

5V, Dual Trip Point Temperature Sensors

Features

- User Programmable Hysteresis and Temperature Set Point
- Easily Programs with Two External Resistors
- Wide Temperature Detection Range:
 - 0°C to 70°C: (TC620/TC621CCX)
 - -40°C to +125°C: (TC620/TC621CVX)
 - -40°C to +85°C: (TC620/TC621CEX)
- Onboard Temperature Sensing Applications (TC620X)
- External NTC Thermistor for Remote Sensing Applications (TC621X)
- Available in 8-Pin PDIP and SOIC Packages

Applications

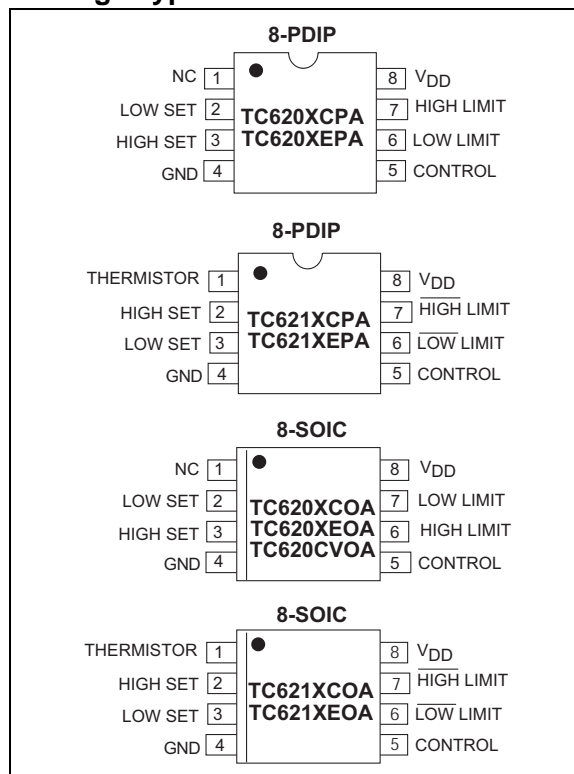
- Power Supply Over Temperature Detection
- Consumer Equipment
- Temperature Regulators
- CPU Thermal Protection

Device Selection Table

Part Number	Package	Temperature Range
TC620X*COA	8-Pin SOIC	0°C to +70°C
TC620X*CPA	8-Pin PDIP	0°C to +70°C
TC620X*EOA	8-Pin SOIC	-40°C to +85°C
TC620X*EPA	8-Pin PDIP	-40°C to +85°C
TC620C*VOA	8-Pin SOIC	-40°C to +125°C
TC621X*COA	8-Pin SOIC	0°C to +70°C
TC621X*CPA	8-Pin PDIP	0°C to +70°C
TC621X*EOA	8-Pin SOIC	-40°C to +85°C
TC621X*EPA	8-Pin PDIP	-40°C to +85°C
TC621C*VOA	8-Pin SOIC	-40°C to +125°C

Note: *The part code will be C or H (see Functional Block Diagrams).

Package Type



General Description

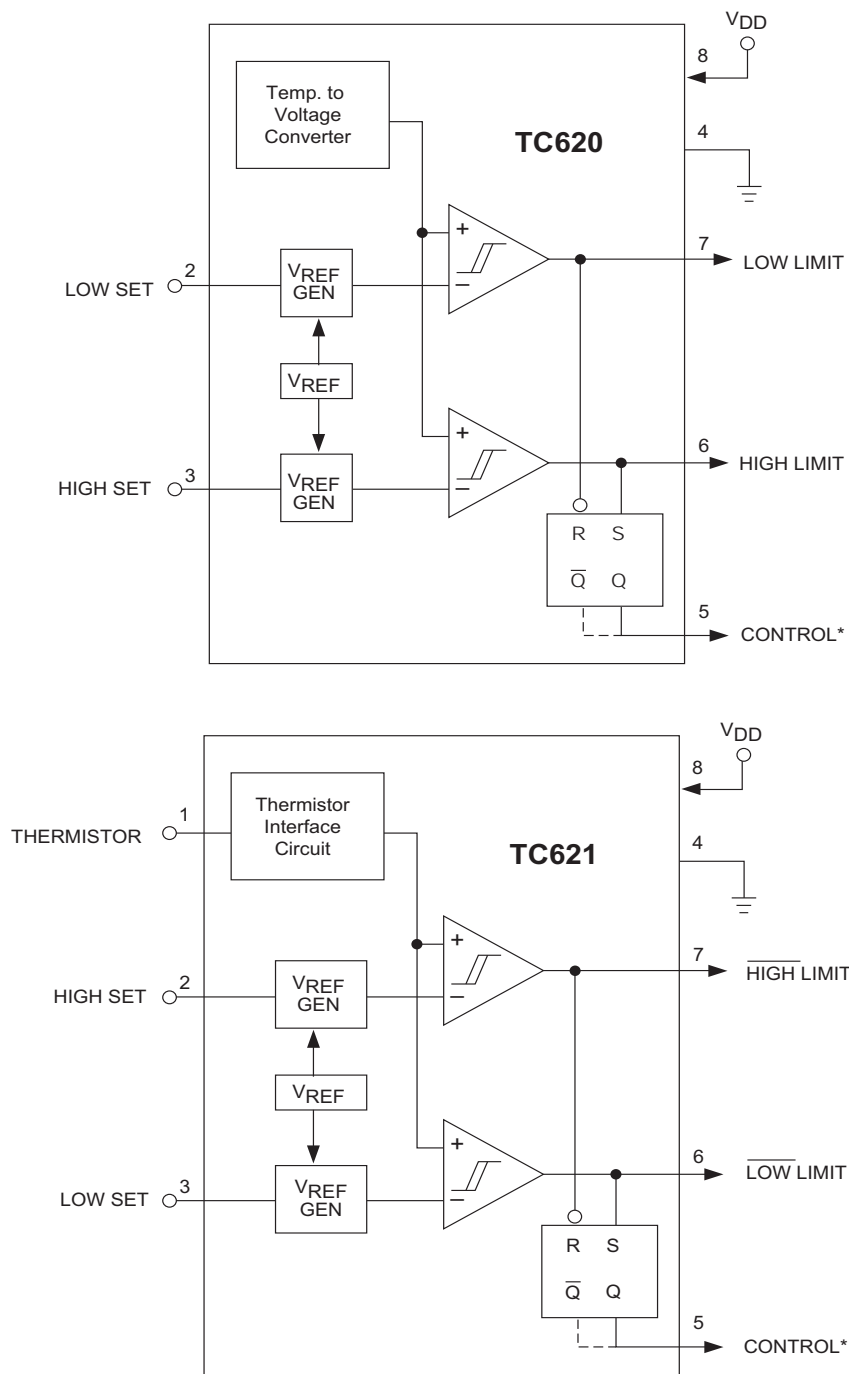
The TC620 and TC621 are programmable logic output temperature detectors designed for use in thermal management applications. The TC620 features an onboard temperature sensor, while the TC621 connects to an external NTC thermistor for remote sensing applications.

Both devices feature dual thermal interrupt outputs (HIGH LIMIT and LOW LIMIT), each of which is programmed with a single external resistor. On the TC620, these outputs are driven active (high) when measured temperature equals the user programmed limits. The CONTROL (hysteresis) output is driven high when temperature equals the high limit setting and returns low when temperature falls below the low limit setting. This output can be used to provide ON/OFF control to a cooling fan or heater. The TC621 provides the same output functions except that the logical states are inverted.

The TC620/TC621 are usable over operating temperature ranges of 0°C to 70°C, -40°C to +125°C.

TC620/TC621

Functional Block Diagrams



*Suffix code "C" denotes cooling option (High true CONTROL output).
 Suffix code "H" denotes heating option (Low true CONTROL output).

1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings*

Supply Voltage	20V
Input Voltage Any Input.. (GND – 0.3V) to (V _{DD} +0.3V)	
Package Power Dissipation (T _A ≤ 70°C)	
PDIP	730 mW
SOIC	470 mW
Derating Factors:	
Plastic	8 mW/°C
Operating Temperature:	
V Version	-40°C to +125°C
E Version	-40°C to +85°C
C Version	0°C to +70°C
Storage Temperature	-65°C to +150°C

*Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operation sections of the specifications is not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

TC620/TC621 ELECTRICAL SPECIFICATIONS

Electrical Characteristics: T _A = 25°C, unless otherwise specified.						
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V _{DD}	Supply Voltage Range	4.5	—	18	V	
I _{DD}	Supply Current	—	270	400	μA	5V ≤ V _{DD} ≤ 18V
R _{OUT}	Output Resistance	—	400	1000	Ω	Output High or Low, 5V ≤ V _{DD} ≤ 18V
I _{OUT}	Output Current	—	—	1	mA	Temp. Sensed Source/Sink
I _{OUT}	Output Current	—	—	1	mA	Cool/Heat Source/Sink
T _{ERR}	Absolute Accuracy	T - 3	T	T + 3	°C	T = Programmed Temperature

TEMPERATURE CHARACTERISTICS

Electrical Specifications: Unless otherwise noted, all parameters apply with 4.5V ≤ V _{DD} ≤ 18V.						
Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Temperature Ranges						
Specified Temperature Range (C)	T _A	0	—	+70	°C	
Specified Temperature Range (E)	T _A	-40	—	+85	°C	
Specified Temperature Range (V)	T _A	-40	—	+125	°C	
Maximum Junction Temperature	T _J	—	—	+150	°C	
Storage Temperature Range	T _A	-65	—	+150	°C	
Package Thermal Resistances						
Thermal Resistance, 8L-PDIP	θ _{JA}	—	125	—	°C/W	
Thermal Resistance, 8L-SOIC	θ _{JA}	—	155	—	°C/W	

TC620/TC621

2.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in [Table 2-1](#).

TABLE 2-1: TC620 PIN FUNCTION TABLE

Pin No. (8-Pin PDIP) (8-Pin SOIC)	Symbol	Description
1	NC	No Internal Connection.
2	LOW SET	Low temperature set point. Connect an external 1% resistor from LOW SET to V_{DD} to set trip point.
3	HIGH SET	High temperature set point. Connect an external 1% resistor from HIGH SET to V_{DD} to set trip point.
4	GND	Ground Terminal.
5	CONTROL	Control output.
6	HIGH LIMIT	High temperature push/pull output.
7	LOW LIMIT	Low temperature push/pull output.
8	V_{DD}	Power supply input.

TABLE 2-2: TC621 PIN FUNCTION TABLE

Pin No. (8-Pin PDIP) (8-Pin SOIC)	Symbol	Description
1	THERMISTOR	Thermistor input.
2	HIGH SET	High temperature set point. Connect an external 1% resistor from HIGH SET to V_{DD} to set trip point.
3	LOW SET	Low temperature set point. Connect an external 1% resistor from LOW SET to V_{DD} to set trip point.
4	GND	Ground Terminal.
5	CONTROL	Control output.
6	$\overline{\text{LOW}} \text{ LIMIT}$	Low temperature push/pull output.
7	$\overline{\text{HIGH}} \text{ LIMIT}$	High temperature push/pull output.
8	V_{DD}	Power supply input.

3.0 DETAILED DESCRIPTION

The TC620 has a positive temperature coefficient temperature sensor and a dual threshold detector. Temperature set point programming is accomplished with external resistors from the HIGH SET and LOW SET inputs to V_{DD} . The HIGH LIMIT and LOW LIMIT outputs remain low as long as measured temperature is below set point values. As measured temperature increases, the LOW LIMIT output is driven high when temperature equals the LOW SET set point ($\pm 3^\circ\text{C}$ max). If temperature continues to climb, the HIGH LIMIT output is driven high when temperature equals the HIGH SET set point (Figure 3-1). The CONTROL (hysteresis) output is latched in its active state at the temperature specified by the HIGH SET resistor. CONTROL is maintained active until temperature falls to the value specified by the LOW SET resistor.

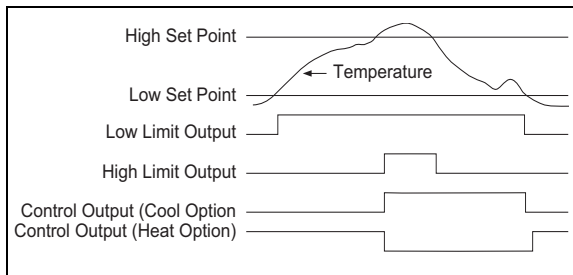


FIGURE 3-1: TC620/TC621 Input vs. Output Logic.

3.1 Programming the TC620

The resistor values to achieve the desired trip point temperatures on HIGH SET and LOW SET are calculated using Equation 3-1:

EQUATION 3-1:

$$R_{\text{TRIP}} = 0.5997 \times T^{2.1312}$$

Where:

R_{TRIP} = Programming resistor in Ohms
 T = The desired trip point temperature in degrees Kelvin.

For example, a 50°C setting on either the HIGH SET or LOW SET input is calculated using Equation 3-2 as follows:

EQUATION 3-2:

$$R_{\text{SET}} = 0.5997 \times ((50 + 273.15)^{2.1312}) = 133.6 \text{ k}\Omega$$

Care must be taken to ensure the LOW SET programming resistor is a smaller value than the HIGH SET programming resistor. Failure to do this will result in erroneous operation of the CONTROL output.

Care must also be taken to ensure the LOW SET temperature setting is at least 5°C lower than the HIGH SET temperature setting.

Figure 3-2 can help the user obtain an estimate of the external resistor values required for the desired LOW SET and HIGH SET trip points.

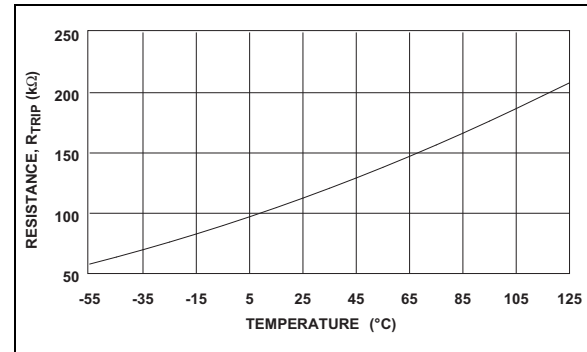


FIGURE 3-2: TC620 Sense Resistors vs. Trip Temperature.

3.2 Built-in Hysteresis

To prevent output “chattering” when measured temperature is at (or near) the programmed trip point values, the LOW SET and HIGH SET inputs each have built-in hysteresis of -2°C below the programmed settings (Figure 3-3).

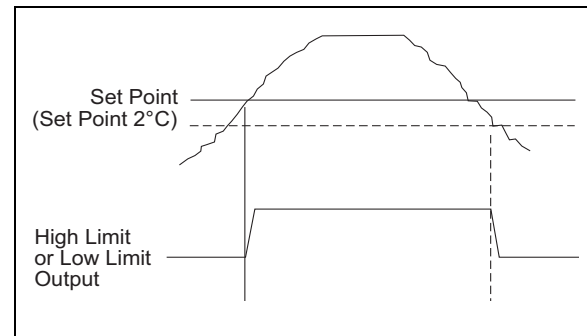


FIGURE 3-3: Built-In Hysteresis on Low Limit and High Limit Outputs.

As shown, the outputs remain in their active state (hysteresis) until temperature falls an additional 2°C below the user’s setting.

TC620/TC621

3.3 Using the TC621

The TC621 operation is similar to that of the TC620, but requires an external NTC thermistor. Use the resistance versus temperature curve of the thermistor to determine the values of the programming resistors. Note that the pin numbers for the HIGH SET and LOW SET programming resistors for the TC621 are reversed versus that of the TC620 (i.e., the resistor value on HIGH SET [Pin 2] should always be lower than the one connected to LOW SET [Pin 3]). Also note that the outputs of the TC621 are LOW TRUE when used with an NTC thermistor.

3.4 TC621 Thermistor Selection

The TC621 uses an external thermistor to monitor the controlling temperature. A thermistor with a resistance value of approximately 100 k Ω at 25°C is recommended.

A temperature set point is selected by picking a resistor whose value is equal to the resistance of the thermistor at the desired temperature. For example, using the data shown in [Figure 3-4](#), a 30 k Ω resistor between HIGH TEMP (Pin 2) and V_{DD} (Pin 8) sets the high temperature trip point at +51°C and a 49 k Ω resistor on LOW TEMP (Pin 3) sets the low temperature trip point to +41°C.

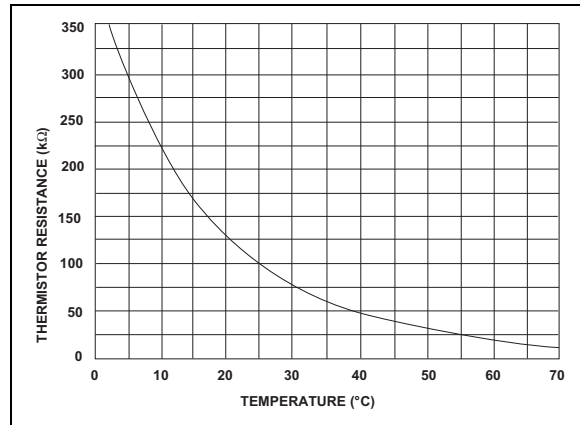


FIGURE 3-4: Typical NTC Thermistor.

3.5 TC620/TC621 Outputs

Both devices have complimentary output stages. They are rated at a source or sink current of 1 mA maximum.

4.0 TYPICAL APPLICATIONS

4.1 Dual Speed Temperature Control

In Figure 4-1, the Dual Speed Temperature Control uses a TC620 and a TC4469 quad driver. Two of the drivers of the TC4469 are configured in a simple oscillator. When the temperature is below the LOW TEMP set point, the output of the driver is OFF. When the temperature exceeds the LOW TEMP set point, the TC4469 gates the oscillator signal to the outputs of the driver. This square wave signal modulates the remaining outputs and drives the motor at a low speed. If this speed cannot keep the temperature below the HIGH TEMP set point, then the driver turns on continuously which increases the fan speed to high. The TC620 will monitor the temperature and only allow the fan to operate when needed and at the required speed to maintain the desired temperature. A higher power option can be designed by adding a resistor and a power MOSFET.

4.2 Temperature Controlled Fan

In the application in Figure 4-2, a high and a low temperature is selected by two R_L and R_H . The TC620 monitors the ambient temperature and turns the FET switch on when the temperature exceeds the HIGH TEMP set point. The fan remains on until the temperature decreases to the LOW TEMP set point. This provides the hysteresis. In this application, the fan turns on only when required.

The TC621 uses an external thermistor to monitor the ambient temperature. This adds one part, but allows more flexibility with the location of the temperature sensor.

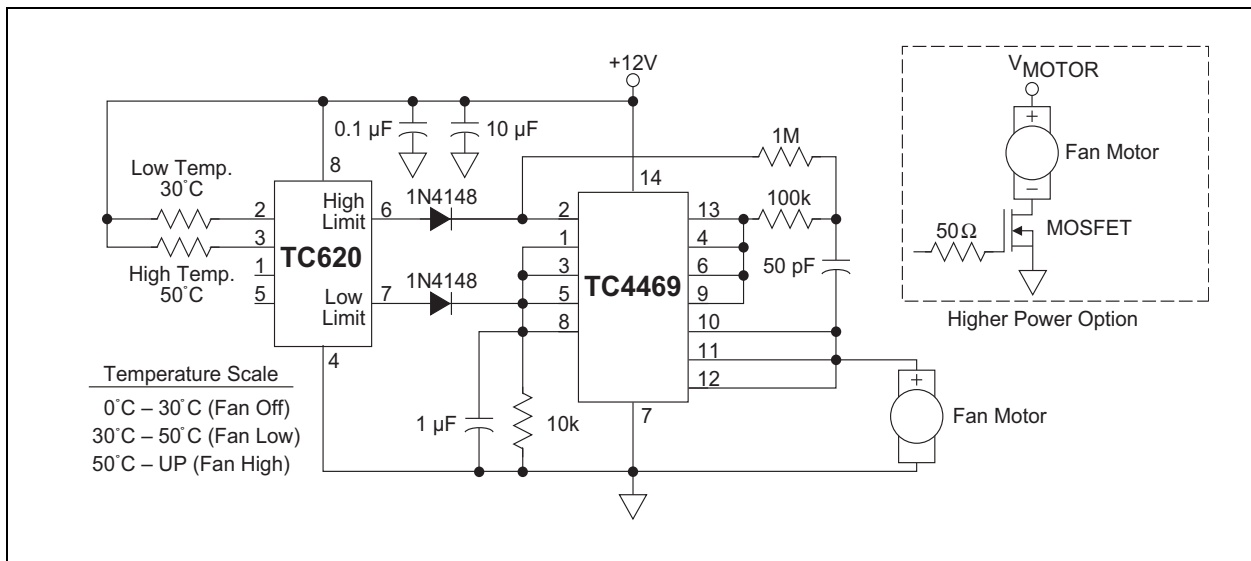


FIGURE 4-1: Dual Speed Temperature Control.

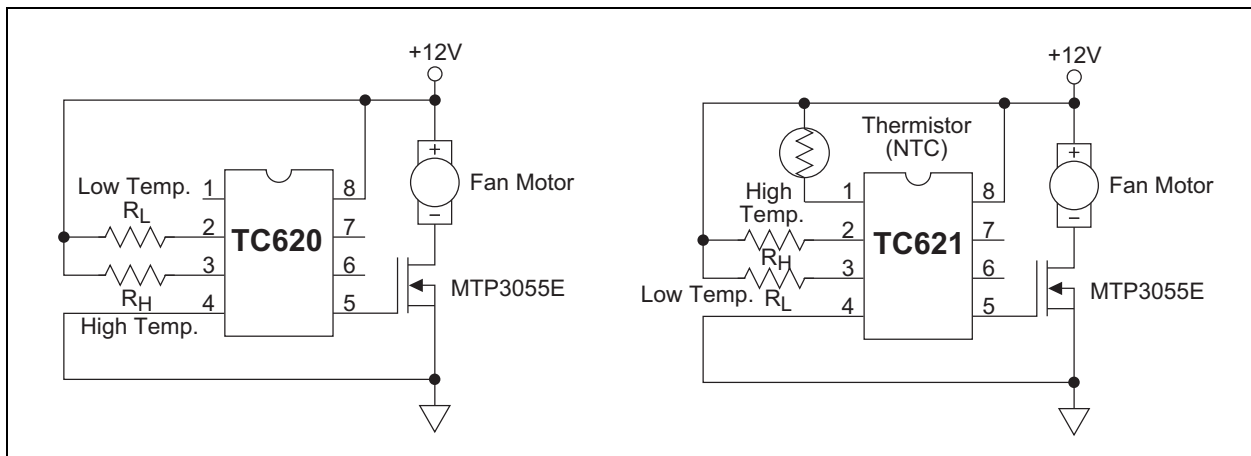


FIGURE 4-2: Temperature Controlled Fan.

TC620/TC621

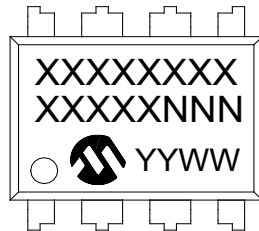


FIGURE 4-3: Heating and Cooling Application.

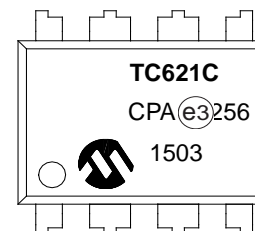
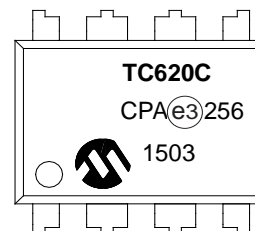
5.0 PACKAGING INFORMATION

5.1 Package Marking Information

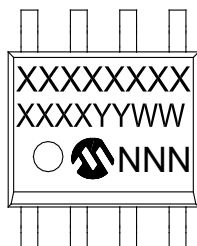
8-Lead PDIP (300 mil)



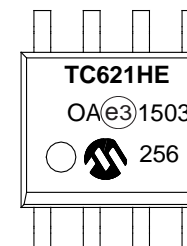
Example



8-Lead SOIC (150 mil)



Example



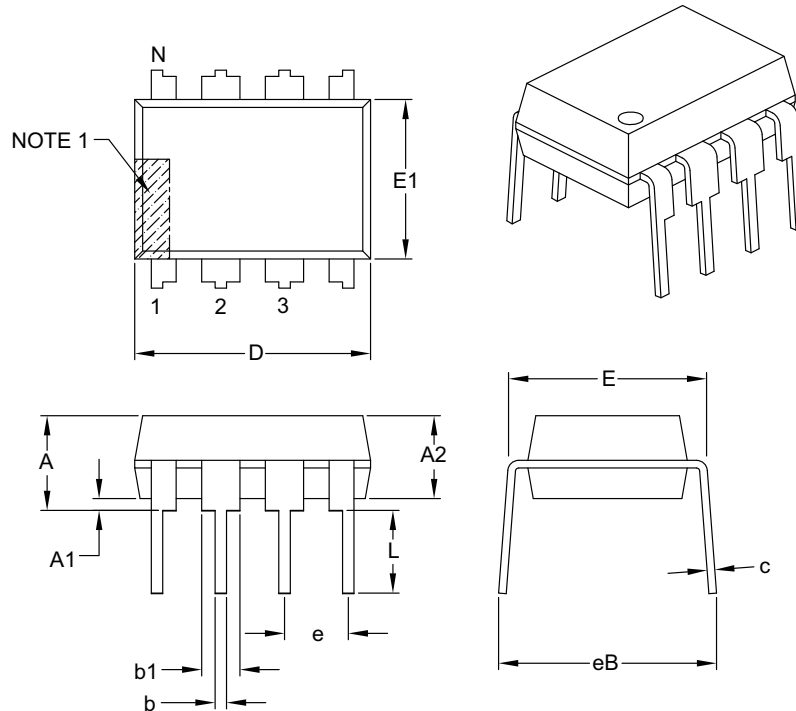
Legend:	XX...X	Customer-specific information
	Y	Year code (last digit of calendar year)
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week '01')
	NNN	Alphanumeric traceability code
	(e3)	Pb-free JEDEC® designator for Matte Tin (Sn)
	*	This package is Pb-free. The Pb-free JEDEC designator ((e3)) can be found on the outer packaging for this package.

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information.

TC620/TC621

8-Lead Plastic Dual In-Line (PA) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Dimension Limits	Units	INCHES		
		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.348	.365	.400
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

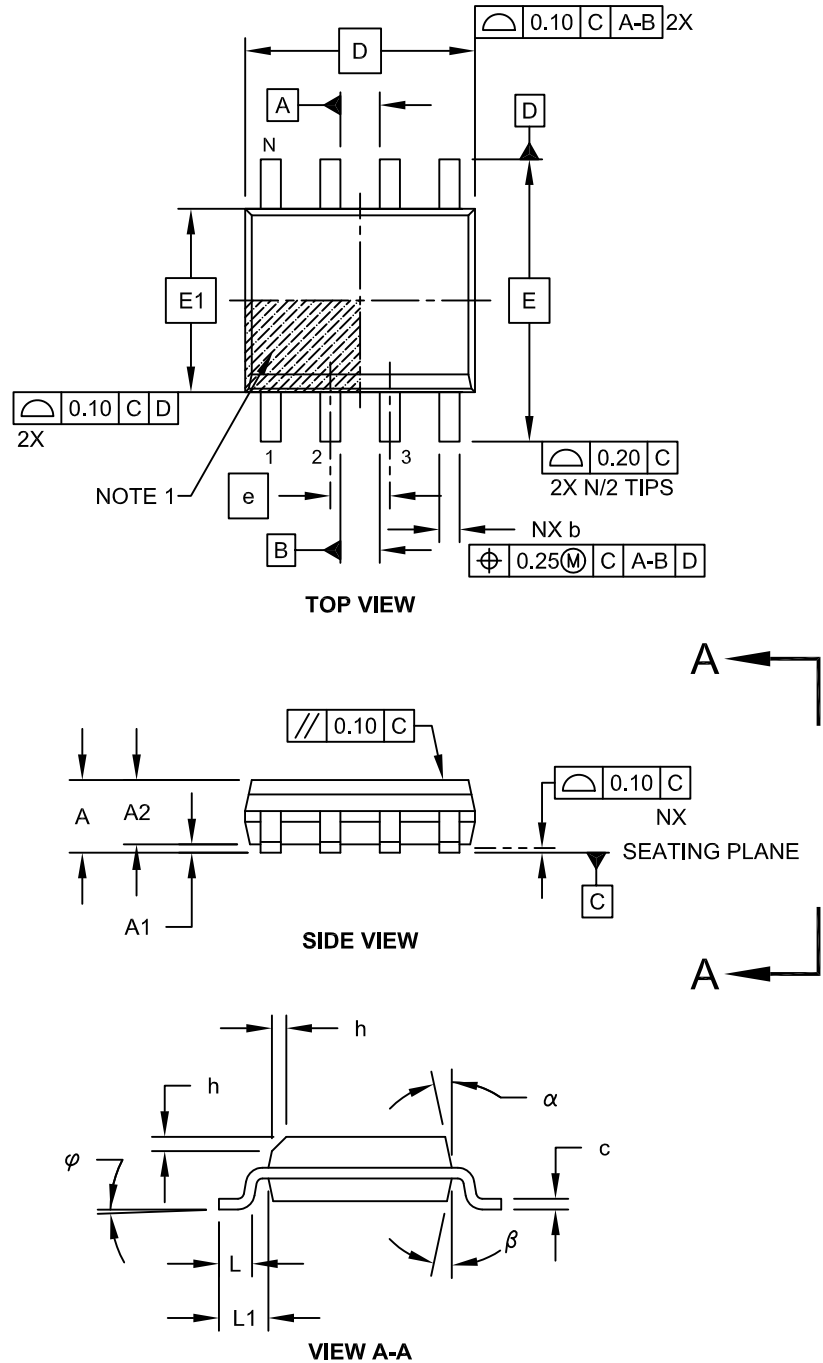
- Pin 1 visual index feature may vary, but must be located with the hatched area.
- § Significant Characteristic.
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-018B

8-Lead Plastic Small Outline (OA) - Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>

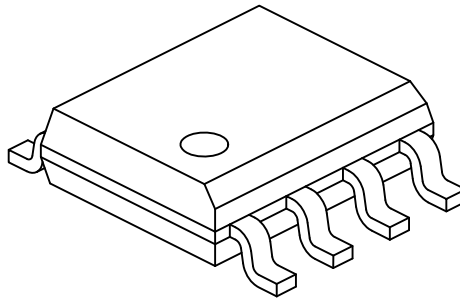


Microchip Technology Drawing No. C04-057C Sheet 1 of 2

TC620/TC621

8-Lead Plastic Small Outline (OA) - Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	-	-	1.75
Molded Package Thickness	A2	1.25	-	-
Standoff §	A1	0.10	-	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	4.90 BSC		
Chamfer (Optional)	h	0.25	-	0.50
Foot Length	L	0.40	-	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.17	-	0.25
Lead Width	b	0.31	-	0.51
Mold Draft Angle Top	α	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°

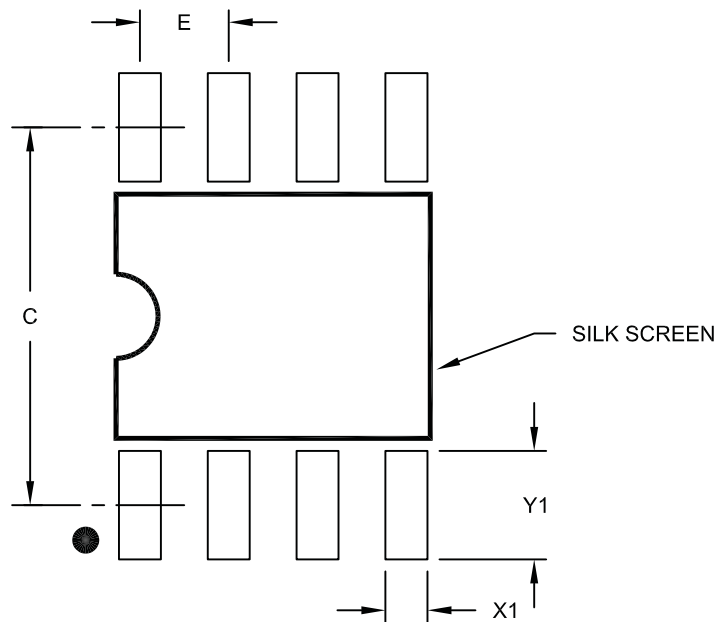
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M
 - BSC: Basic Dimension. Theoretically exact value shown without tolerances.
 - REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-057C Sheet 2 of 2

8-Lead Plastic Small Outline (OA) – Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



RECOMMENDED LAND PATTERN

Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

TC620/TC621

NOTES:

APPENDIX A: REVISION HISTORY

Revision E (February 2015)

1. Removed the -55°C to 125°C temperature range reference on page 1.
2. Removed the M version temperature range from page 3 (-55°C to 125°C).
3. Added the [Temperature Characteristics](#) table.
4. Added **Section 5.0 “Packaging Information”**.
5. Added the [Product Identification System](#) section.

Revision D (December 2012)

1. Added a note to each package outline drawing.

TC620/TC621

NOTES:

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

<u>PART NO.</u>	X	X	XX	XXX	X	Examples:
Device	Cooling/ Heating	Temperature Range	Package	Tape & Reel	PB Free	
Device:						
TC620:		5V, Dual Trip Point Temperature Sensors				a) TC620CCOA: 5V Dual Trip Point Temp sensor, Cooling option, 0°C to +70°C SOIC package
TC621:		5V, Dual Trip Point Temperature Sensors				b) TC620CEPA: 5V Dual Trip Point Temp sensor, Cooling option, -40°C to +85°C PDIP package.
Cooling/Heating Option:	C =	Cooling Option				c) TC620CVPA: 5V Dual Trip Point Temp sensor, Cooling option, -40°C to +125°C PDIP package.
	H =	Heating Option				d) TC620HCOA: 5V Dual Trip Point Temp sensor, Heating option, 0°C to +70°C SOIC package
Temperature Range:	C =	0°C to +70°C (PDIP and SOIC only)				e) TC621HEPA: 5V Dual Trip Point Temp sensor, Heating option, -40°C to +85°C PDIP package.
	E =	-40°C to +85°C				f) TC620CCOA713: 5V Dual Trip Point Temp sensor, Cooling option, 0°C to +70°C SOIC package.
	V =	-40°C to +125°C				g) TC621HCOA713: 5V Dual Trip Point Temp sensor, Heating option, 0°C to +70°C SOIC package.
Package:	OA =	Plastic SOIC, (150 mil Body), 8-lead				
	OA713 =	Plastic SOIC, (150 mil Body), 8-lead (Tape and Reel)				
	PA =	Plastic DIP (300 mil Body), 8-lead				

TC620/TC621

NOTES:

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, dsPIC, FlashFlex, flexPWR, JukeBlox, KEELOQ, KEELOQ logo, Klear, LANCheck, MediaLB, MOST, MOST logo, MPLAB, OptoLyzer, PIC, PICSTART, PIC³² logo, RightTouch, SpyNIC, SST, SST Logo, SuperFlash and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

The Embedded Control Solutions Company and mTouch are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, BodyCom, chipKIT, chipKIT logo, CodeGuard, dsPICDEM, dsPICDEM.net, ECAN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, KlearNet, KlearNet logo, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, RightTouch logo, REAL ICE, SQI, Serial Quad I/O, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademarks of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2001-2015, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

ISBN: 978-1-63277-119-3

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
== ISO/TS 16949 ==

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC[®] MCUs and dsPIC[®] DSCs, KEELOQ[®] code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.



MICROCHIP

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
<http://www.microchip.com/support>
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Austin, TX
Tel: 512-257-3370

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Cleveland
Independence, OH
Tel: 216-447-0464
Fax: 216-447-0643

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Novi, MI
Tel: 248-848-4000

Houston, TX
Tel: 281-894-5983
Indianapolis

Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

New York, NY
Tel: 631-435-6000

San Jose, CA
Tel: 408-735-9110

Canada - Toronto
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon

Hong Kong
Tel: 852-2943-5100
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8569-7000
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Chongqing
Tel: 86-23-8980-9588
Fax: 86-23-8980-9500

China - Dongguan
Tel: 86-769-8702-9880

China - Hangzhou
Tel: 86-571-8792-8115
Fax: 86-571-8792-8116

China - Hong Kong SAR
Tel: 852-2943-5100
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8864-2200
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

ASIA/PACIFIC

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4123

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-3019-1500

Japan - Osaka
Tel: 81-6-6152-7160
Fax: 81-6-6152-9310

Japan - Tokyo
Tel: 81-3-6880-3770
Fax: 81-3-6880-3771

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-5778-366
Fax: 886-3-5770-955

Taiwan - Kaohsiung
Tel: 886-7-213-7828

Taiwan - Taipei
Tel: 886-2-2508-8600
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Dusseldorf
Tel: 49-2129-3766400

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Germany - Pforzheim
Tel: 49-7231-424750

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Venice
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Poland - Warsaw
Tel: 48-22-3325737

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
Tel: 44-118-921-5800
Fax: 44-118-921-5820

01/27/15

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Board Mount Temperature Sensors](#) category:

Click to view products by [Microchip](#) manufacturer:

Other Similar products are found below :

[5962-8757102XA](#) [66F115](#) [EMC1063-1-ACZL-TR](#) [NCT218FCT2G](#) [O53GAB175A-160Y](#) [3610085020002](#) [389049M9527](#) [MIKROE-912](#)
[ADM1023ARQZ-REEL](#) [ADM1032ARMZ-1RL](#) [AT30TS74-U1FMBB-T](#) [AT30TS74-U1FMAB-T](#) [AT30TS74-U1FMCB-T](#) [AT30TS74-](#)
[U1FMDB-T](#) [ADT7483AARQZ-RL](#) [ADT7481ARMZ-REEL](#) [ADT7463ARQZ-REEL](#) [MCP98243T-BE/MC](#) [66L080-0226](#) [5962-8757103XA](#)
[S-58LM20A-I4T1U](#) [NCT375MNR2G](#) [LM84CIMQA](#) [CAT34TS00VP2GT4A](#) [NCT80DBR2G](#) [SEN-16304](#) [GX21M15](#) [GX122](#) [NST175H-](#)
[QSPR](#) [TC6501P065VCTTR](#) [AT-1U](#) [MCP9700AT-E/LT](#) [MCP9701-E/TO](#) [MCP9803-M/MS](#) [MCP9701A-E/TO](#) [LM57FEPWQ1](#) [LM57FPW](#)
[LM57FSPWQ1](#) [60-41123102-0150.0010](#) [60-43123102-0150.0010](#) [60-53123102-0150.0010](#) [MLX90615SSG-DAA-000-TU](#) [TMP303CDRLR](#)
[TC6501P055VCTTR](#) [TC6503P005VCTTR](#) [ADT7311WTRZ-RL](#) [ADT7311WTRZ-RL7](#) [ADT7461ARMZ-R7](#) [ADT7473ARQZ-REEL](#)
[LM335AM](#)