



**THE DATASHEET OF  
AP2602FNTR-G1**



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**Octave Remote Resistor-programmable Temperature Switches AP2602**

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## General Description

The AP2602 are fully integrated, resistor programmable octave remote temperature switches with selectable external/internal trigger voltages setting. The thresholds are set by external resistors and thermistors with negative temperature coefficient.

The AP2602 provides 4 open-drain, active low, over-temperature outputs for each 2 sensors. These switches operate with a 2.7V to 5.5V single supply.

The AP2602 are available in 16-pin QFN-3X3-16 package.

## Features

- 8 Remote Temperature Switches Set by Thermistor and External Resistors
- 4 Open-drain Active Low Output Stages for Each 2 Temperature Switches
- Selectable External/Internal Trigger Voltages Setting
- Built-in Hysteresis Temperature when Using Internal Setting Trigger Voltage
- Guaranteed Output Signal Valid to  $V_{CC}=0.8V$
- QFN-3X3-16 Package

## Applications

- $\mu P$  Temperature Monitoring High-speed Computers
- Temperature Control
- Temperature Alarms
- Fan Control
- Automotives

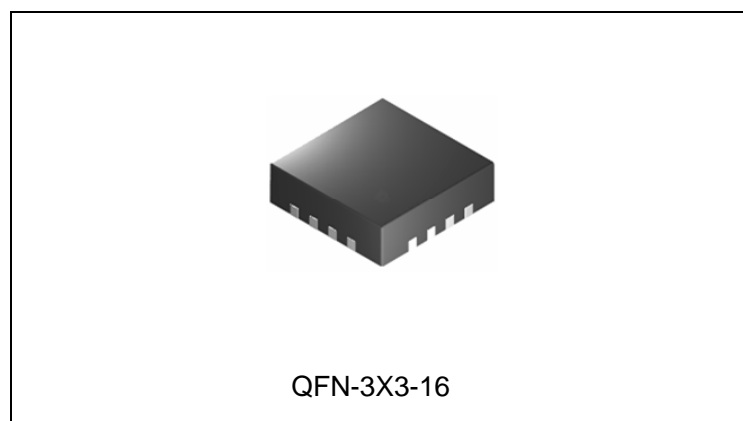
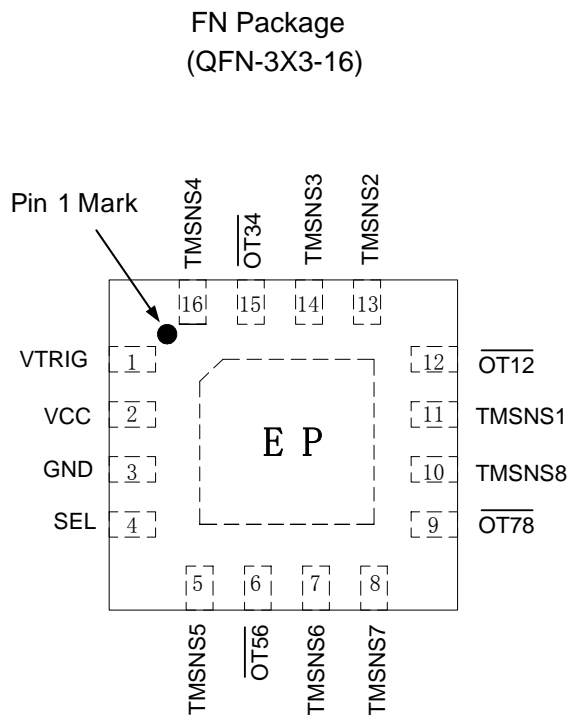


Figure 1. Package Type of AP2602

## Octave Remote Resistor-programmable Temperature Switches AP2602

### Pin Configuration



Note 1: Recommend connecting the thermal pad to GND for excellent power dissipation.

Figure 2. Pin Configuration of AP2602 (Top View)

### Pin Description

Pin Number	Pin Name	Function
1	VTRIG	Input of external setting trigger voltage
2	VCC	Power-supply input
3	GND	Ground
4	SEL	Connect SEL to GND to select external trigger voltage, while connecting SEL to VCC to select internal trigger voltage. Don't leave the pin floating
5,7,8,10,11,13,14,16	TMSNSX	Connect an external 1% resistor from TMSNSX to GND to set trigger point of remote temperature sensorX
6,9,12,15	$\overline{\text{OTXY}}$	Open-Drain, active low, over-temperature output for sensor 1, 2, sensor 3, 4, sensor 5, 6, sensor 7, 8 respectively. The $\overline{\text{OTXY}}$ outputs are the wire-or results of sensorX and sensorY

**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Functional Block Diagram**

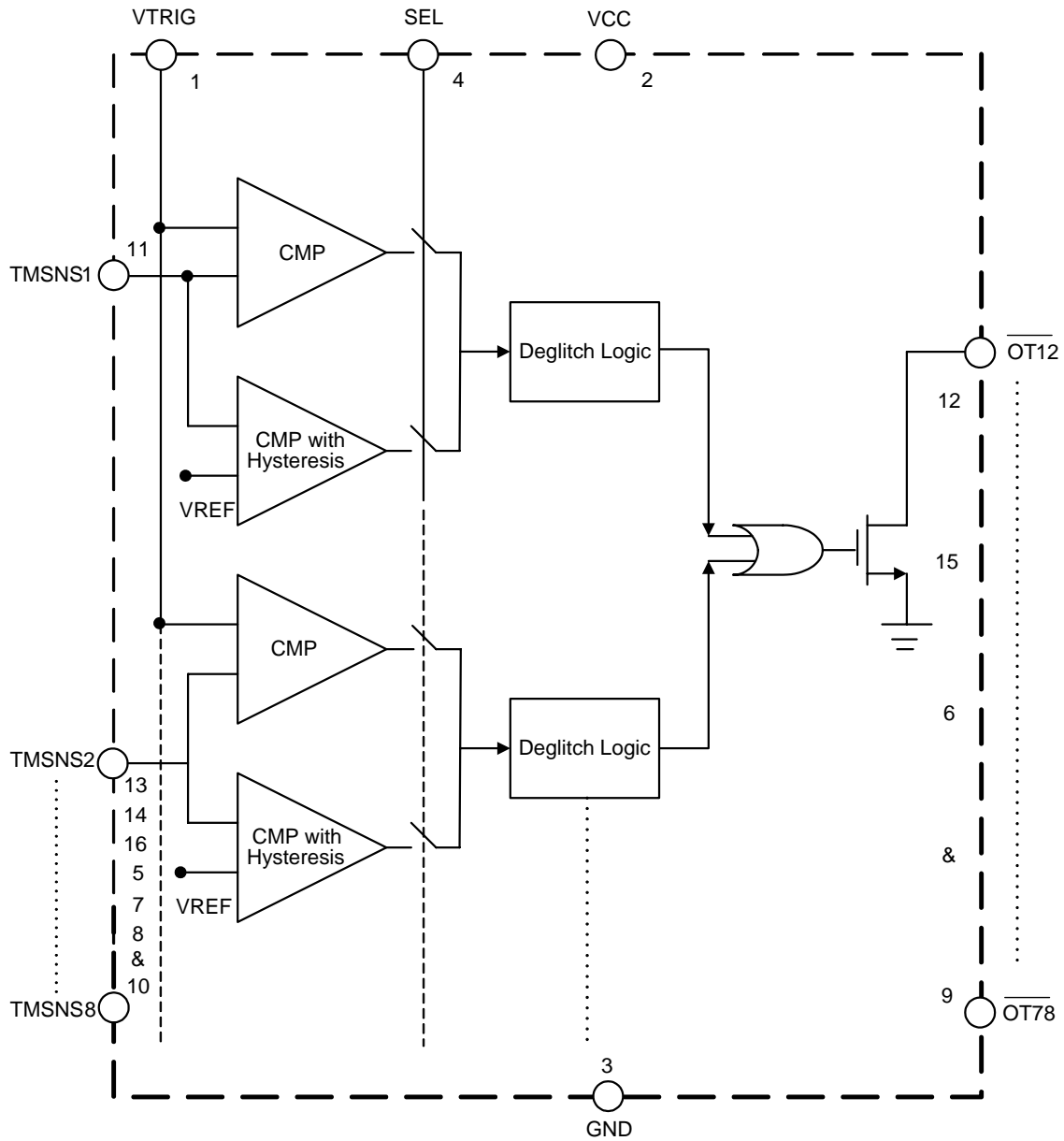


Figure 3. Functional Block Diagram of AP2602





**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Recommended Operating Conditions**

Parameter	Symbol	Min	Max	Unit
Supply Voltage	$V_{CC}$	2.7	5.5	V
Operating Ambient Temperature Range	$T_A$	-40	125	°C

**Electrical Characteristics**

$V_{CC}=2.7V$  to  $5.5V$ ,  $T_A=-40^{\circ}C$  to  $125^{\circ}C$ , unless otherwise specified. Typical values are at  $T_A=25^{\circ}C$ .

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	$V_{CC}$		2.7		5.5	V
Supply Current	$I_{CC}$	$V_{CC}=3.3V$ $\overline{OTXY}$ float	$V_{TMSNSX}=V_{CC}$	40	100	$\mu A$
			$V_{TMSNSX}=GND$	55	110	
TMSNSX Input Threshold	$V_{TH}/V_{CC}$	$V_{CC}=5V$ , $V_{SEL}=V_{CC}$ , $V_{TH}/V_{CC}$	0.244	0.25	0.256	V/V
		$V_{CC}=3.3V$ , $V_{SEL}=V_{CC}$ , $V_{TH}/V_{CC}$	0.24	0.25	0.26	
VTRIG Input Range	$V_{TRIG}$	$0 < V_{TRIG} < 0.4 \times V_{CC}$	0.5		$0.4 \times V_{CC}$	V
Offset Voltage between VTRIG and TMSNSX	$V_{OS}$	$V_{CC}=5V$ , $V_{SEL}=GND$	-15		15	mV
SEL Input Voltage	$V_{IH}$	$V_{CC}=5V$	2			V
	$V_{IL}$	$V_{CC}=5V$			1	V
Open-drain $\overline{OTXY}$ Output Sink Current	$I_{SINK}$	$V_{OT}=0.3V$ , $V_{TMSNSX}=0V$	3	4.5		mA
Open-drain $\overline{OTXY}$ Output Leakage Current	$I_{LEAK-OT}$	$V_{OT}=V_{CC}$ , $V_{TMSNSX}=5V$			1	$\mu A$
Thermal Resistance	$\theta_{JC}$	QFN-3X3-16		4.2		°C/W



**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Typical Performance Characteristics**

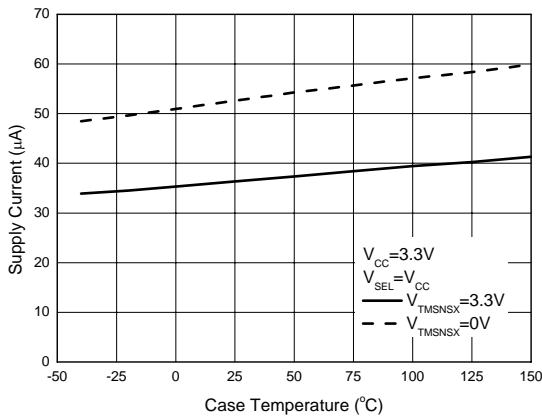


Figure 4. Supply Current vs. Case Temperature

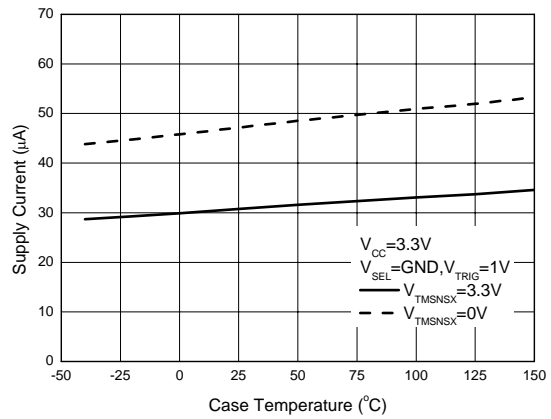


Figure 5. Supply Current vs. Case Temperature

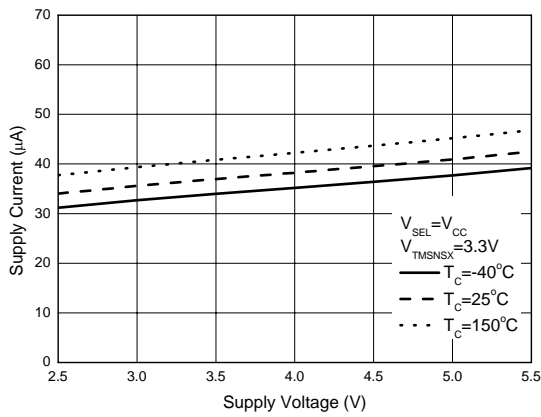


Figure 6. Supply Current vs. Supply Voltage

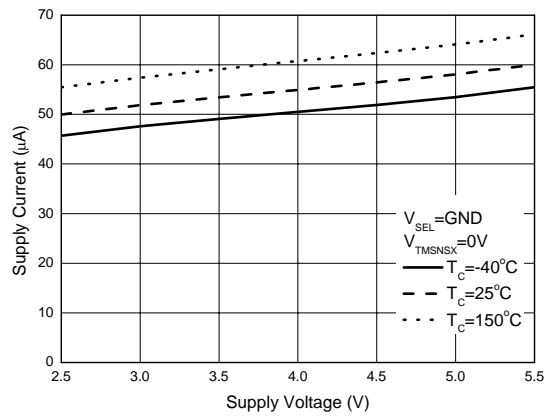


Figure 7. Supply Current vs. Supply Voltage

**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Typical Performance Characteristics (Continued)**

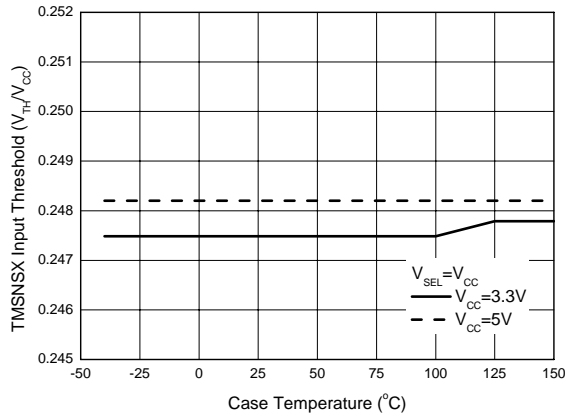


Figure 8. TMSNSX Input Threshold ( $V_{TH}/V_{CC}$ ) vs. Case Temperature

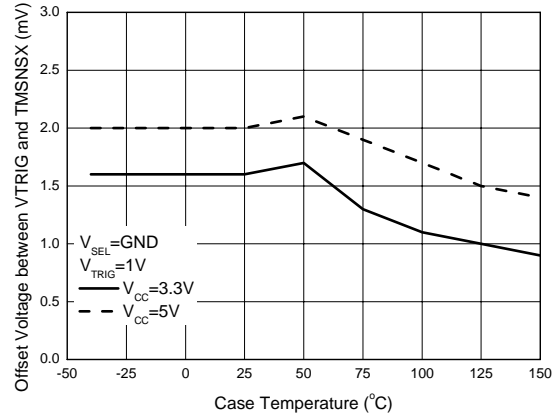


Figure 9. Offset Voltage between VTRIG and TMSNSX vs. Case Temperature

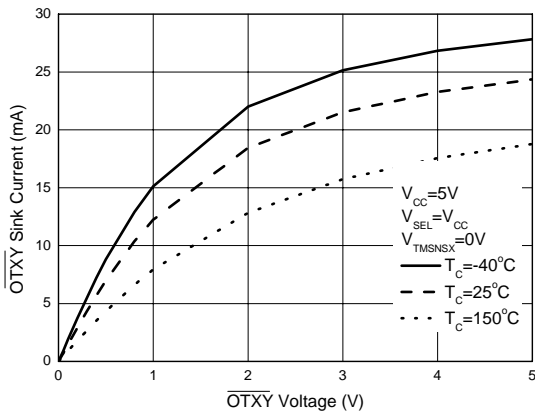


Figure 10. Open-drain  $\overline{OTXY}$  Output Sink Current vs.  $\overline{OTXY}$  Voltage

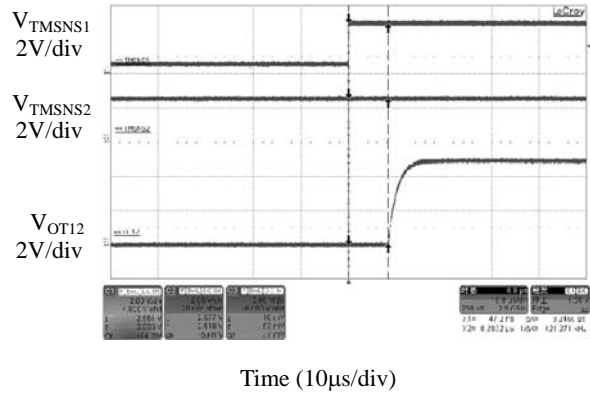
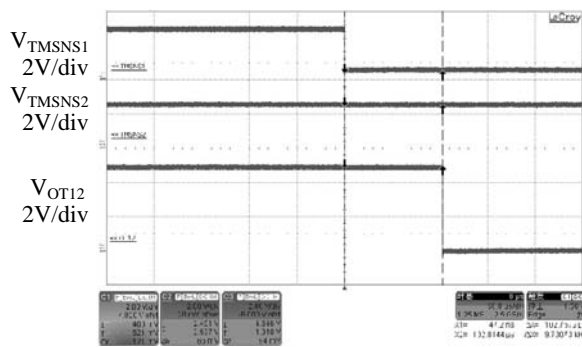


Figure 11. Deglitch time to OT High ( $V_{SEL}=V_{CC}$ )  
(Conditions:  $V_{CC}=5V$ ,  $V_{TMSNS1}=0.5V$  to  $3V$ ,  $V_{TMSNS2}=2.5V$ )

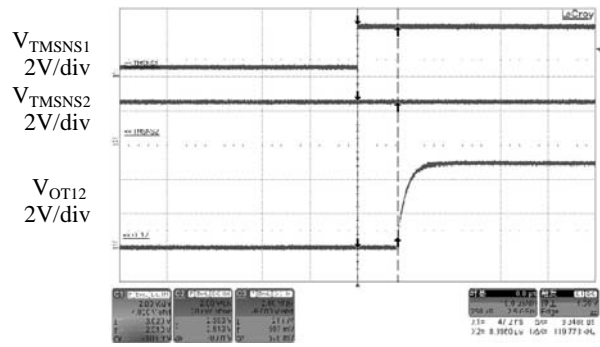
**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Typical Performance Characteristics (Continued)**



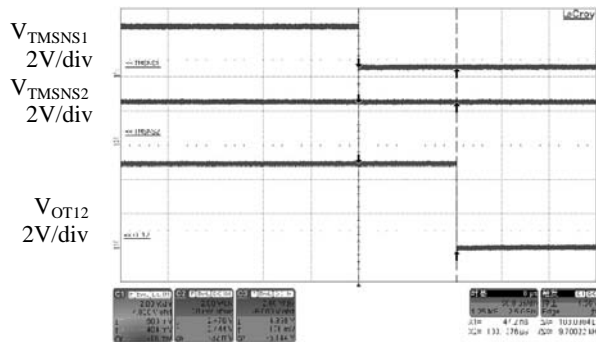
Time (50µs/div)

Figure 12. Deglitch time to OT Low ( $V_{SEL}=V_{CC}$ )  
 (Conditions:  $V_{CC}=5V$ ,  $V_{TMSNS1}=0.5V$  to  $3V$ ,  
 $V_{TMSNS2}=2.5V$ )



Time (10µs/div)

Figure 13. Deglitch time to OT High ( $V_{SEL}=GND$ )  
 (Conditions:  $V_{CC}=5V$ ,  $V_{TMSNS1}=0.5V$  to  $3V$ ,  
 $V_{TMSNS2}=2.5V$ ,  $V_{TRIG}=1V$ )



Time (50µs/div)

Figure 14. Deglitch Time to OT Low ( $V_{SEL}=GND$ )  
 (Conditions:  $V_{CC}=5V$ ,  $V_{TMSNS1}=0.5V$  to  $3V$ ,  
 $V_{TMSNS2}=2.5V$ ,  $V_{TRIG}=1V$ )

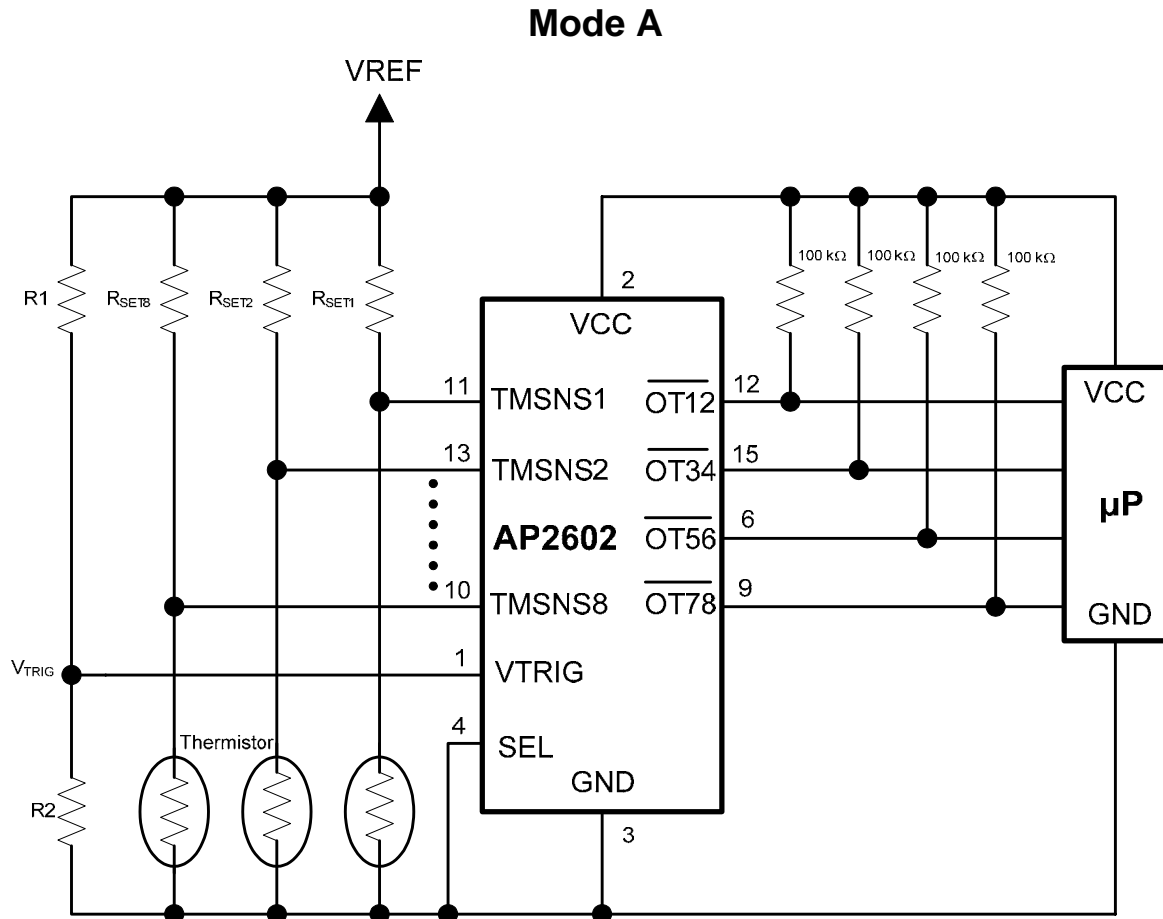
**Octave Remote Resistor-programmable Temperature Switches AP2602**
**Typical Application**


Figure 15. Typical Application of AP2602 (Mode A)

**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Typical Application (Continued)**

**Mode B**

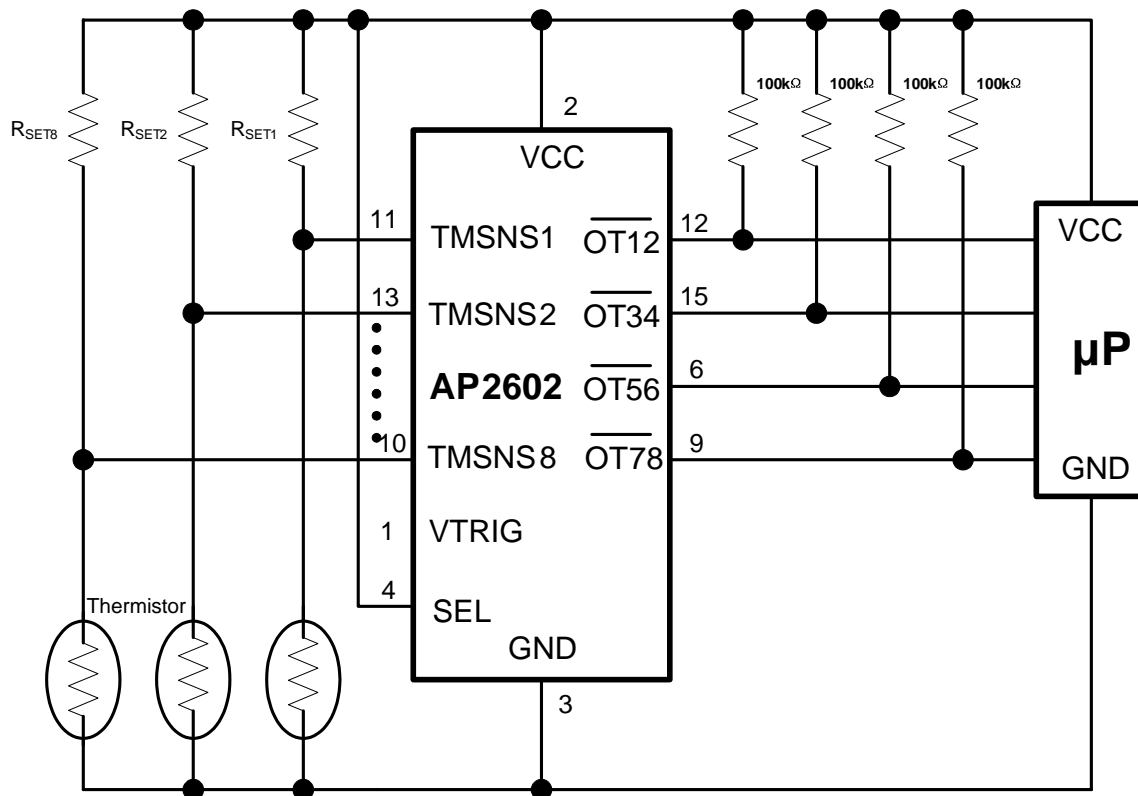


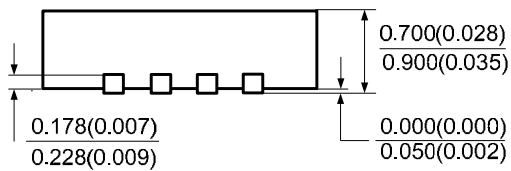
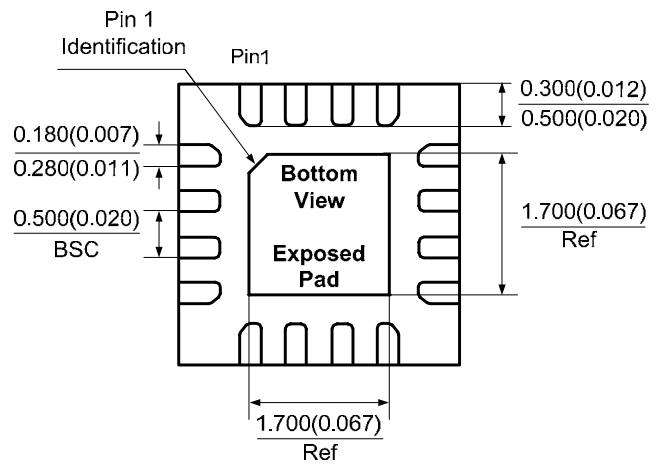
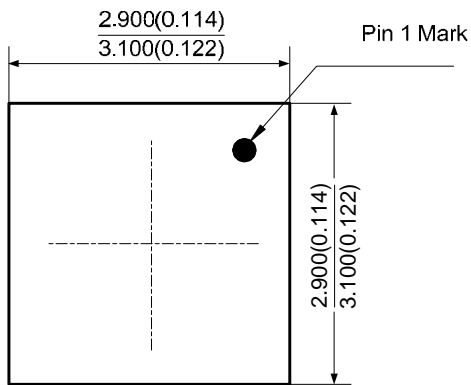
Figure 16. Typical Application of AP2602 (Mode B)

**Octave Remote Resistor-programmable Temperature Switches AP2602**

**Mechanical Dimensions**

**QFN-3x3-16**

**Unit: mm(inch)**





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#### **MAIN SITE**

##### **- Headquarters**

##### **BCD Semiconductor Manufacturing Limited**

No. 1600, Zi Xing Road, Shanghai ZiZhu Science-based Industrial Park, 200241, China  
Tel: +86-21-24162266, Fax: +86-21-24162277

##### **- Wafer Fab**

##### **Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd.**

800 Yi Shan Road, Shanghai 200233, China  
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

#### **REGIONAL SALES OFFICE**

##### **Shenzhen Office**

##### **Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd., Shenzhen Office**

Unit A Room 1203, Skyworth Bldg., Gaoxin Ave. 1.S., Nanshan District, Shenzhen, China  
Tel: +86-755-8826 7951  
Fax: +86-755-8826 7865

##### **Taiwan Office**

##### **BCD Semiconductor (Taiwan) Company Limited**

4F, 298-1, Rui Guang Road, Nei-Hu District, Taipei, Taiwan  
Tel: +886-2-2656 2808  
Fax: +886-2-2656 2806

##### **USA Office**

##### **BCD Semiconductor Corp.**

30920 Huntwood Ave. Hayward, CA 94544, USA  
Tel : +1-510-324-2988  
Fax: +1-510-324-2788

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