

General Description

The AQ4041 is a precision voltage reference offered in very small packages SOT23 and SC70 for applications where power and space are critical. Its precision reference is trimmed during wafer sort to insure accuracy and tight distributions centered at 1.225V. The minimum operating current is less than 40 μ A to keep power consumption at a minimum. The bandgap reference has curvature correction and low dynamic impedance to ensure stable accuracy over a wide range of operating currents and temperatures

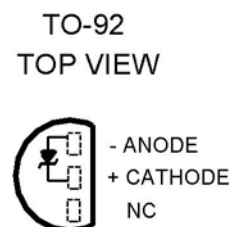
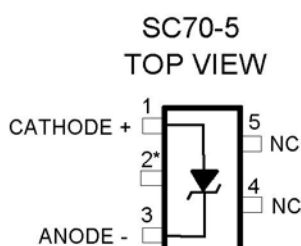
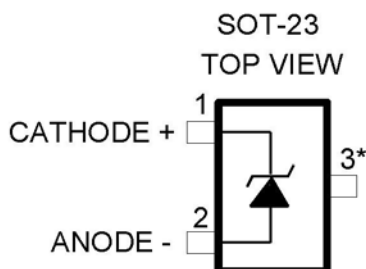
Applications

- Power supplies
- Low TC low voltage reference
- Portable, Battery-Powered Equipment
- Instrumentation

Features

- Offered in small packages: SOT23 and SC70
- 40 μ A to 12mA operation
- Low TC voltage reference 100ppm/ $^{\circ}$ C
- Stable with no load capacitance
- **RoHS compliant**

Pin Configuration



*This pin must be left unconnected or connected to pin 2

Pin Descriptions

Pin Name	Function
CATH	+ Input, nominally 1.225V in normal operation.
Anode	- Ground
NC	This pin must be left floating or connect to Anode

Ordering Information

Device	Operating Tj	%Tol	PKG Type	VOUT	Wrap	Ordering Number
AQ4041	-40°C ≤ 85°C	0.5	SOT-23-3	1.225V	T&R	AQ4041EZ-M3-12-TRL
AQ4041	-40°C ≤ 85°C	1.0	SOT-23-3	1.225V	T&R	AQ4041EY-M3-12-TRL
AQ4041	-40°C ≤ 85°C	0.5	SC70-5	1.225V	T&R	AQ4041EZ-C5-12-TRL
AQ4041	-40°C ≤ 85°C	1.0	SC70-5	1.225V	T&R	AQ4041EY-C5-12-TRL
AQ4041	-40°C ≤ 85°C	0.5	TO92-3	1.225V	T&R	AQ4041EZ-N3-12-TRL
AQ4041	-40°C ≤ 85°C	1.0	TO92-3	1.225V	T&R	AQ4041EY-N3-12-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.

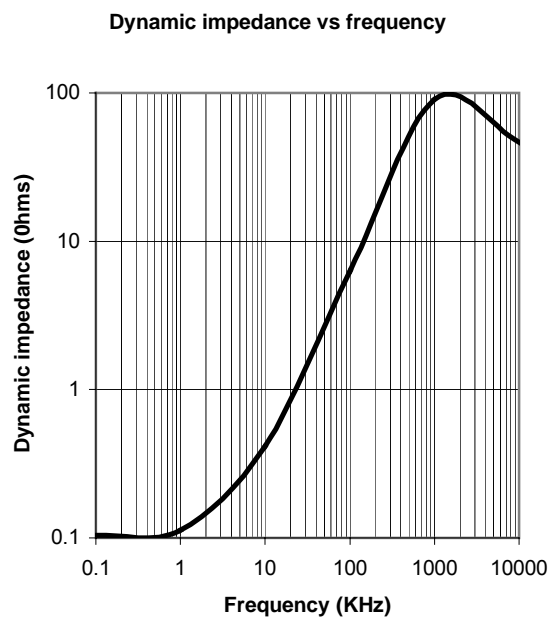
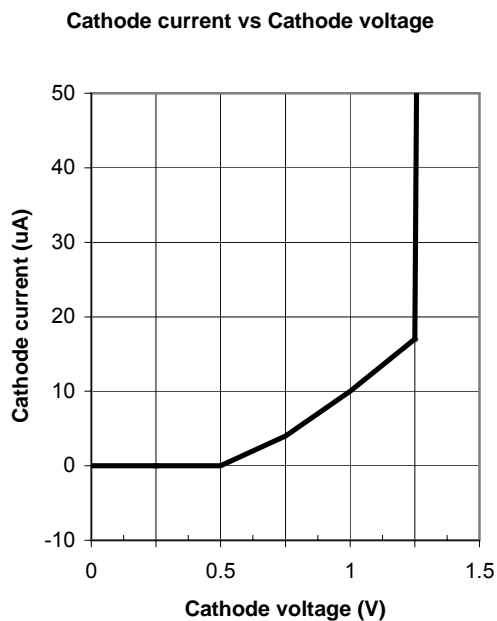
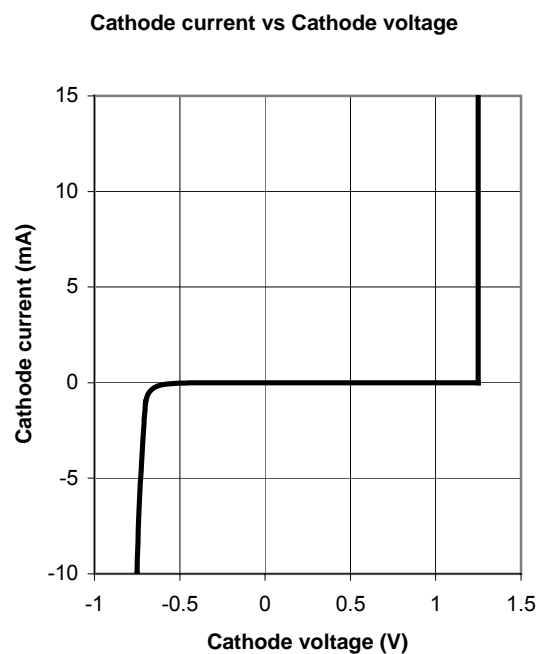
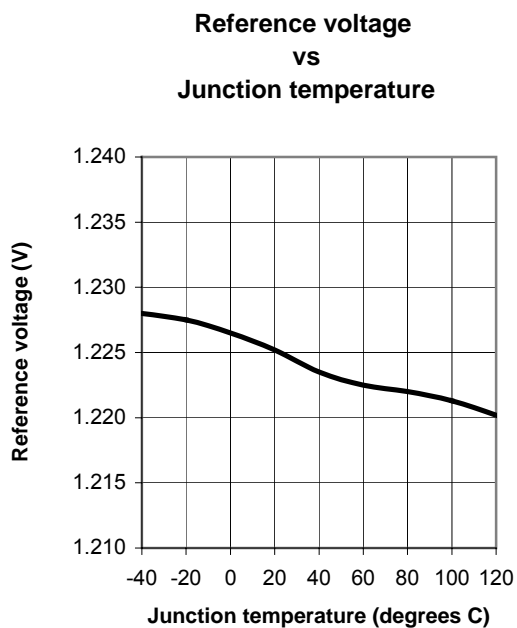
Parameter	Value	Units
ANODE Forward Current	+50	mA
ANODE Reverse Current	-50	mA
Operating Junction Temperature	150	°C
Lead Temperature (soldering 10 seconds)	260	°C
Storage Temperature Range	-65 to +150	°C
ESD (Human Body Model)	2	KV

Electrical Specifications

Electrical characteristics are guaranteed at 25°C unless otherwise stated. Ambient temperature must be de-rated based upon power dissipation and package thermal characteristics.

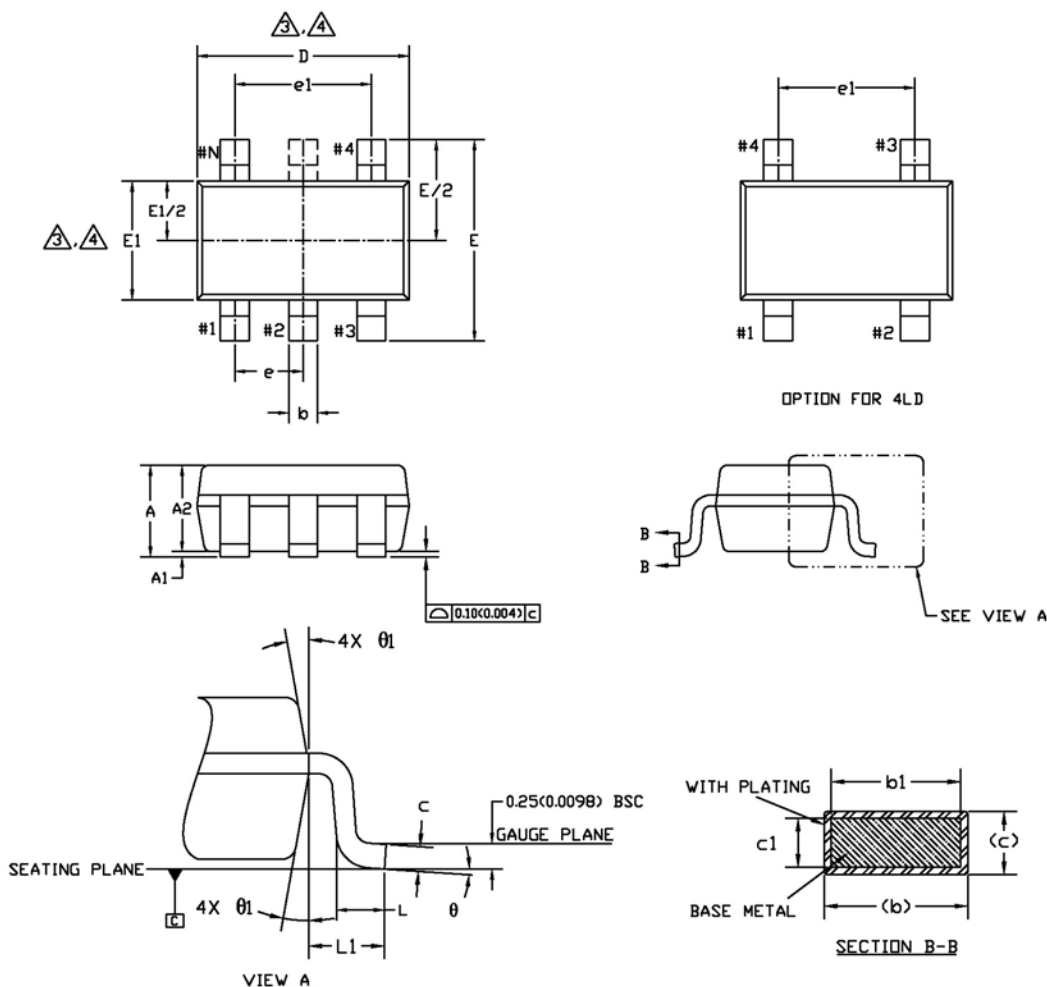
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _R	Reverse Breakdown Voltage	I _R = 100μA 0.5% option -40°C < T _j < 85°C	1.219	1.225	1.231	V
			1.211		1.239	V
V _R	Reverse Breakdown Voltage	I _R = 100μA 1.0% option -40°C < T _j < 85°C	1.213	1.225	1.237	V
			1.201		1.249	V
ΔV _R	V _R Temperature deviation	-40°C < T _j < 85°C.		50	100	ppm/°C
I _{R(min)}	Minimum Operating Current			18	40	μA
ΔV _R /ΔI _R	V _R deviation with I _R	I _{R(min)} ≤ I _R ≤ 12 mA		2	6	mV
		-40°C < T _j < 85°C		2	8	mV
Z _R	Dynamic Output Impedance	I _R = 1mA, I _{AC} = 0.1 I _R , f = 120Hz		0.1	1.5	Ω
θ _N	Wideband Noise	I _R = 1mA, 10Hz ≤ f ≤ 10 kHz		20		μV _{rms}
ΔV _R	Long term stability	T = 1000 hrs, T = 25°C, I _R = 100μA		120		ppm

Typical performance curves



Package Dimensions

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



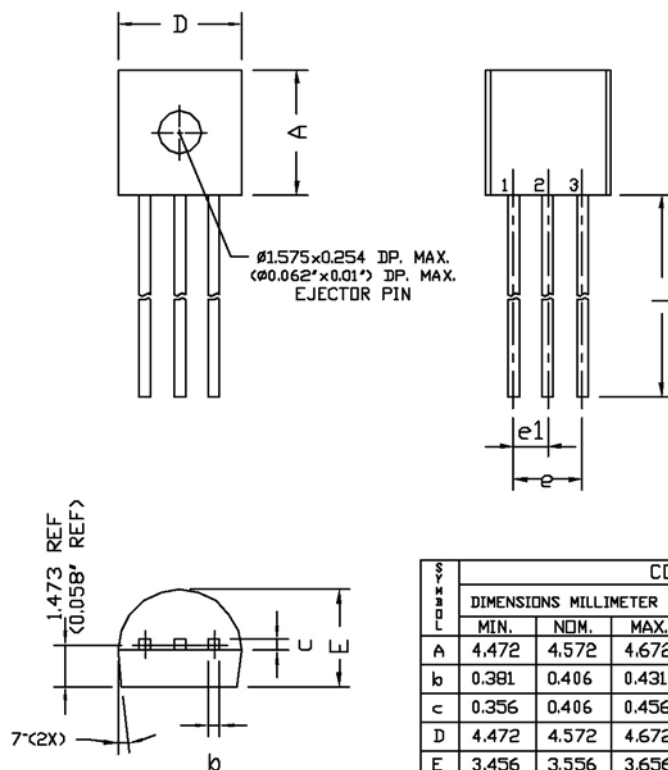
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.20	1.30	1.40	0.047	0.051	0.055
A1	0.05	-	0.15	0.002	-	0.006
A2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.35	-	0.50	0.013	-	0.020
b1	0.35	0.40	0.45	0.013	0.015	0.017
c	0.08	-	0.22	0.003	-	0.008
c1	0.08	0.13	0.20	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.		
Ø	0°	4°	8°	0°	4°	8°
Ø1	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 determined 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



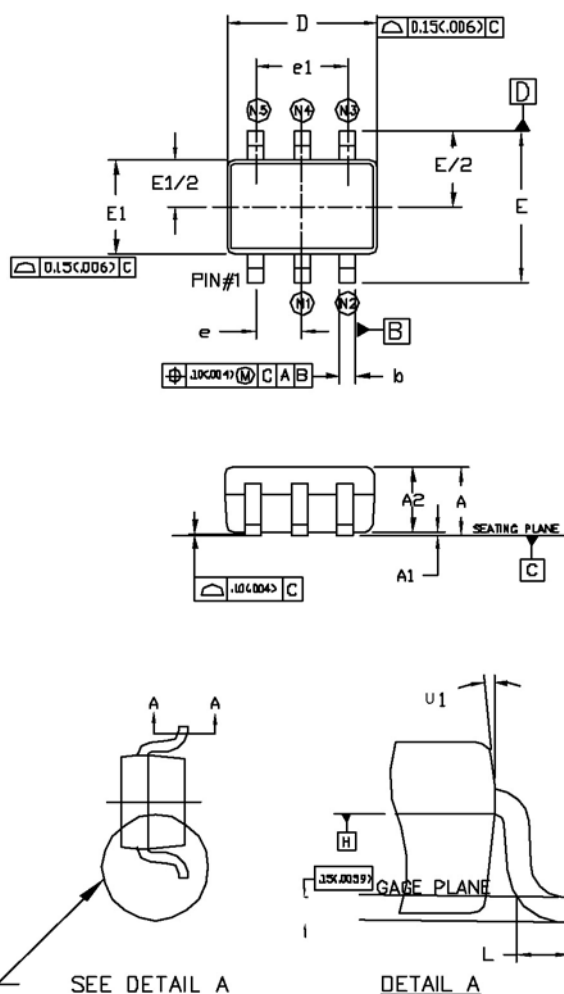
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	4.472	4.572	4.672	0.176	0.180	0.184
b	0.381	0.406	0.431	0.015	0.016	0.017
c	0.356	0.406	0.456	0.014	0.016	0.018
D	4.472	4.572	4.672	0.176	0.180	0.184
E	3.456	3.556	3.656	0.136	0.140	0.144
e	2.413	2.540	2.667	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

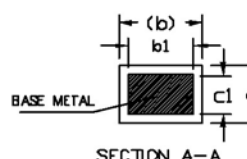
SC70-3, SC70-4, SC70-5, SC70-6



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

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	3	4	5	6
N1	-	-	2	2
N2	2	2	3	3
N3	-	3	4	4
N4	3	-	-	5
N5	-	4	5	6

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