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

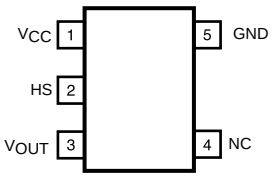
The TK11042 is a temperature sensor IC with a linear output of 6 mV/°C over the range of -30 to + 105 °C. Its wide operating voltage range of 2.7 to 10.0 V makes it suitable for a number of applications requiring accurate temperature control, such as electronic thermostats for climate control, refrigerators,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

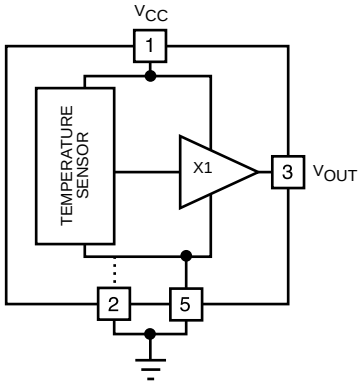
The TK11042 is available in a miniature SOT-25 surface mount package.

TK11042



Note: Connect pin 2 to GND

BLOCK DIAGRAM



ORDERING INFORMATION

TK11042M-1 □□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

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.

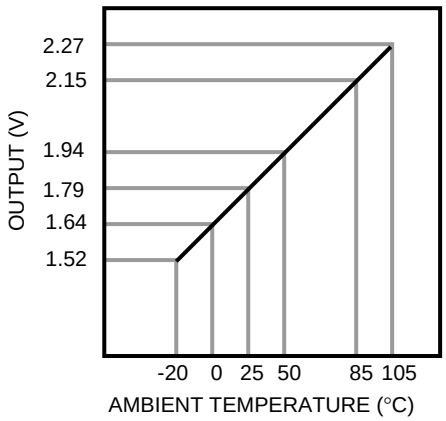
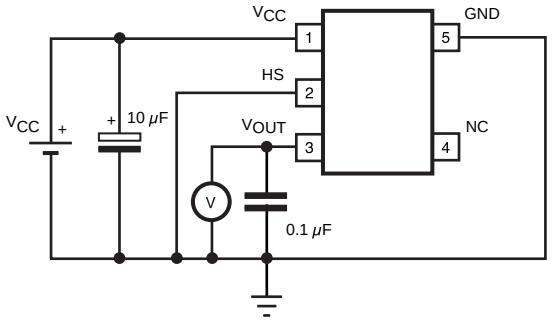


FIGURE 1. OUTPUT CHARACTERISTICS

TEST CIRCUIT

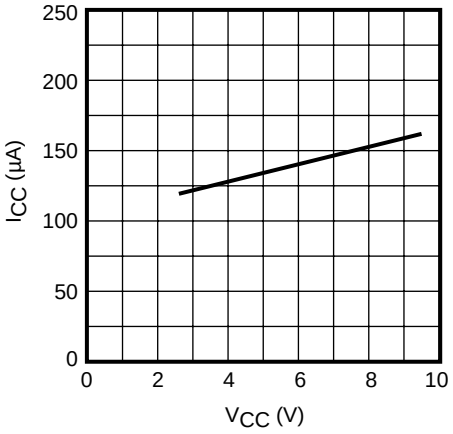


Note: Connect pin 2 to ground

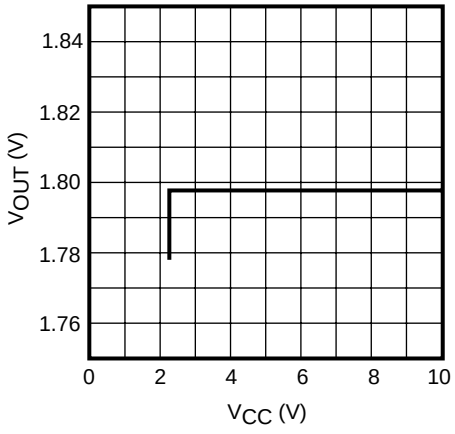
TYPICAL PERFORMANCE CHARACTERISTICS

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

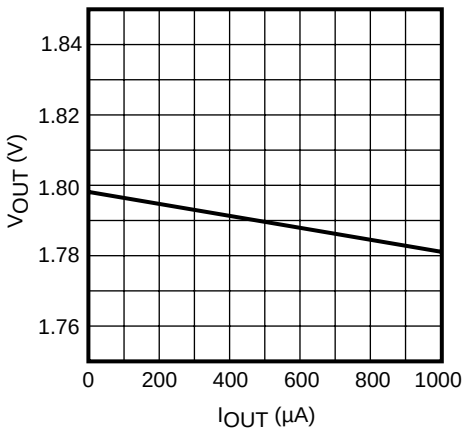
SUPPLY CURRENT vs. SUPPLY VOLTAGE



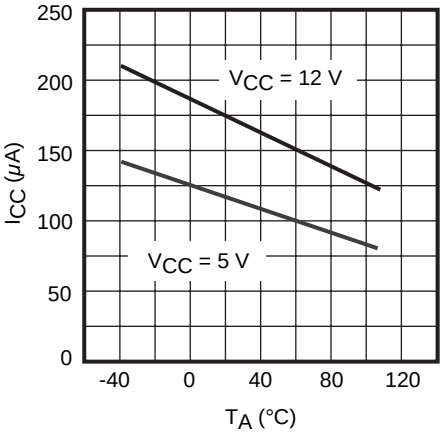
OUTPUT VOLTAGE vs. SUPPLY VOLTAGE



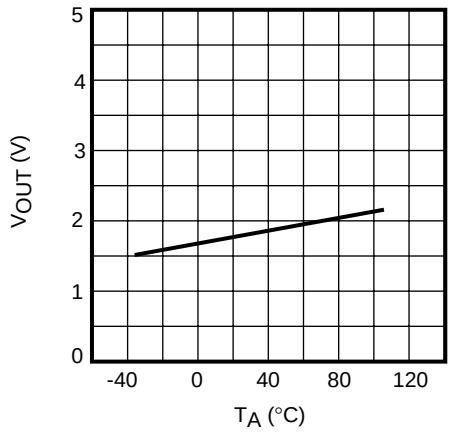
OUTPUT VOLTAGE vs. OUTPUT CURRENT



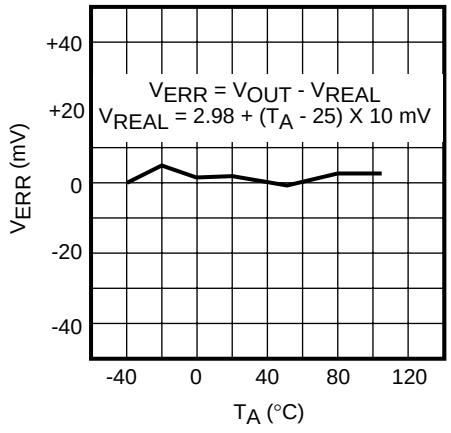
SUPPLY CURRENT vs. TEMPERATURE



OUTPUT VOLTAGE vs. TEMPERATURE

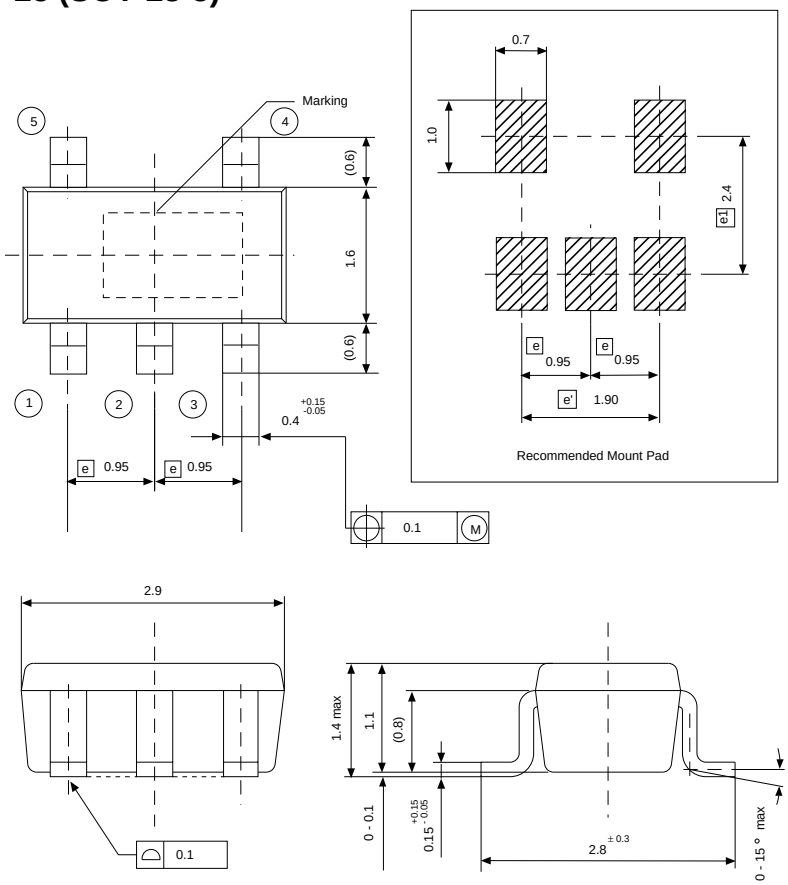


LINEARITY ERROR vs. TEMPERATURE



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

TOKO

Toko America, Inc. Headquarters
1250 Feehanville Drive, Mount Prospect, Illinois 60056
Tel: (847) 297-0070 Fax: (847) 699-7864

TOKO AMERICA REGIONAL OFFICES

Midwest Regional Office
Toko America, Inc.
1250 Feehanville Drive
Mount Prospect, IL 60056
Tel: (847) 297-0070
Fax: (847) 699-7864

Western Regional Office
Toko America, Inc.
2480 North First Street , Suite 260
San Jose, CA 95131
Tel: (408) 432-8281
Fax: (408) 943-9790

Eastern Regional Office
Toko America, Inc.
107 Mill Plain Road
Danbury, CT 06811
Tel: (203) 748-6871
Fax: (203) 797-1223

Semiconductor Technical Support
Toko Design Center
4755 Forge Road
Colorado Springs, CO 80907
Tel: (719) 528-2200
Fax: (719) 528-2375

Visit our Internet site at http://www.tokoam.com

IC-228-TK11042
0798O0.0K

January 1999 TOKO, Inc.
Printed in the USA