TOKO

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**

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**

DESCRIPTION

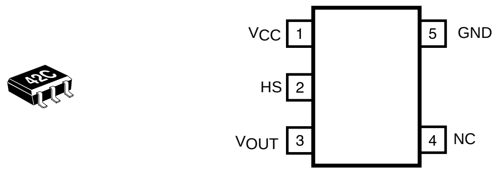
The TK11042 is a temperature sensor IC with a linear output of 6 mV/°C over the range of -30 to + 105 °C. Its wide operating voltage range of 2.7 to 10.0 V makes it suitable for a number of applications requiring accurate temperature control, such as electronic thermostats for climate control, refrigerators, 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.

TK11042

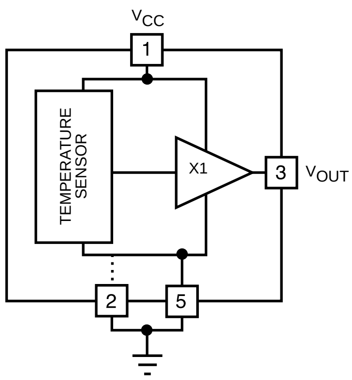


Note: Connect pin 2 to GND

ORDERING INFORMATION
TK11042M-1 ☐☐ — Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

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

TK11042 ELECTRICAL CHARACTERISTICS

Test Conditions: V_{CC} = 3.0 V, I_{OUT} = 0 µA, T_A = 25 °C, unless otherwise specified.

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

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

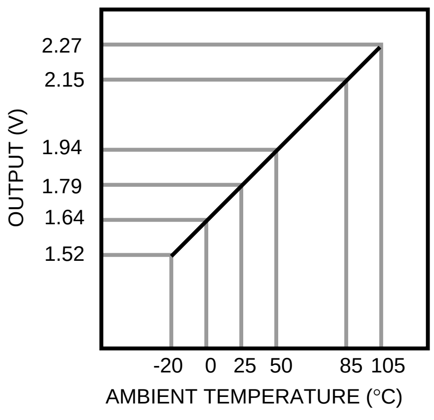
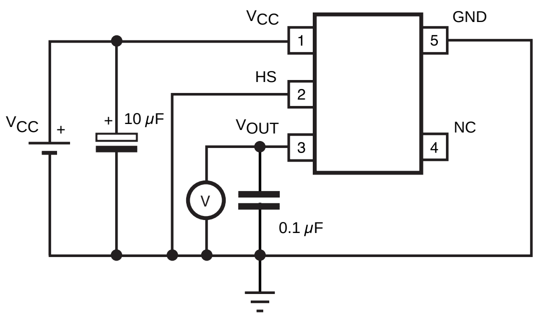


FIGURE 1. OUTPUT CHARACTERISTICS

TEST CIRCUIT

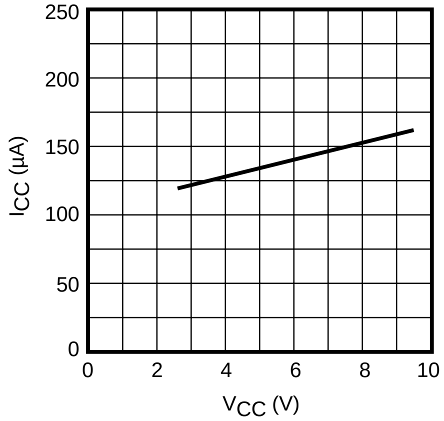


Note: Connect pin 2 to ground

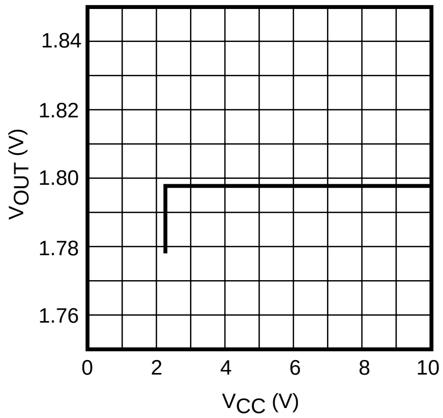
TYPICAL PERFORMANCE CHARACTERISTICS

V_{CC} = 3 V, T_A = 25 °C, unless otherwise specified.

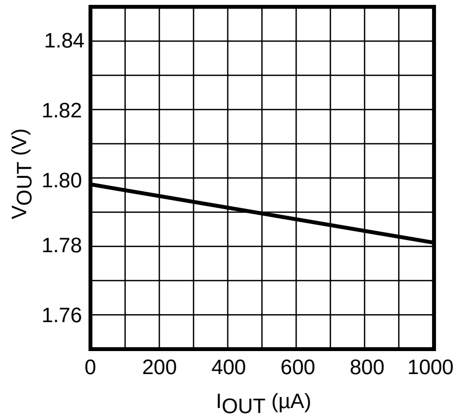
SUPPLY CURRENT vs. SUPPLY VOLTAGE



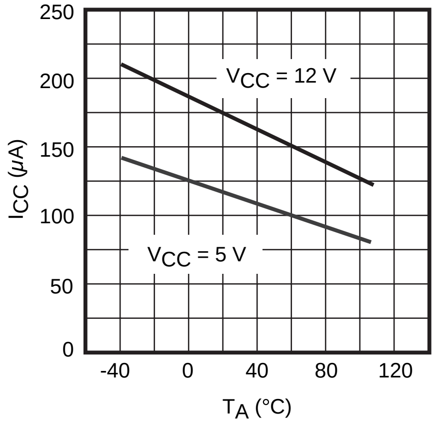
OUTPUT VOLTAGE vs. SUPPLY VOLTAGE



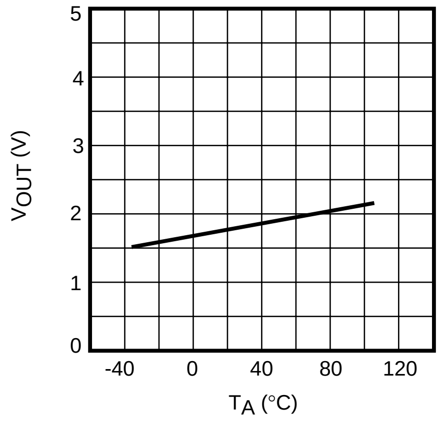
OUTPUT VOLTAGE vs. OUTPUT CURRENT



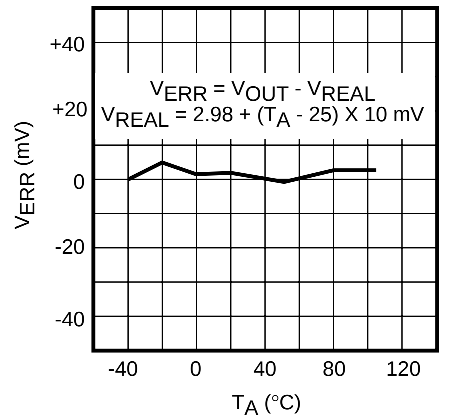
SUPPLY CURRENT vs. TEMPERATURE



OUTPUT VOLTAGE vs. TEMPERATURE

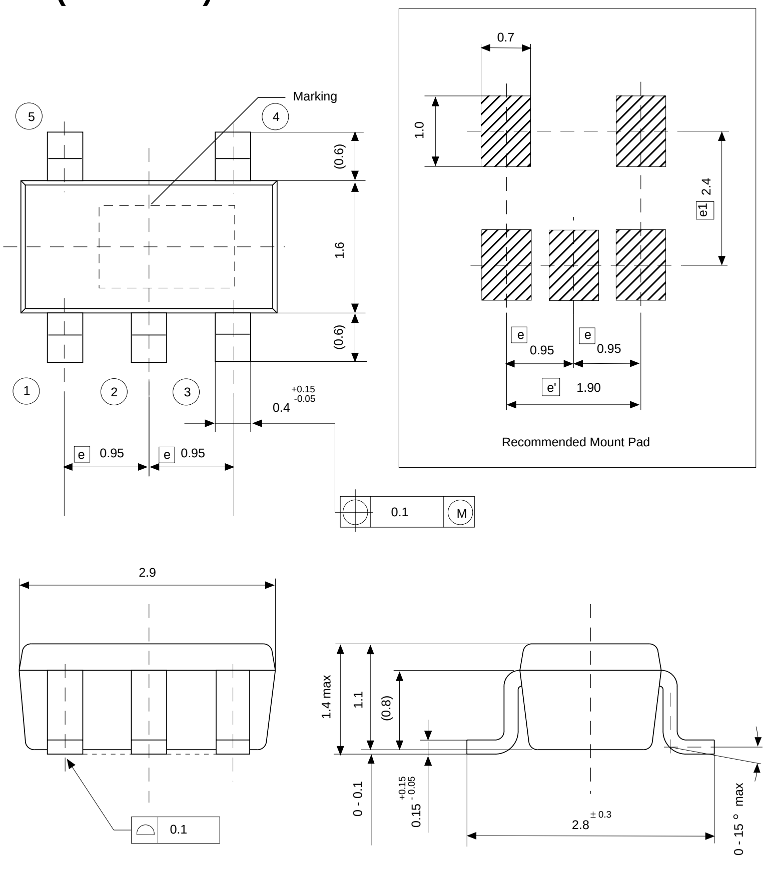


LINEARITY ERROR vs. TEMPERATURE



PACKAGE OUTLINE

SOT-25 (SOT-23-5)



Dimensions are shown in millimeters
Tolerance: x.x = ± 0.2 mm (unless otherwise specified)

Marking Information

	Marking
TK11042	42C

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