

TEMPERATURE SENSOR IC

FEATURES

- Linear Output Voltage 10 mV/°C Output
- Active High On/Off Control
- 4.5 to 10.0 V Supply Range
- Miniature Package (SOT-25)
- Minimum External Parts Count
- Low Power Consumption

DESCRIPTION

The TK11031 is a temperature sensor IC with a linear output of 10 mV/°C over the range of -30 to +105 °C. Its wide operating voltage range of 4.5 to 10.0 V makes it suitable for a number of applications requiring accurate temperature control, such as electronic thermostats for climate control, refrigerators, and industrial process controls. The device is in the "on" state when the control pin is pulled to a logic high level.

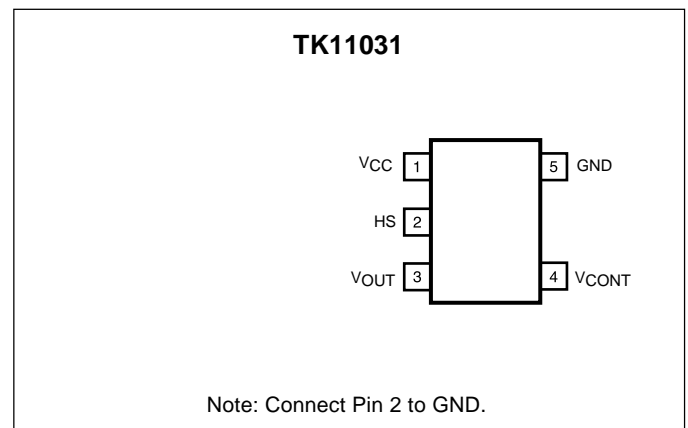
A typical application is to make a digital representation of temperature with an A/D converter, or to make a thermal detector with a comparator.

The TK11031 has a compensation pin for a 0.1 μF capacitor that ensures stability over the IC's operating temperature range.

The TK11031 is available in a miniature SOT-25 surface mount package.

APPLICATIONS

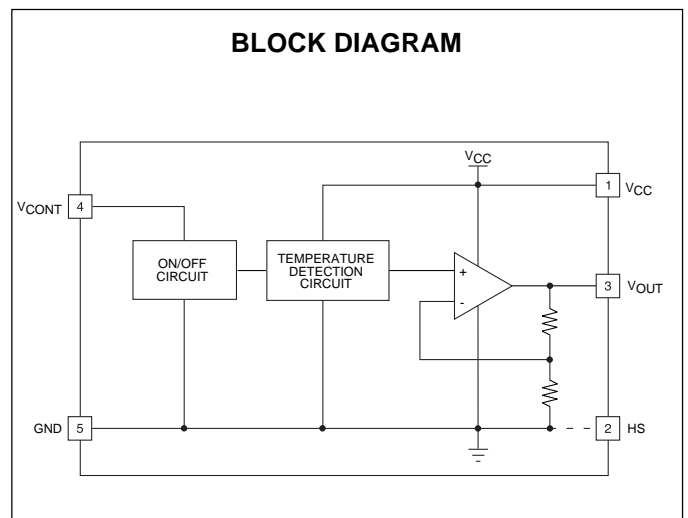
- Home and Industrial Thermostats
- Automotive Climate Control
- Battery Charger Temperature Monitor
- Notebook Computer Temperature Monitor
- Electronic Thermometers
- Fish Finder Water Temperature
- Industrial Process Controllers
- Home Appliance Temperature Control



ORDERING INFORMATION

TK11031M Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left



TK11031

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	12 V	Storage Temperature Range	-55 to +150 °C
Operating Voltage	4.5 to 10 V	Operating Temperature Range	-30 to +105 °C
Power Dissipation (Note 1)	150 mW	Lead Soldering Temperature (10 s)	235 °C
Junction Temperature	150 °C		

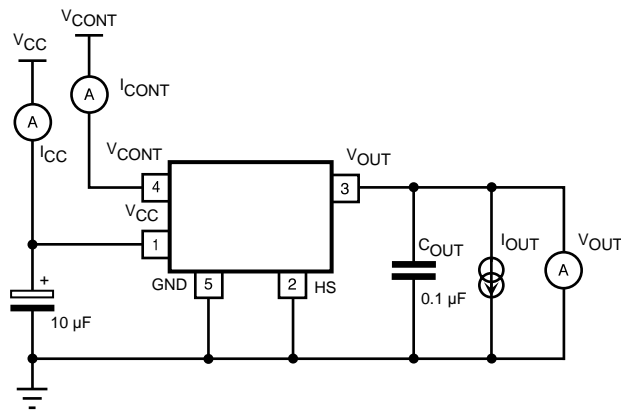
TK11031 ELECTRICAL CHARACTERISTICS

Test Conditions: $V_{CC} = 5.0\text{ V}$, $V_{CONT} = 2.4\text{ V}$, $I_{OUT} = 0\text{ }\mu\text{A}$, $T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
V_{OUT}	Output Voltage	$T_A = 25\text{ }^\circ\text{C}$	2.952	2.982	3.012	V
		$T_A = 85\text{ }^\circ\text{C}$	3.551	3.591	3.631	V
		$T_A = -30\text{ }^\circ\text{C}$		2.435		V
T_C	Temperature Coefficient	$T_A = 25\text{ }^\circ\text{C}$ to $85\text{ }^\circ\text{C}$	9.35	10.15	10.95	mV/°C
Line Reg	Line Regulation	$V_{CC} = 5$ to 10 V	-20	5	20	mV
Load Reg	Load Regulation	$I_{OUT} = 0$ to $400\text{ }\mu\text{A}$		3	20	mV
I_{CC}	Supply Current			90	150	μA
I_{OUT}	Output Current	$\Delta V_{OUT} \leq 20\text{ mV}$			400	μA
$I_{CC(STBY)}$	Standby Supply Current	$V_{CONT} \leq 0.6\text{ V}$			1	μA
CONTROL TERMINAL SPECIFICATIONS						
$V_{CONT(ON)}$	Control Voltage (ON)	$V_{OUT} = 2.952$ to 3.012 V , Output ON	1.8	2.4	V_{CC}	V
$V_{CONT(OFF)}$	Control Voltage (OFF)	$V_{OUT} \leq 0.1\text{ V}$, Output OFF	GND		0.6	V
I_{CONT}	Control Current			4.5	7.5	μA

Note 1: Power dissipation is 150 mW when mounted as recommended. Derate at 1.2 mW/°C for operation above 25 °C.

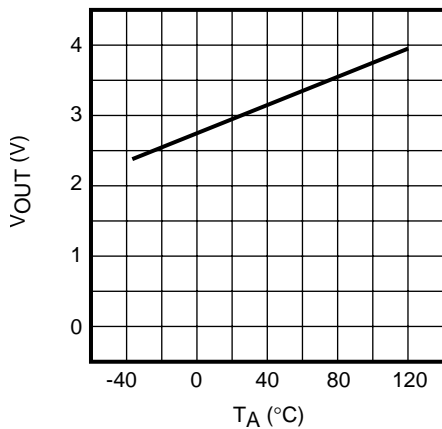
TEST CIRCUIT



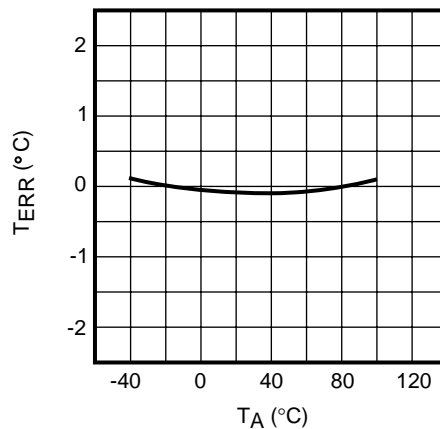
TYPICAL PERFORMANCE CHARACTERISTICS

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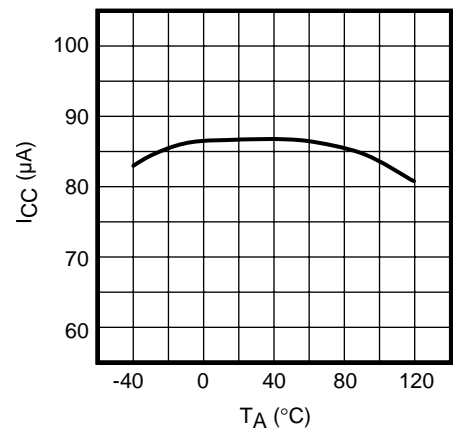
OUTPUT VOLTAGE vs. TEMPERATURE



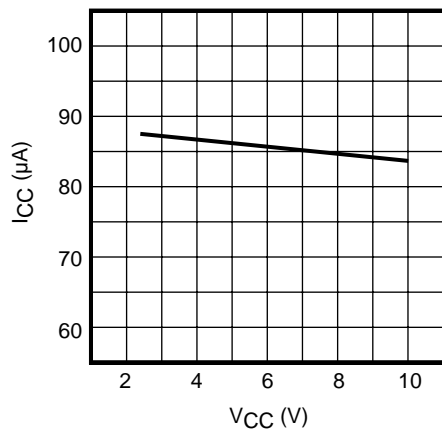
LINEARITY ERROR vs. TEMPERATURE



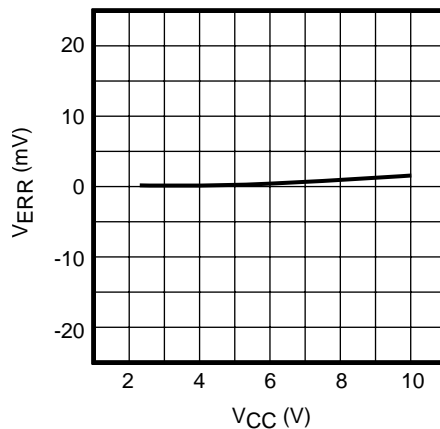
INPUT CURRENT vs. TEMPERATURE



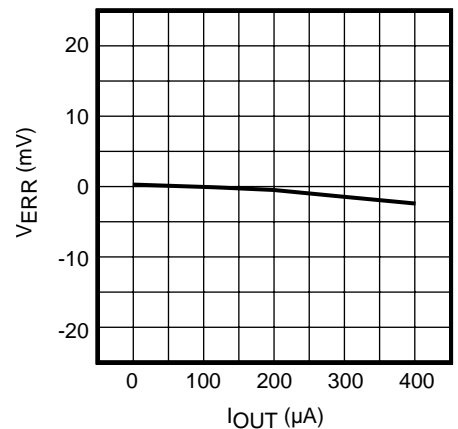
INPUT CURRENT vs. INPUT VOLTAGE



LINE REGULATION

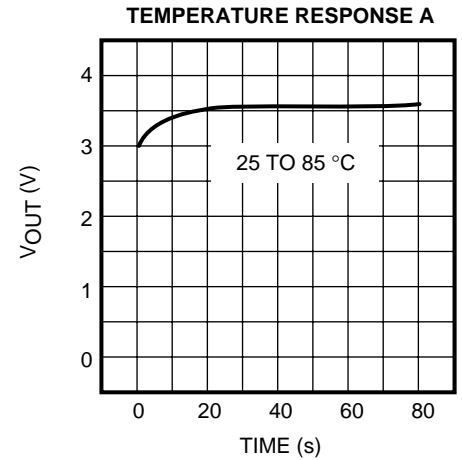
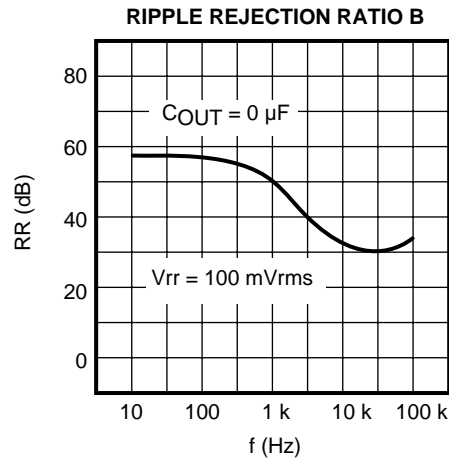
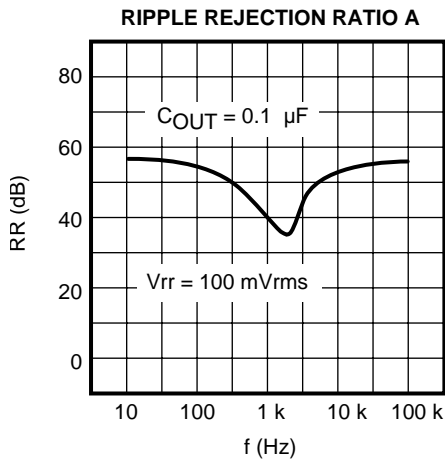
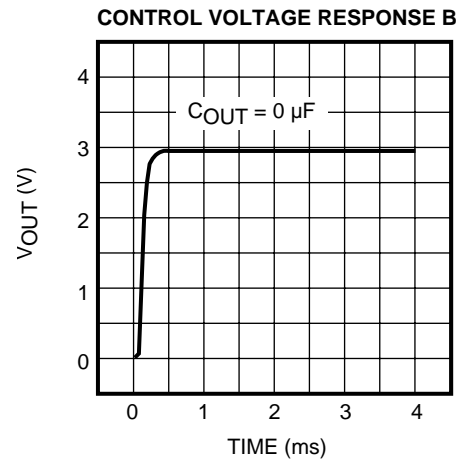
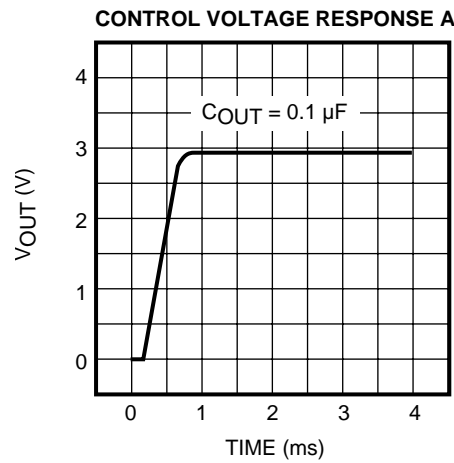
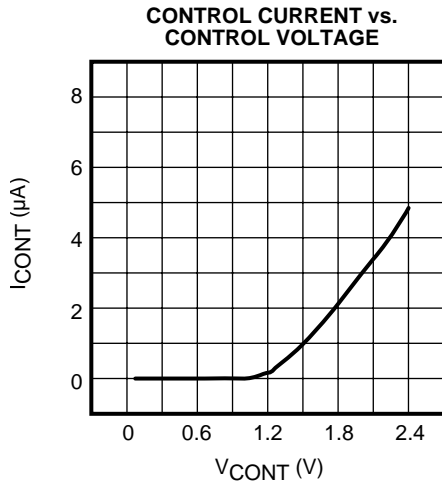
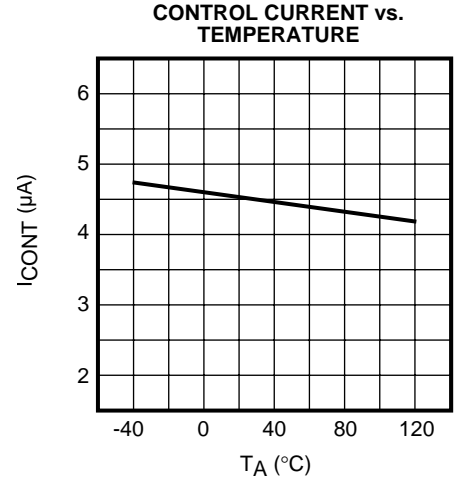
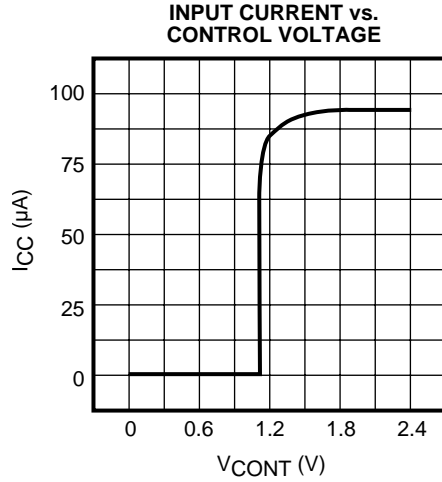
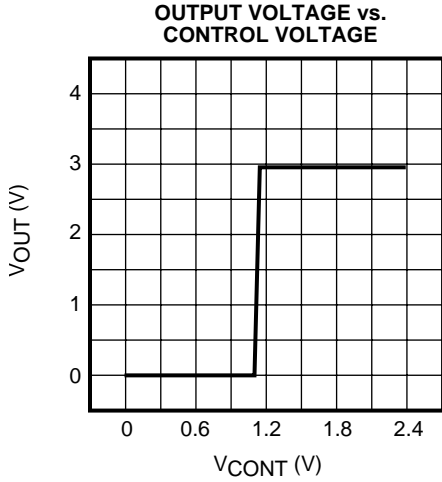


LOAD REGULATION



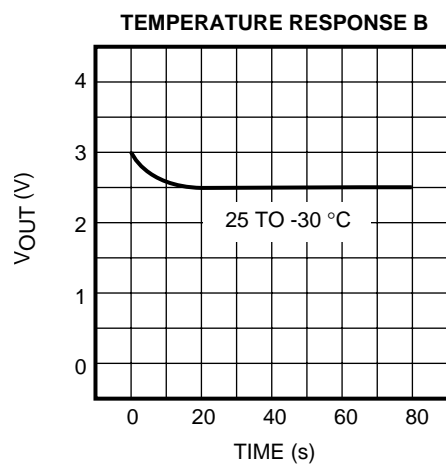
TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

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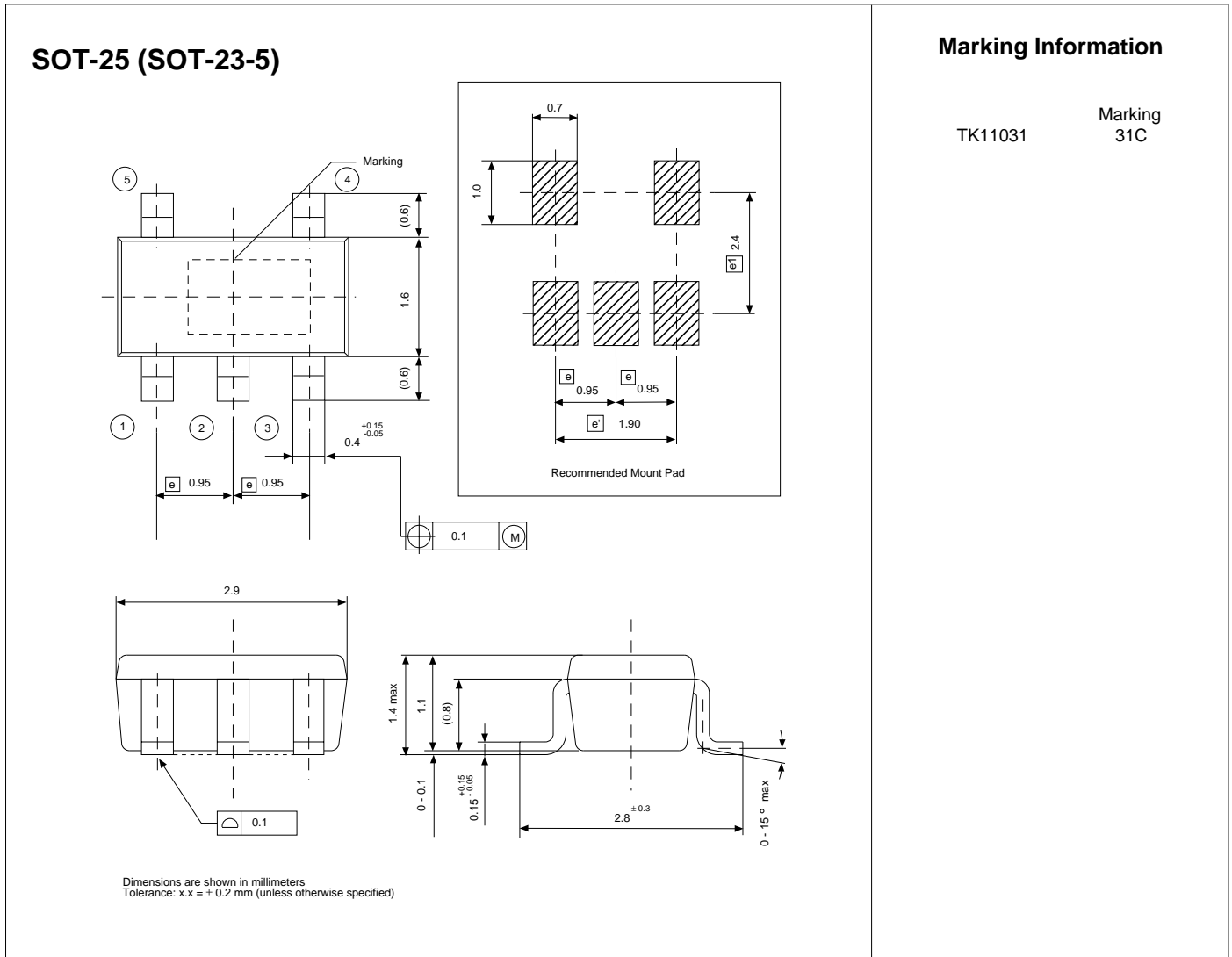


TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

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PACKAGE OUTLINE



Marking Information

TK11031

Marking
31C



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