

General Description

The AQ200 is a simple three terminal precision low power thermostat. The temperature trip point of 120°C is preset at the factory. The thermal hysteresis is internally programmed to 10°C. **Contact sales@acutecchnology.com for other trip points.**

The AQ200 is used to protect systems from overheating above the normal rating of components like capacitors or any other temperature sensitive component.

The output OT is an open drain output that can drain up to 50mA when the threshold temperature is reached. The minimum voltage of operation is 2V.

The AQ200 is offered in the thermally enhanced PSOT23-6 in order to guarantee very low thermal impedance between the heat source and the chip itself.

For applications with stringent space requirements ultra small SC70 package is offered.

For applications where the thermal resistance is not critical the AQ200 can be used in the more common packages SOT23-3 or TO92.

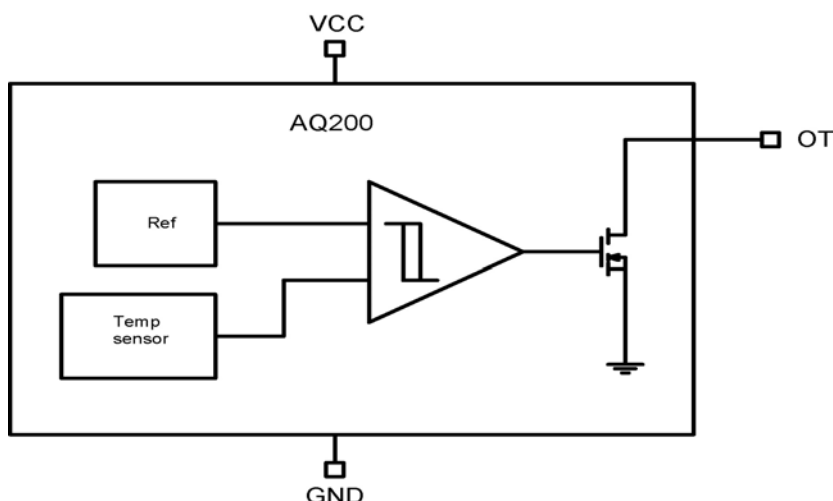
Applications

- Electronic System protection
- Fan Control
- Microprocessor Thermal Management
- HVAC Systems

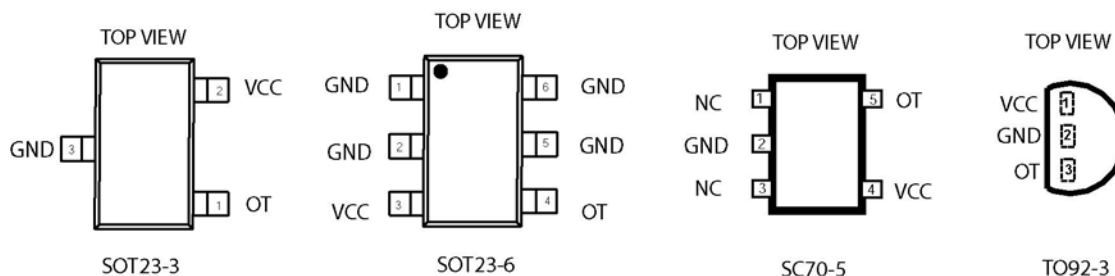
Features

- +/-3 degrees Celsius accuracy
- Thermally enhanced SOT23-6 package
- Open-drain output capable of 50mA
- Internally programmed thermal hysteresis
- Low input voltage and current
- Excellent power supply noise rejection
- Offered in ultra small SC70-5 package.
- RoHS compliant

Block Diagram



Pin Configuration



Pin Descriptions

Pin Name	Function
VCC	V supply. Must be greater than 2V for normal operation.
OT	Normally Open Drain, Vsat when thermal threshold is reached.
GND	Ground and Substrate, connected to the back side of the die through lead frame.

Ordering Information

Device	Operating Tj	TTHRESH	Tolerance	PKG Type	Wrap	Ordering Number
AQ200	-55° C ≤ 150° C	120° C	± 3° C	TO-92-3	Bulk	AQ200GY-N3-12-BUL
AQ200	-55° C ≤ 150° C	120° C	± 3° C	TO-92-3	T&R	AQ200GY-N3-12-TRL
AQ200	-55° C ≤ 150° C	120° C	± 3° C	SOT-23-3	T&R	AQ200GY-M3-12-TRL
AQ200	-55° C ≤ 150° C	120° C	± 3° C	PSOT-23-6	T&R	AQ200GY-M7-12-TRL
AQ200	-55° C ≤ 150° C	120° C	± 3° C	SC70-5	T&R	AQ200GY-C5-12-TRL

Note: The TRL parts are Lead Free and RoHS compliant.

Absolute Maximum Ratings

Stress greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These stress ratings only, and functional operation of the device at these or any conditions beyond those indicated under recommended Operating Conditions is not implied. Exposure to “Absolute Maximum Rating” for extended periods may affect device reliability. Use of standard ESD handling precautions is required.

Parameter	Value	Units
V _{IN} Voltage	18	V
V _{OT} Voltage	18	V
I _{OT} Current	80	mA
Operating Junction Temperature	155	°C
Lead Temperature (soldering 10 seconds)	260	°C
Storage Temperature Range	-65 to +150	°C

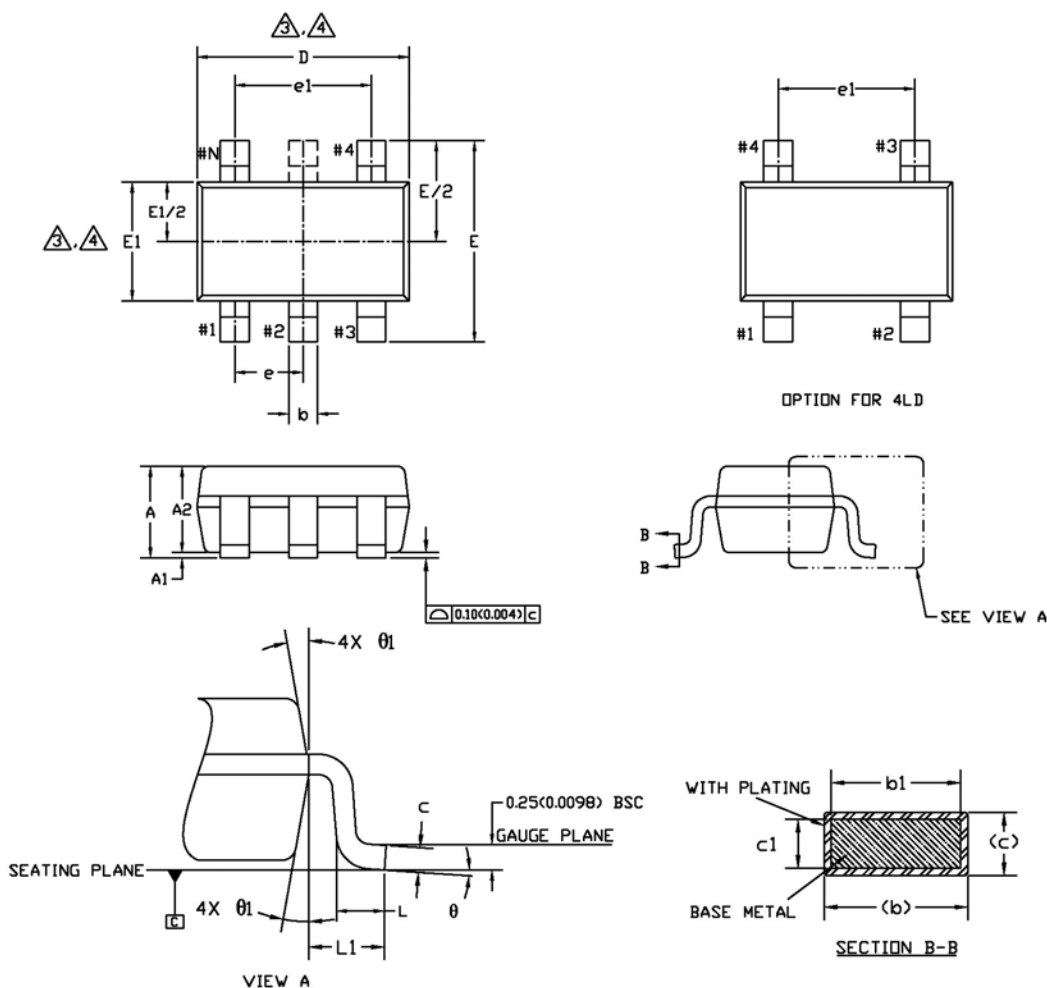
Electrical Specifications

Electrical characteristics are guaranteed over the full temperature range $-55^{\circ}\text{C} < T_j < 150^{\circ}\text{C}$ unless otherwise stated. Ambient temperature must be de-rated based upon power dissipation and package thermal characteristics. Unless otherwise specified: V_{in} = 5V, T_j = 25° C

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I _{IN}	Input Current			100	150	μA
I _{IN}	Input Current	T _j > trip temperature		1.5	2.0	mA
V _{IN}	Input Voltage	-55°C < T _j < 150°C	2		16	V
V _{OT}	Output V _{dss}	I _C = 10mA T _j < 155° C		0.15	0.25	V
I _{OT}	Output leakage current	V _C = 16V		0.2	0.4	μA
T _{OT}	Over temp accuracy		-3		3	° C
H _{OT}	Hysteresis			10		° C

Package Dimensions

SOT23-3, SOT23-4, SOT23-5, SOT23-6



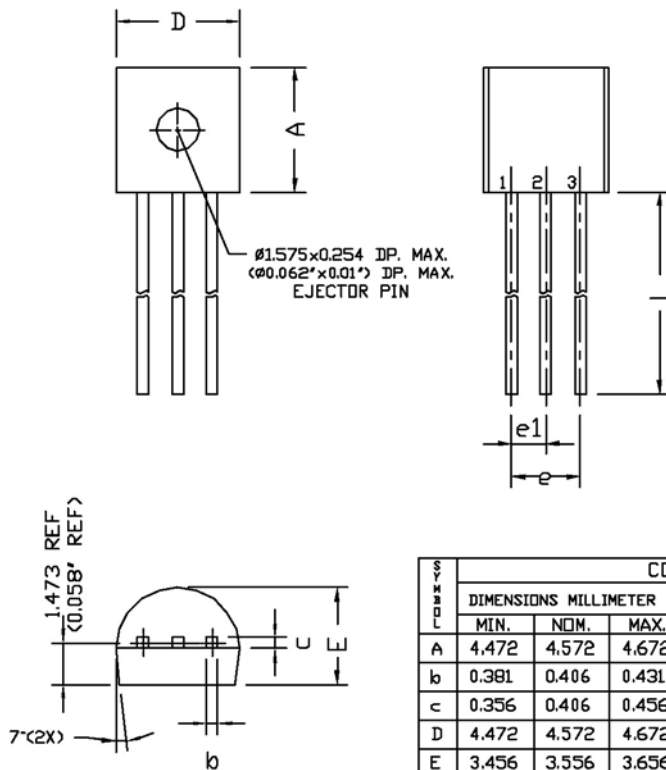
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.20	1.30	1.40	0.047	0.051	0.055
A1	0.05	-	0.15	0.002	-	0.006
A2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.35	-	0.50	0.013	-	0.020
b1	0.35	0.40	0.45	0.013	0.015	0.017
c	0.08	-	0.22	0.003	-	0.008
c1	0.08	0.13	0.20	0.003	0.005	0.007
D	2.90 BSC			0.114 BSC		
E	2.80 BSC			0.110 BSC		
E1	1.60 BSC			0.062 BSC		
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.074 BSC		
L	0.35	0.45	0.55	0.013	0.017	0.021
L1	0.60 REF.			0.023 REF.		
θ	0°	4°	8°	0°	4°	8°
θ1	10° TYP			10° TYP		

NOTE :

1. Dimensioning and tolerancing per ASME Y 14.5 M - 1994.
2. Dimensions are in millimeters. Converted inch dimension are not necessarily exact.
3. Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 0.15 mm per side. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.15 mm per side.
4. Top package may be smaller than the bottom package. Dimension D and E1 are determine at the outermost extremes of the plastic body exclusive of mold flash gate burrs and interlead flash.
5. Terminal numbers are shown for reference only. Die is facing up for molding. Die is facing down for trim/form.

Package Dimensions

TO92-2, TO92-3



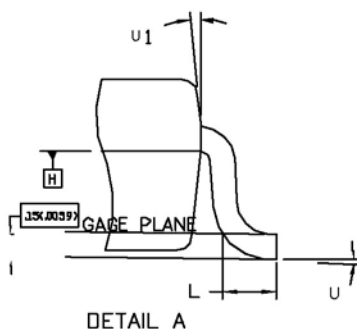
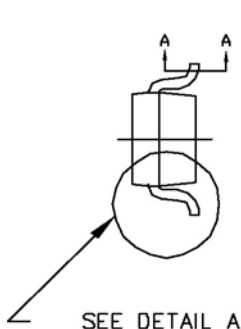
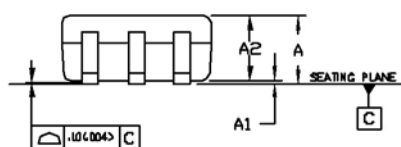
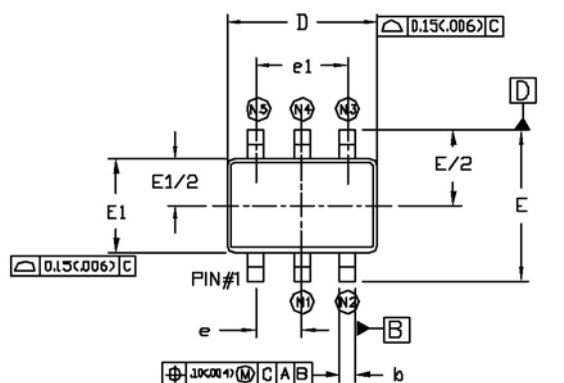
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	4.472	4.572	4.672	0.176	0.180	0.184
b	0.381	0.406	0.431	0.015	0.016	0.017
c	0.356	0.406	0.456	0.014	0.016	0.018
D	4.472	4.572	4.672	0.176	0.180	0.184
E	3.456	3.556	3.656	0.136	0.140	0.144
e	2.413	2.540	2.667	0.095	0.100	0.105
e1	1.143	1.270	1.397	0.045	0.050	0.055
L	13.87	13.97	14.07	0.546	0.550	0.554

NOTES :

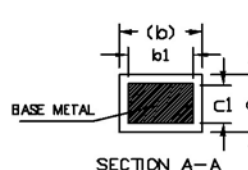
1. CONTROLLING DIMENSION : MILLIMETER. CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.
3. FOR 2 LEAD PACKAGE CENTER LEAD IS CLIPPED

Package Dimensions

SC70-3, SC70-4, SC70-5, SC70-6



SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	-	1.10	0.031	-	0.043
A1	0	-	0.10	0	-	0.004
A2	0.80	0.90	1.00	0.031	0.035	0.040
b	0.15	-	0.30	0.006	-	0.012
b1	0.15	0.20	0.25	0.006	0.008	0.010
c	0.08	-	0.25	0.003	-	0.010
c1	0.08	0.13	0.20	0.003	0.005	0.008
D	1.90	2.10	2.15	0.074	0.082	0.084
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.050	0.055
e	0.65 BSC			0.0255 BSC		
e1	1.30 BSC			0.0512 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
U	0°	-	8°	0°	-	8°
U1	4°	-	10°	4°	-	10°



PIN CODE	LEAD COUNT			
	3	4	5	6
N1	-	-	2	2
N2	2	2	3	3
N3	-	3	4	4
N4	3	-	-	5
N5	-	4	5	6

- NOTE :
1. CONTROLLING DIMENSION : MILLIMETER. CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.
 2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1994.
 3. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURR, MOLD FLASH, PROTRUSION OR GATE BURR SHALL NOT EXCEED 0.15MM(0.006") PER END. DIMENSION E1 DO NOT INCLUDE INTER-LEAD FLASH OR PROTRUSION, INTER-LEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.15MM (0.006") PER SIDE.
 4. THE PACKAGE TOP BE SMALLER THAN THE PACKAGE BOTTOM. DIMENSION D AND E1 ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY

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