

## TEMPERATURE SENSOR IC

### FEATURES

- Linear Output Voltage 6 mV/°C Output
- 2.7 to 10.0 V Supply Range
- Miniature Package (SOT-25)
- Minimum External Parts Count
- Low Power Consumption

### DESCRIPTION

The TK11042 is a temperature sensor IC with a linear output of 6 mV/°C over the range of -30 to + 105 °C. Its wide operating voltage range of 2.7 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.

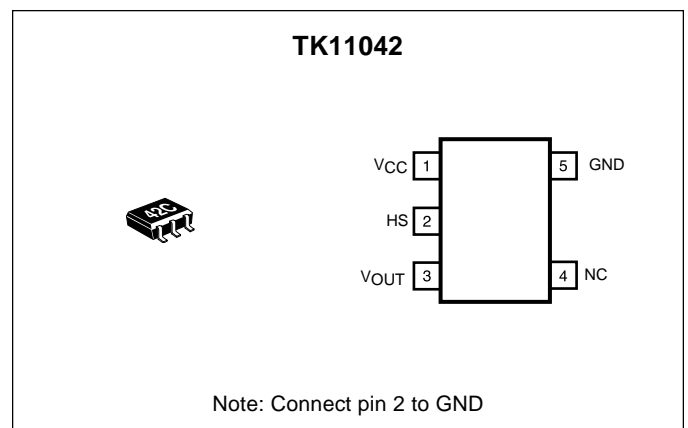
A typical application is to make a digital representation of temperature with an A/D converter, or to make a thermal detector with a comparator.

The TK11042 has a compensation pin for a 0.1 μF capacitor that ensures stability over the IC's operating temperature range.

The TK11042 is available in a miniature SOT-25 surface mount package.

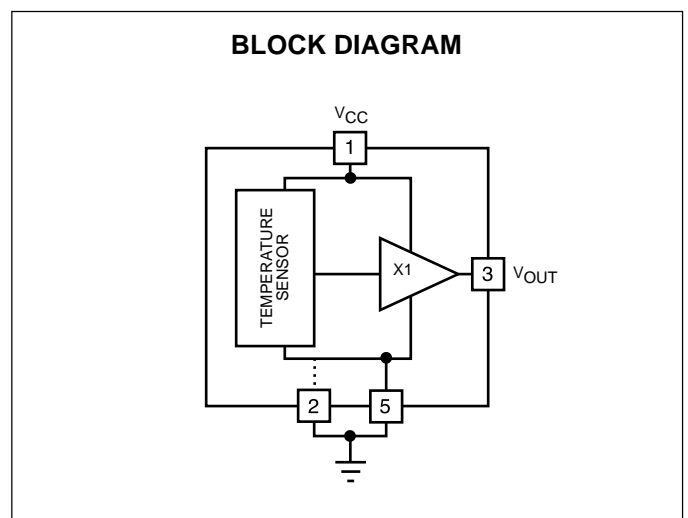
### APPLICATIONS

- 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	
TK11042M-1	 Tape/Reel Code

TAPE/REEL CODE  
TL: Tape Left



# TK11042

## ABSOLUTE MAXIMUM RATINGS

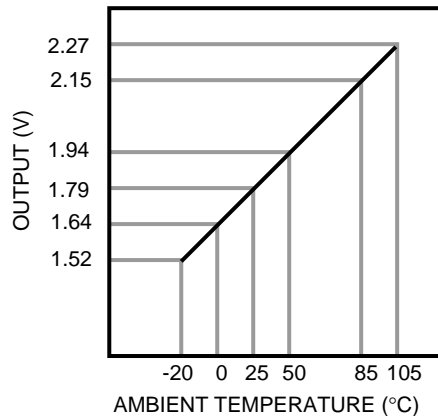
Supply Voltage .....	12 V	Storage Temperature Range .....	-55 to +150 °C
Operating Voltage .....	2.7 to 10 V	Operating Temperature Range .....	-30 to +105 °C
Power Dissipation (Note 1) .....	150 mW	Lead Soldering Temperature (10 s) .....	235 °C
Junction Temperature .....	150 °C		

## TK11042 ELECTRICAL CHARACTERISTICS

Test Conditions:  $V_{CC} = 3.0\text{ V}$ ,  $I_{OUT} = 0\text{ }\mu\text{A}$ ,  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

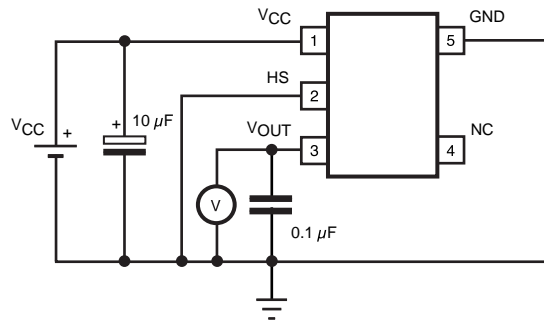
SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$V_{OUT}$	Output Voltage	$T_A = 25\text{ }^\circ\text{C}$	1.776	1.794	1.812	V
		$T_A = 85\text{ }^\circ\text{C}$	2.131	2.155	2.179	V
		$T_A = -30\text{ }^\circ\text{C}$		1.463		V
$T_C$	Temperature Coefficient	$T_A = 25\text{ }^\circ\text{C}$ to $85\text{ }^\circ\text{C}$	5.50	6.02	6.50	mV/°C
Line Reg	Line Regulation	$V_{CC} = 3$ to $10\text{ V}$	-12	2	12	mV
Load Reg	Load Regulation	$I_{OUT} = 0$ to $100\text{ }\mu\text{A}$	0	2	12	mV
$I_{CC}$	Supply Current	$T_A = 25\text{ }^\circ\text{C}$		110	180	$\mu\text{A}$
$I_{OUT}$	Output Current	$\Delta V_{OUT} \leq 15\text{ mV}$			400	$\mu\text{A}$

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



**FIGURE 1. OUTPUT CHARACTERISTICS**

**TEST CIRCUIT**

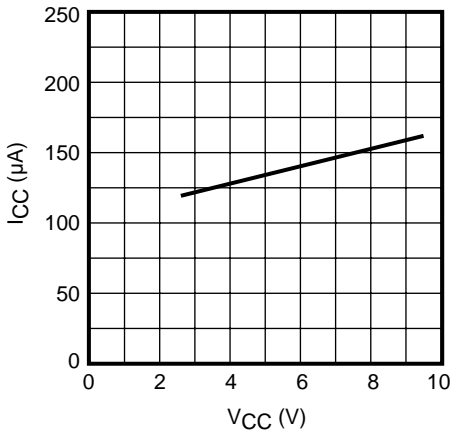


Note: Connect pin 2 to ground

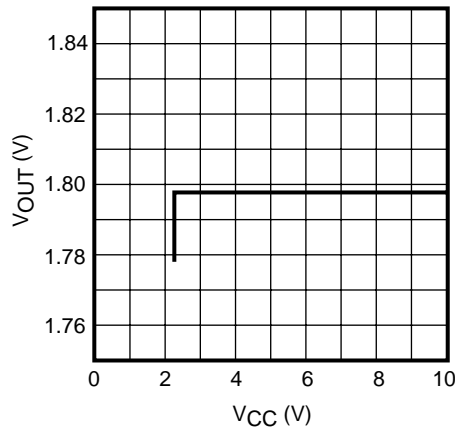
**TYPICAL PERFORMANCE CHARACTERISTICS**

$V_{CC} = 3\text{ V}$ ,  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

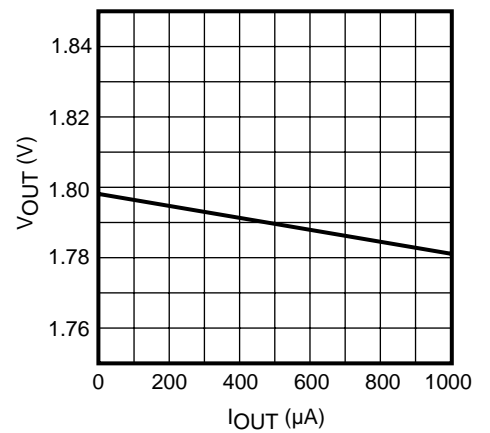
**SUPPLY CURRENT vs. SUPPLY VOLTAGE**



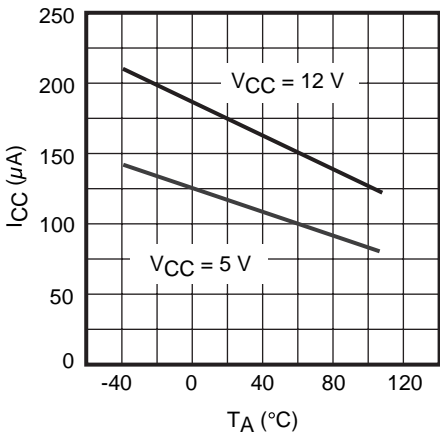
**OUTPUT VOLTAGE vs. SUPPLY VOLTAGE**



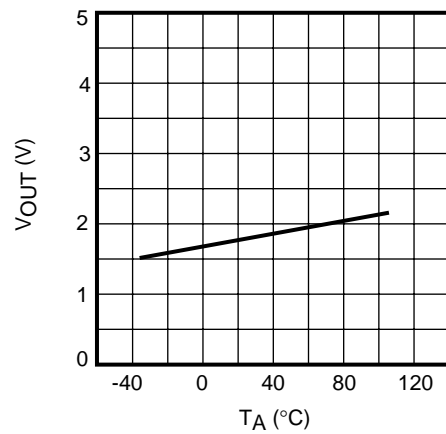
**OUTPUT VOLTAGE vs. OUTPUT CURRENT**



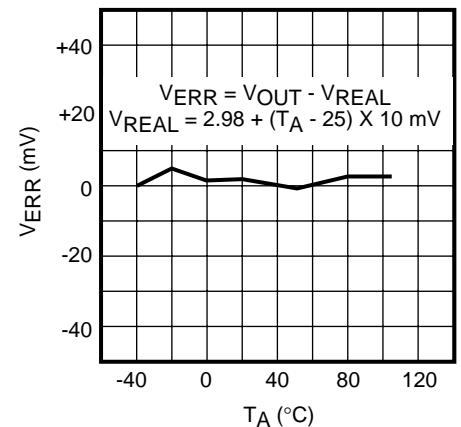
**SUPPLY CURRENT vs. TEMPERATURE**



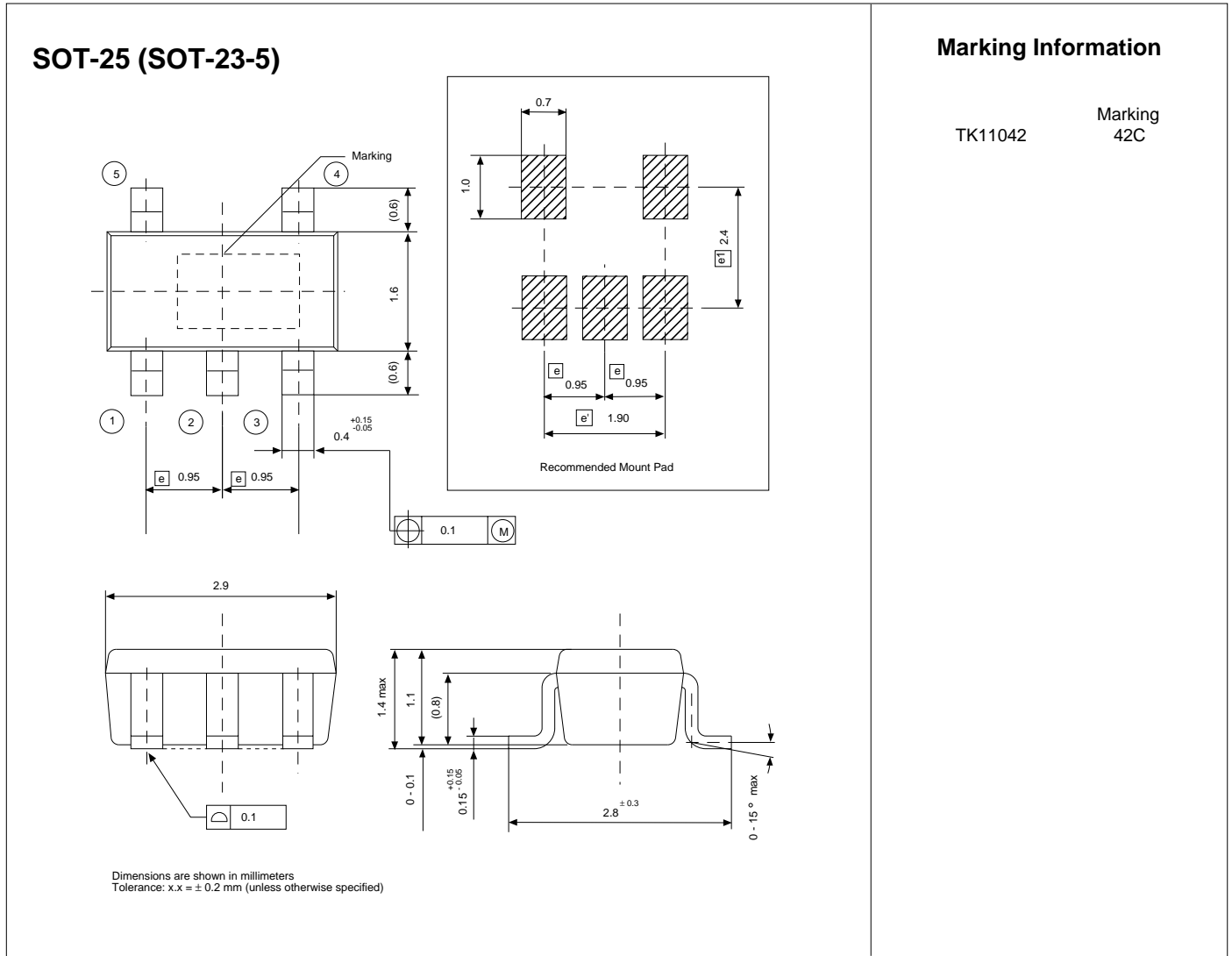
**OUTPUT VOLTAGE vs. TEMPERATURE**



**LINEARITY ERROR vs. TEMPERATURE**



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