LDS4041P

Precision Micropower Shunt Voltage Reference

SOT23 and TO92 Package

Product Specification | Revision 1.2 | February 08, 2008

General Description

The LDS4041P is a precision voltage reference offered in the very small SOT23 package 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 µA 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

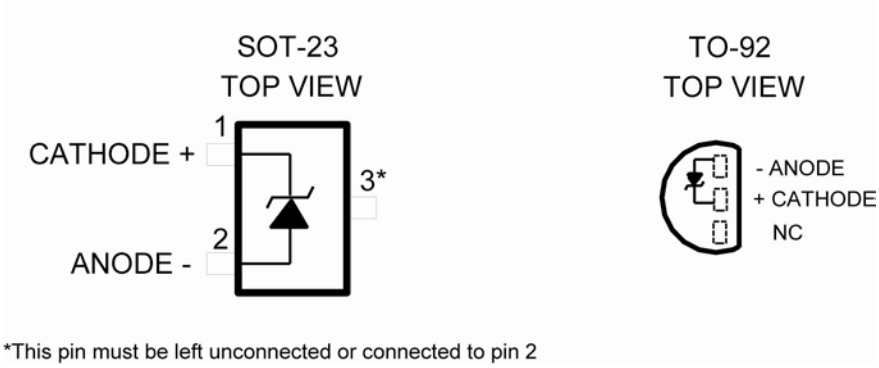
Applications

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

Features

- Offered in small SOT23-3 package
- 40uA to 12mA operation
- Low TC voltage reference 100ppm/°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

Absolute Maximum Ratings

Stress greater than 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 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	ºC
Lead Temperature (soldering 10 seconds)	260	ºC
Storage Temperature Range	-65 to +150	ºC
ESD (Human Body Model)	2	KV

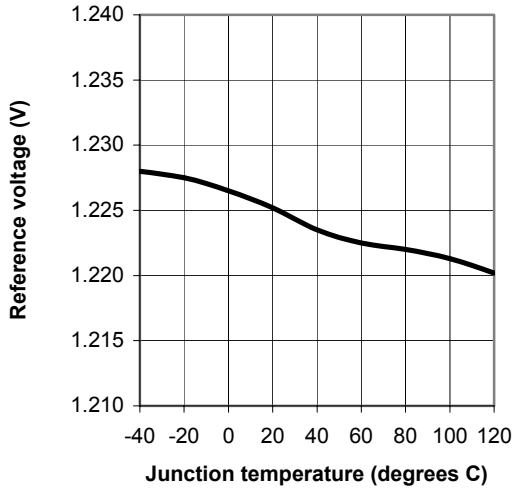
Electrical Specifications

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

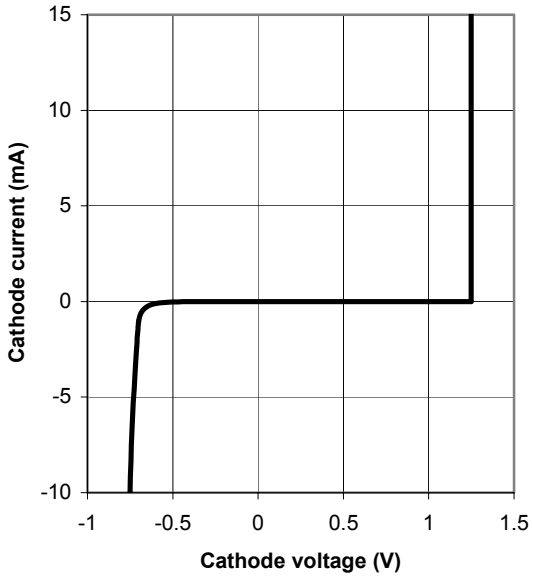
Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_R	Reverse Breakdown Voltage	I_R =100µA	0.5% option	1.219	1.225	1.231	V
			–40ºC <Tj<85ºC	**1.211**		**1.239**	V
V_R	Reverse Breakdown Voltage	I_R =100µA	1.0% option	1.213	1.225	1.237	V
			–40ºC <Tj<85ºC	**1.201**		**1.249**	V
ΔV_R	V_R Temperature deviation	–40ºC <Tj<85ºC.			**50**	**100**	ppm/ºC
$I_{R(min)}$	Minimum Operating Current				18	40	µA
$\Delta V_R / \Delta I_R$	V_R deviation with I_R	$I_{R(min)} \leq I_R \leq$ 12 mA			2	6	mV
		–40ºC <Tj<85ºC			**2**	**8**	mV
ZR	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 $\leq$ f $\leq$ 10 kHz			20		µV $_{rms}$
ΔV_R	Long term stability	T =1000 hrs, T =25ºC, IR =100µA			120		ppm

Typical performance curves

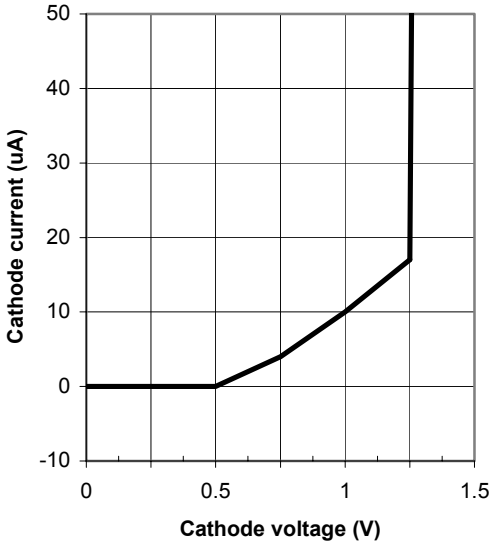
Reference voltage vs Junction temperature



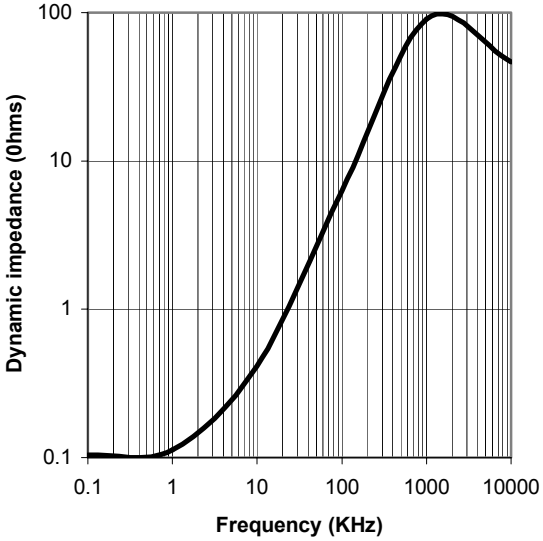
Cathode current vs Cathode voltage



Cathode current vs Cathode voltage

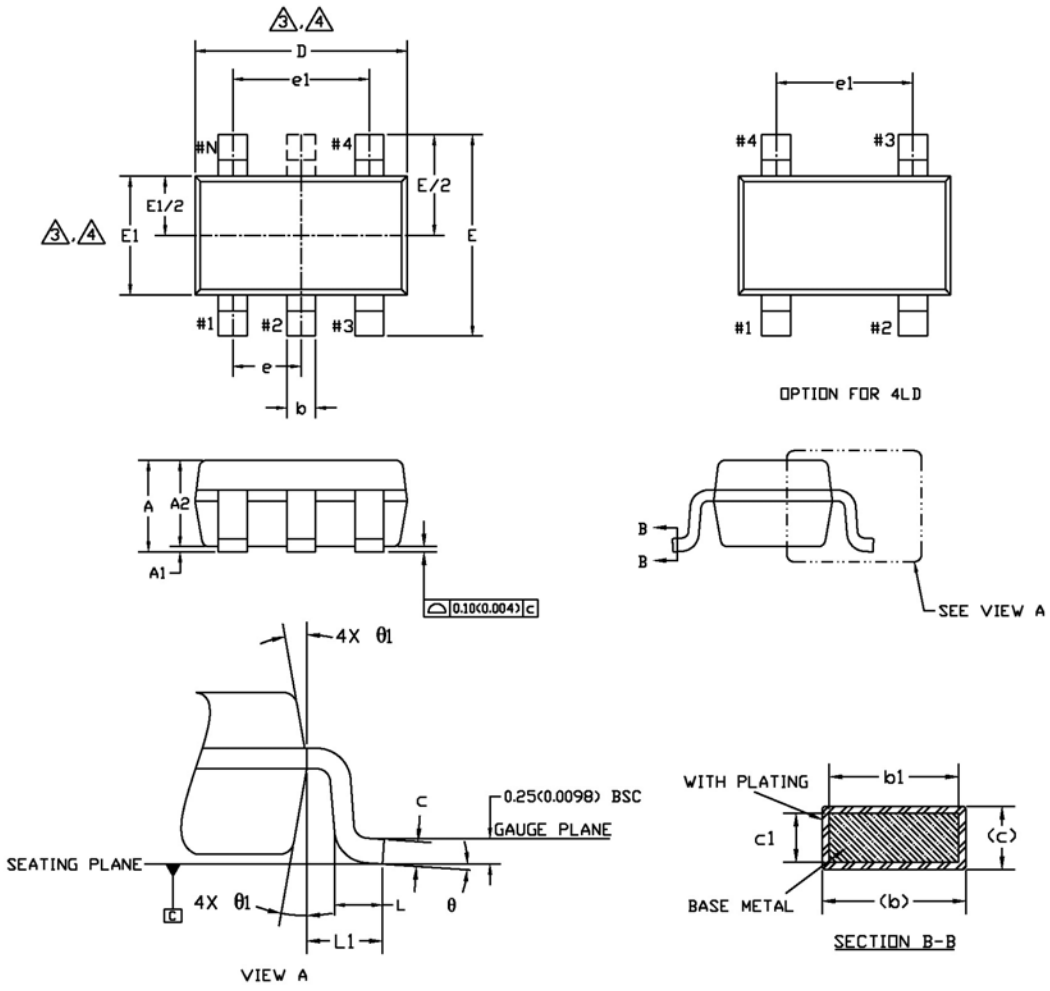


Dynamic impedance vs frequency



Package Dimensions

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



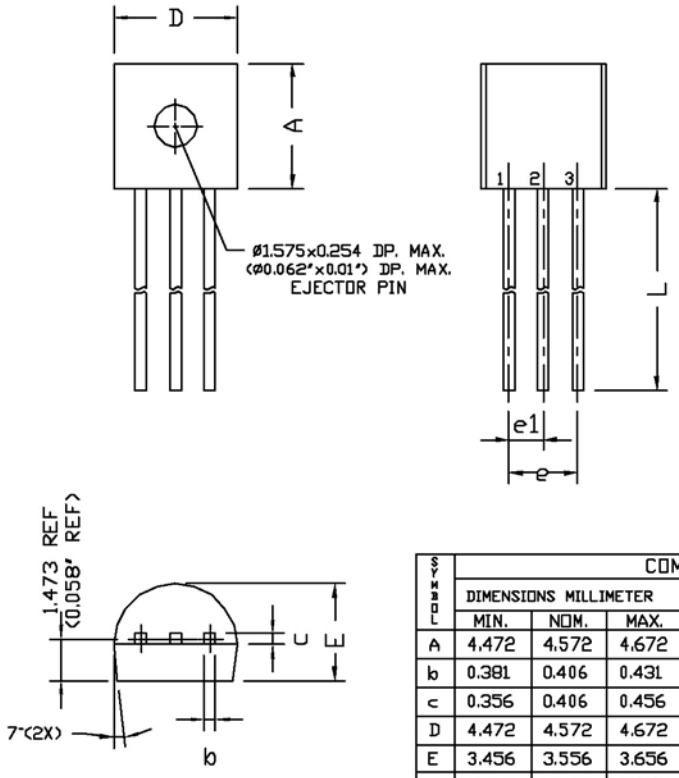
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.20	1.30	1.40	0.047	0.051	0.055
A1	0.05	-	0.15	0.002	-	0.006
A2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.35	-	0.50	0.013	-	0.020
b1	0.35	0.40	0.45	0.013	0.015	0.017
c	0.08	-	0.22	0.003	-	0.008
c1	0.08	0.13	0.20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

Ordering Information

Device	Operating Tj	%Tol	PKG Type	VOUT	Wrap	Ordering Number
LDS4041P	-40C° ≤ 85C°	0.5	SOT-23-3	1.225V	T&R	LDS4041EZ-M3-12-TL
LDS4041P	-40C° ≤ 85C°	1.0	SOT-23-3	1.225V	T&R	LDS4041EY-M3-12-TL
LDS4041P	-40C° ≤ 85C°	0.5	TO92-3	1.225V	T&R	LDS4041EZ-N3-12-TL
LDS4041P	-40C° ≤ 85C°	1.0	TO92-3	1.225V	T&R	LDS4041EY-N3-12-TL

Note: Lead Free and RoHS compliant.

Leadis Technology
800 W. California Ave,
Suite 200
Sunnyvale, CA 94086
Phone: 408.331.8600
Fax: 408.331.8601
http://www.leadis.com

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