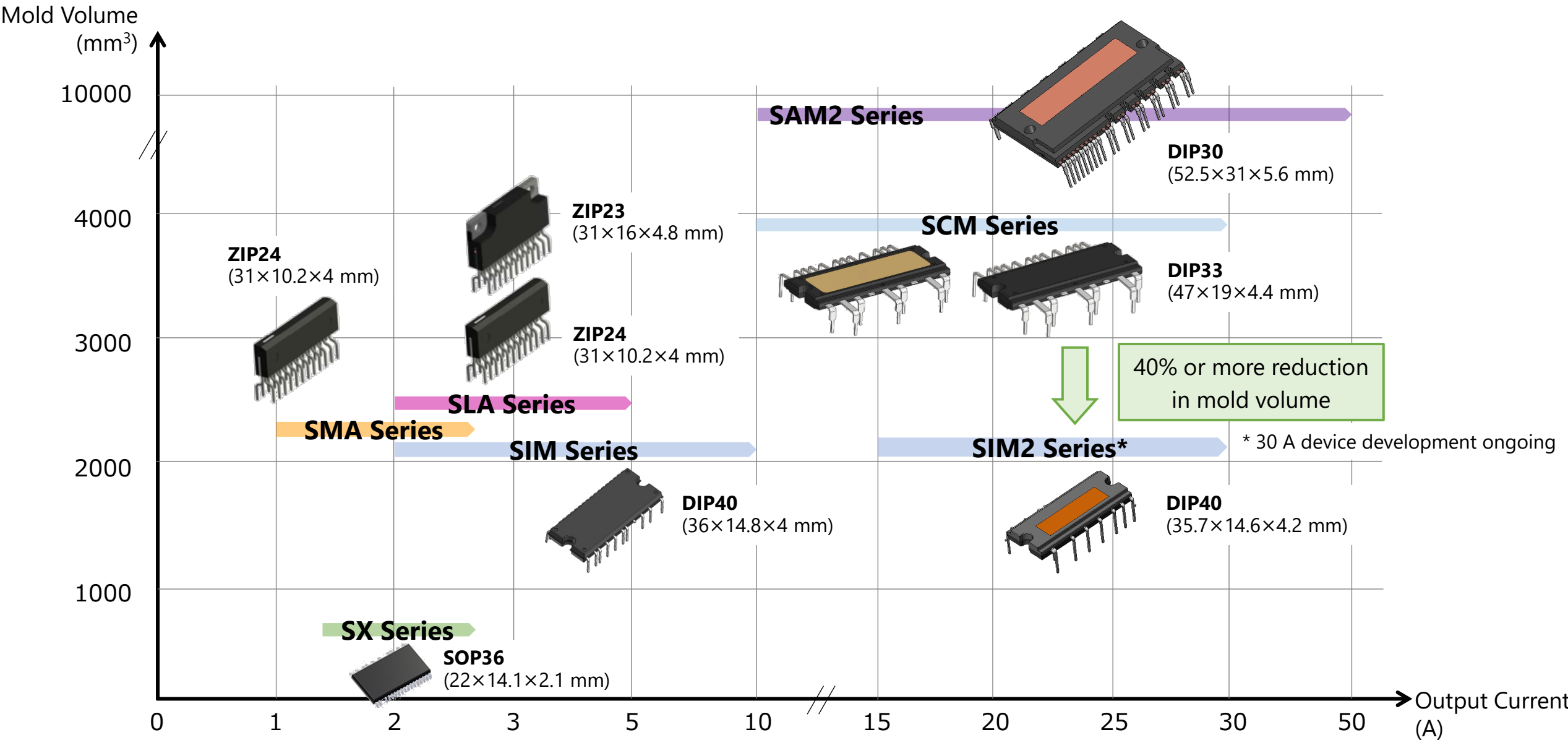


■ Enhanced Heat Dissipation

Owing to the direct bonding copper (DBC) structure, the SIM2 series is designed to fit into the compact package yet has a smaller thermal resistance. This allows the products to achieve higher heat dissipation performance.

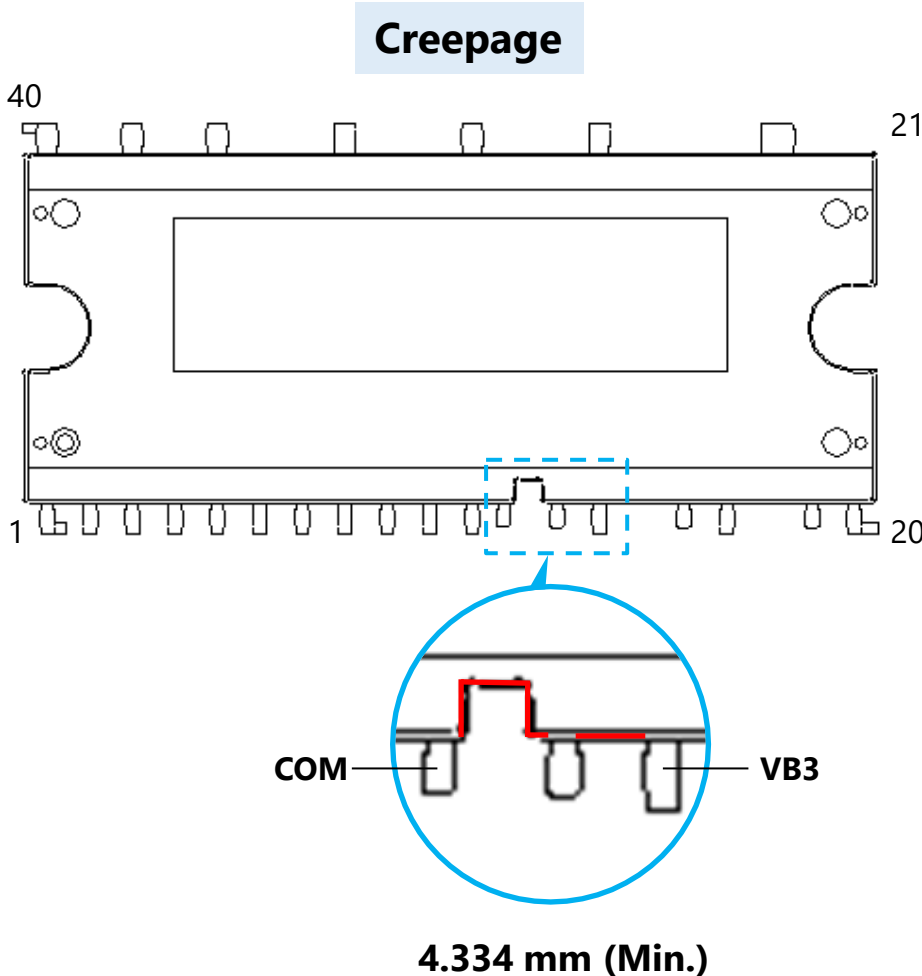
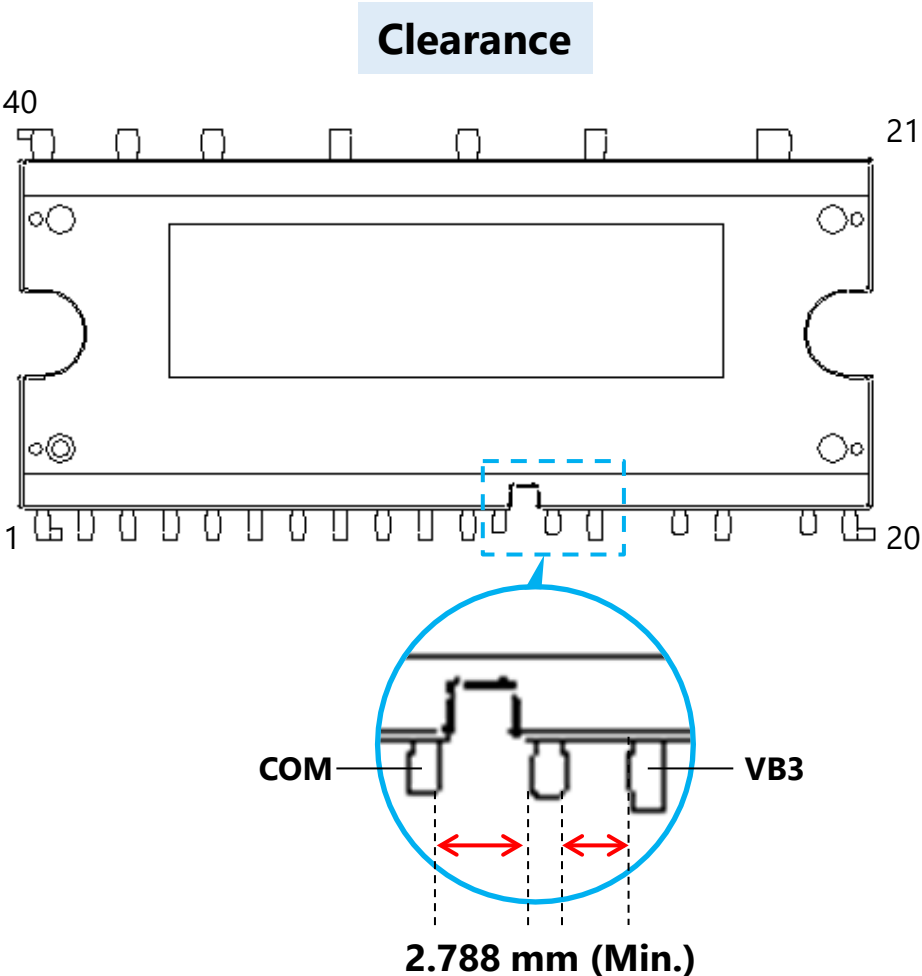
Part Number	I _C	Thermal Resistance
SIM2-151	15 A	3.2 °C/W
SIM2-151A	15 A	3.6 °C/W
SIM2-151AB	15 A	3.6 °C/W
SIM2-201	20 A	2.4 °C/W
SIM2-202B	20 A	3.0 °C/W

Package Guideline for High Voltage Motor Drivers



■ Ensured Clearance/Creepage

The SIM2 series ensures sufficient insulation distance: a clearance of 2.788 mm (min.) between the high-voltage pins (COM – VB3), and a creepage of 4.334 mm (min.).



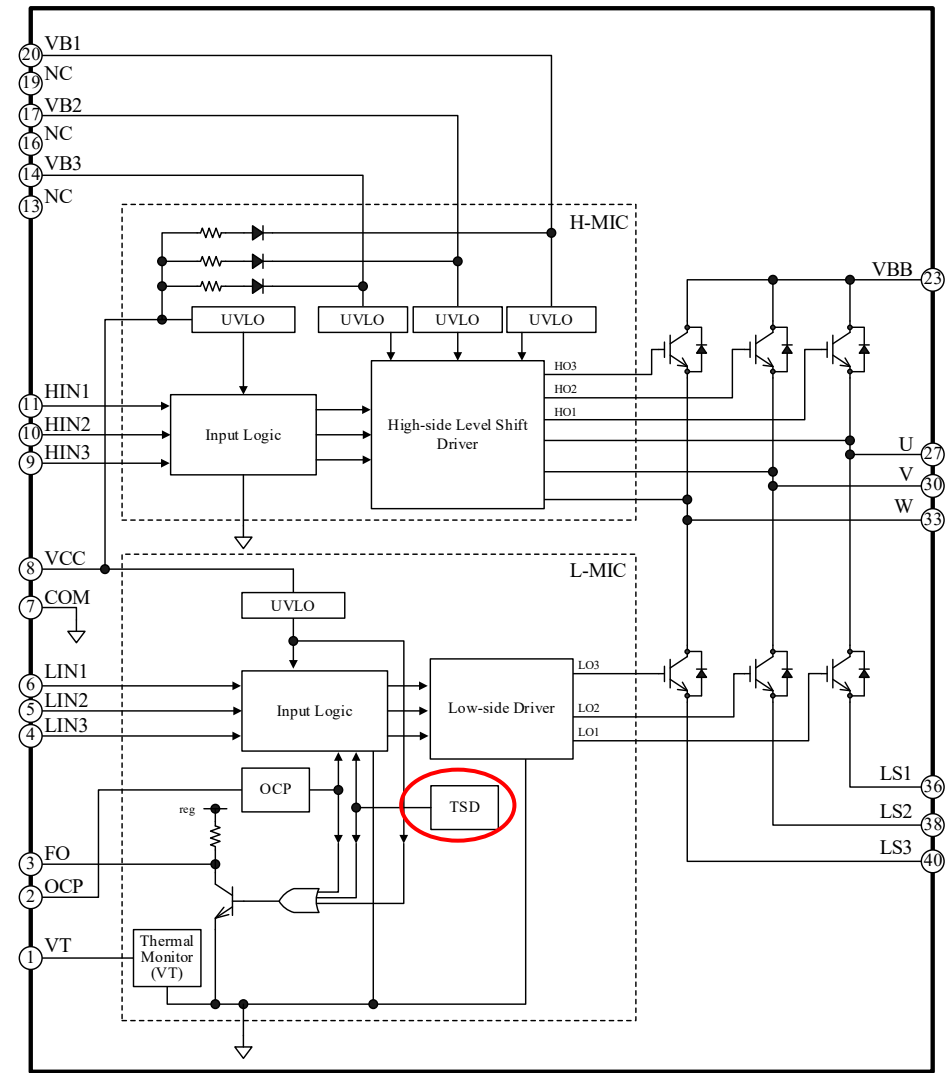
■ Thermal Shutdown (TSD)

The SIM2 series has the thermal shutdown (TSD) function.

This function starts to operate when the internal control part exceeds the TSD operating temperature, $T_{DH} = 120\text{ }^{\circ}\text{C}$ (typ.).

In addition, the TSD function is precisely designed so that the operating temperature varies within $\pm 5\text{ }^{\circ}\text{C}$ of its typical value.

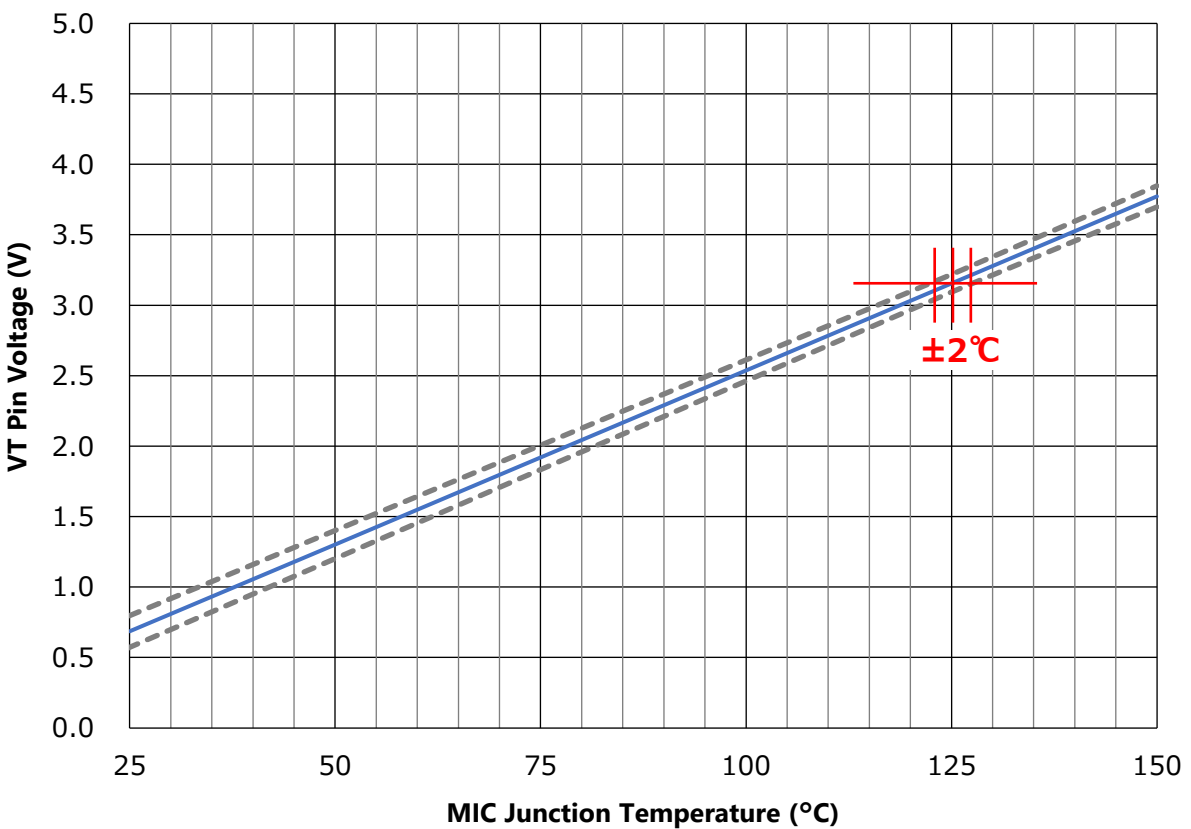
SIM2-201/SIM2-202B Block Diagram



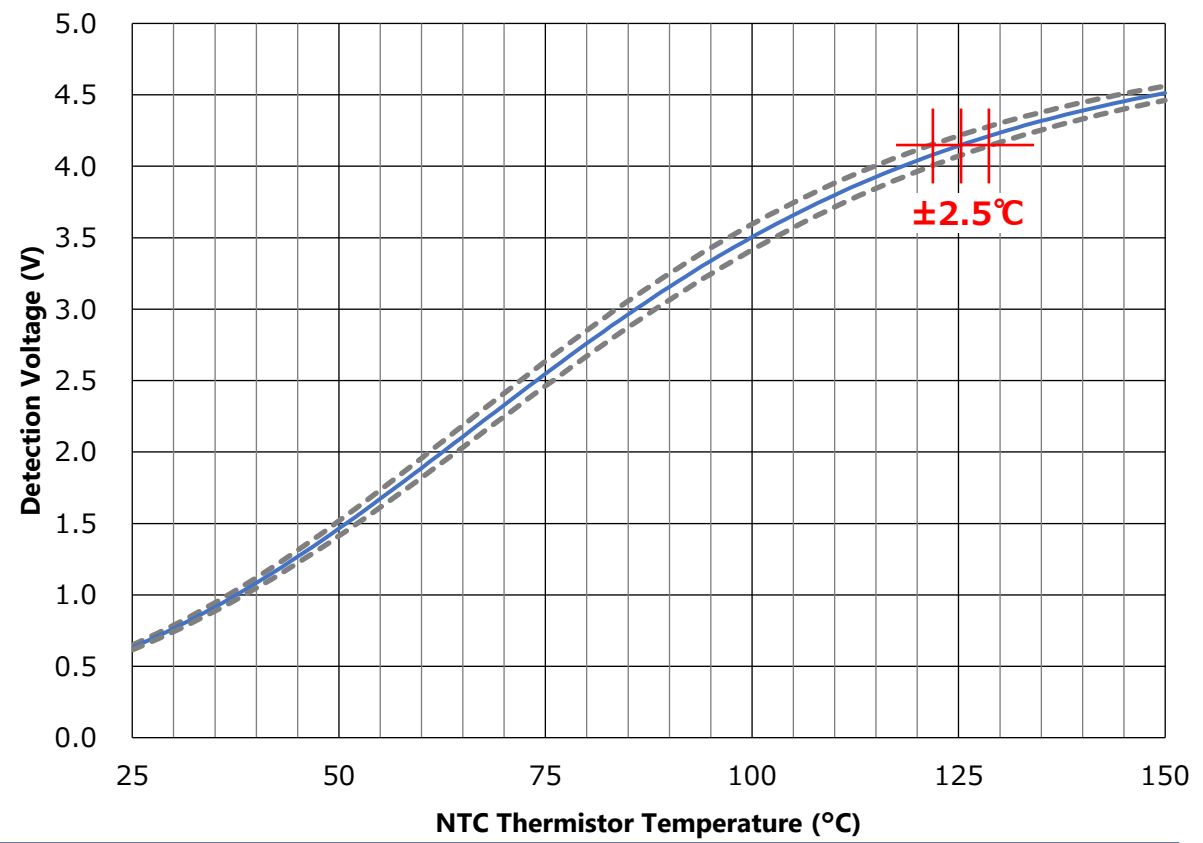
■ Precise Temperature Monitor

The SIM2 series incorporates the temperature sensing function. This function monitors the junction temperature of the internal control IC using a temperature-sensing voltage that the VT pin outputs. With a variation of $\pm 1.6\%$ in junction temperature over temperature sensing voltage, the SIM2 series boasts its preciseness equivalent to that of thermistor-mounted devices.

SIM2 Series (Temp. Sensing Function)



Temp. Monitor Example with NTC Thermistor



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