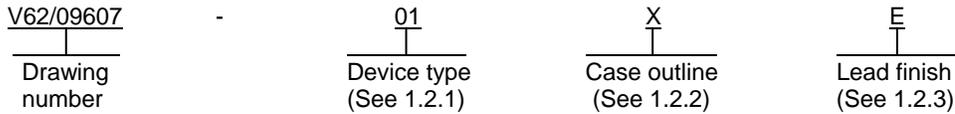




1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance programmable digital temperature sensor microcircuit, with an operating temperature range of -55°C to +125°C.

1.2 Vendor Item Drawing Administrative Control Number. The manufacturers PIN is the item of identification. The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation:



1.2.1 Device type(s).

<u>Device type</u>	<u>Generic</u>	<u>Circuit function</u>
01	TMP122-EP	Programmable digital temperature sensor

1.2.2 Case outline(s). The case outline(s) are as specified herein.

<u>Outline letter</u>	<u>Number of pins</u>	<u>JEDEC PUB 95</u>	<u>Package style</u>
X	6	MO-178-AB	Plastic small outline package

1.2.3 Lead finishes. The lead finishes are as specified below or other lead finishes as provided by the device manufacturer:

<u>Finish designator</u>	<u>Material</u>
A	Hot solder dip
B	Tin-lead plate
C	Gold plate
D	Palladium
E	Gold flash palladium
Z	Other

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	SIZE <b>A</b>	CODE IDENT NO. <b>16236</b>	DWG NO. <b>V62/09607</b>
		REV	PAGE 2

1.3 Absolute maximum ratings. 1/

Power supply voltage (V+)	7.0 V
Input voltage range (V <sub>IN</sub> )	-0.3 V to 7.0 V
Input current	10 mA
Operating temperature range (T <sub>A</sub> )	-55°C to +150°C
Storage temperature range (T <sub>STG</sub> )	-60°C to 150°C
Maximum junction temperature (T <sub>J</sub> )	150°C
Leading temperature (soldering)	300°C

1.4 Recommended operating conditions. 2/

Supply voltage range (V+)	2.7 V to 5.5 V
Operating free-air temperature range (T <sub>A</sub> )	-55°C to +125°C

- 1/ Stresses beyond those listed under “absolute maximum rating” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- 2/ Use of this product beyond the manufacturers design rules or stated parameters is done at the user's risk. The manufacturer and/or distributor maintain no responsibility or liability for product used beyond the stated limits.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 3

## 2. APPLICABLE DOCUMENTS

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Applications for copies should be addressed to the Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834 or online at <http://www.jedec.org>)

## 3. REQUIREMENTS

3.1 Marking. Parts shall be permanently and legibly marked with the manufacturer's part number as shown in 6.3 herein and as follows:

- A. Manufacturer's name, CAGE code, or logo
- B. Pin 1 identifier
- C. ESDS identification (optional)

3.2 Unit container. The unit container shall be marked with the manufacturer's part number and with items A and C (if applicable) above.

3.3 Electrical characteristics. The maximum and recommended operating conditions and electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.4 Design, construction, and physical dimension. The design, construction, and physical dimensions are as specified herein.

3.5 Diagrams.

3.5.1 Case outline. The case outline shall be as shown in 1.2.2 and figure 1.

3.5.2 Terminal connections. The terminal connections shall be as shown in figure 2.

3.5.3 Logic diagram. The logic diagram shall be as shown in figure 3.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 4

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions V+ = 2.7 V to 5.5 V	Temperature, T <sub>A</sub>	Device type	Limits		Unit		
					Min	Max			
Temperature input section									
Range				01	-55	+125	°C		
Accuracy (temperature error)			-25°C to +85°C			±1.5	°C		
			-55°C to +125°C			±2.0			
			-55°C to +150°C		±1.5 typical				
Temperature input versus supply voltage			-55°C to +125°C		0.1 typical		°C/V		
Resolution 2/		Selectable		±0.0625 typical		°C			
Digital input/output section									
High input logic level	V <sub>IH</sub>		-55°C to +125°C	01	0.7(V+)		V		
Low input logic level	V <sub>IL</sub>					0.3(V+)		V	
Input current, SO/I, SCK, $\overline{CS}$	I <sub>IN</sub>	0 V ≤ V <sub>IN</sub> ≤ V+					±1	μA	
Output logic levels	V <sub>OL</sub> SO/I	I <sub>SINK</sub> = 3 mA					0.4	V	
	V <sub>OH</sub> SO/I	I <sub>SOURCE</sub> = 2 mA				(V+) - 0.4			
	V <sub>OL</sub> ALERT	I <sub>SINK</sub> = 4 mA					0.4		
Leakage current, ALERT		0 V ≤ V <sub>IN</sub> ≤ 6 V					±1	μA	
Input capacitance, SO/I, SCK, $\overline{CS}$ , ALERT	C <sub>IN</sub>						2.5 typical		pF
Resolution 2/		Selectable					9 to 12 + sign typical		bits
Conversion time		9 bit + sign					40	ms	
		10 bit + sign			80				
		11 bit + sign			160				
		12 bit + sign			320				

See footnotes at end of table.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 5

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V+ = 2.7 V to 5.5 V	Temperature, T <sub>A</sub>	Device type	Limits		Unit		
					Min	Max			
Power supply section									
Operating range	V+		-55°C to +125°C	01	2.7	5.5	V		
Quiescent current	I <sub>Q</sub>	Serial bus inactive					75	μA	
Shutdown current	I <sub>SD</sub>	Serial bus inactive					1	μA	
Temperature range section									
Specified range				01	-55	+125	°C		
Operating range							-55	+150	°C
Storage range							-60	+150	°C
Thermal resistance	θ <sub>JA</sub>	Case X	-55°C to +125°C		200 typical		°C/W		

1/ Testing and other quality control techniques are used to the extent deemed necessary to assure product performance over the specified temperature range. Product may not necessarily be tested across the full temperature range and all parameters may not necessarily be tested. In the absence of specific parametric testing, product performance is assured by characterization and/or design.

2/ Specified for 12-bit resolution.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 6

Case X

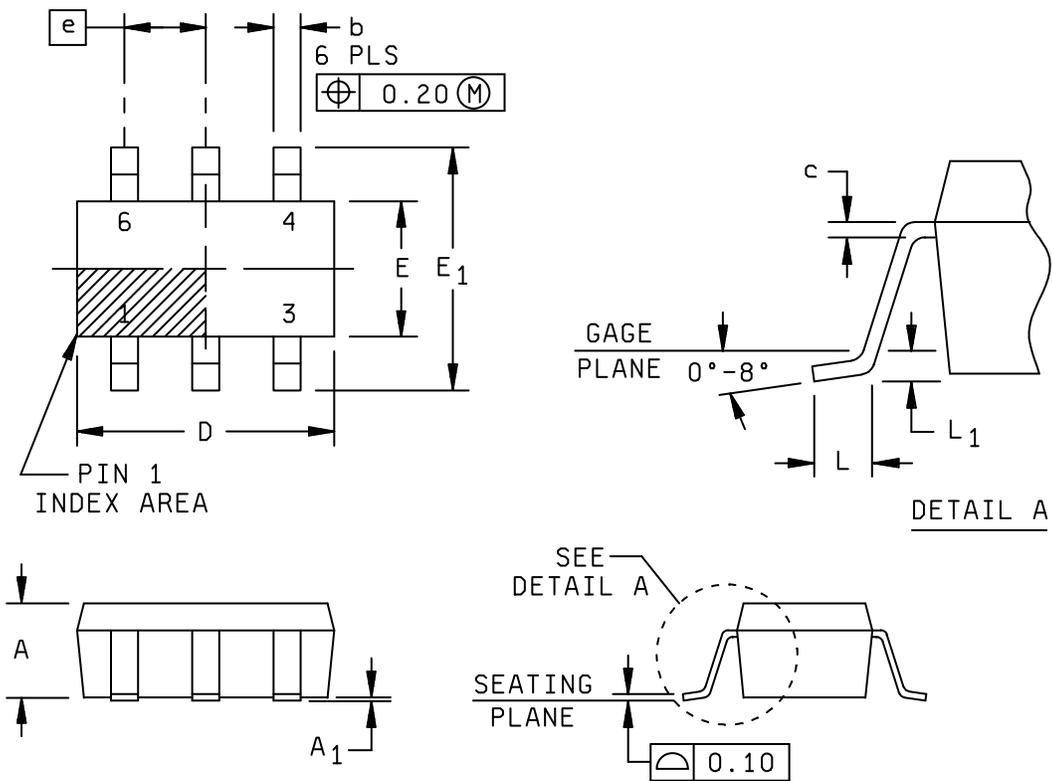


FIGURE 1. Case outline.

<p><b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b></p>	<p><b>SIZE A</b></p>	<p><b>CODE IDENT NO. 16236</b></p>	<p><b>DWG NO. V62/09607</b></p>
		<p>REV</p>	<p>PAGE 7</p>

Case X

Symbol	Dimensions	
	Millimeters	
	Min	Max
A	---	1.45
A <sub>1</sub>	0.00	0.15
b	0.25	0.50
c	0.08	0.22
D	2.75	3.05
E	1.45	1.75
E <sub>1</sub>	2.60	3.00
e	0.95 NOM	
L	0.30	0.55
L <sub>1</sub>	0.25 NOM	

NOTES:

1. All linear dimensions are in millimeters.
2. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 mm per side.
3. Leads 1, 2, 3 may be wider than leads 4, 5, 6 for package orientation.
4. Falls within JEDEC MO-178 variation AB, except minimum lead width.

FIGURE 1. Case outline – Continued.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 8

Device type	01
Case outline	X
Terminal number	Terminal symbol
1	ALERT
2	GND
3	V+
4	SCK
5	$\overline{\text{CS}}$
6	SO/I

Terminal symbol	I/O	Description
ALERT	O	Alert status pin
GND	---	Ground
V+	---	Supply voltage
SCK		Serial clock
$\overline{\text{CS}}$		Chip select
SO/I		Serial output/input data

FIGURE 2. Terminal connections.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		REV	PAGE 9

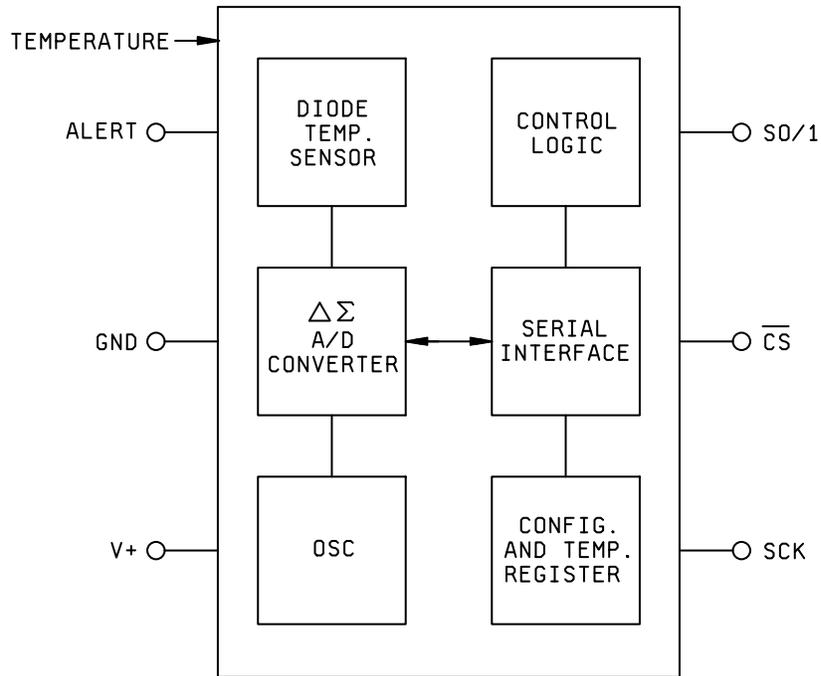


FIGURE 3. Logic diagram.

<p><b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b></p>	<p><b>SIZE A</b></p>	<p><b>CODE IDENT NO. 16236</b></p>	<p><b>DWG NO. V62/09607</b></p>
		<p>REV</p>	<p>PAGE 10</p>

4. VERIFICATION

4.1 Product assurance requirements. The manufacturer is responsible for performing all inspection and test requirements as indicated in their internal documentation. Such procedures should include proper handling of electrostatic sensitive devices, classification, packaging, and labeling of moisture sensitive devices, as applicable.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Preservation, packaging, labeling, and marking shall be in accordance with the manufacturer's standard commercial practices for electrostatic discharge sensitive devices.

6. NOTES

6.1 ESDS. Devices are electrostatic discharge sensitive and are classified as ESDS class 1 minimum.

6.2 Configuration control. The data contained herein is based on the salient characteristics of the device manufacturer's data book. The device manufacturer reserves the right to make changes without notice. This drawing will be modified as changes are provided.

6.3 Suggested source(s) of supply. Identification of the suggested source(s) of supply herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item.

Vendor item drawing administrative control number <u>1/</u>	Device manufacturer CAGE code	Vendor part number	Top-side marking
V62/09607-01XE	01295	TMP122AMDBVTEP	122E

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.

CAGE code

01295

Source of supply

Texas Instruments, Inc.  
 Semiconductor Group  
 8505 Forest Lane  
 P.O. Box 660199  
 Dallas, TX 75243  
 Point of contact: U.S. Highway 75 South  
 P.O. Box 84, M/S 853  
 Sherman, TX 75090-9493

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/09607</b>
		<b>REV</b>	<b>PAGE 11</b>