

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Add lead finish E device. Make clarification to the ordering quantity column as specified under paragraph 6.3 - ro	18-03-02	C. SAFFLE



Prepared in accordance with ASME Y14.24

Vendor item drawing

REV																				
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REV STATUS OF PAGES	REV	A	A	A	A	A	A	A	A											
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PMIC N/A	PREPARED BY Phu H. Nguyen	DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 http://www.dla.mil/landandmaritime
Original date of drawing YY-MM-DD 12-10-09	CHECKED BY Phu H. Nguyen	TITLE MICROCIRCUIT, LINEAR, LOW NOISE, MICROPOWER 5.0 V PRECISION VOLTAGE REFERENCE, MONOLITHIC SILICON
	APPROVED BY Thomas M. Hess	
	SIZE A	CODE IDENT. NO. 16236
	REV A	DWG NO. V62/12641
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DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance low noise, micropower 5.0 V precision voltage reference microcircuit, with an operating temperature range of -55°C to +125°C.

1.2 Vendor Item Drawing Administrative Control Number. The manufacturer's PIN is the item of identification. The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation:

<u>V62/12641</u> Drawing number	-	<u>01</u> Device type (See 1.2.1)	<u>X</u> Case outline (See 1.2.2)	<u>B</u> Lead finish (See 1.2.3)
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1.2.1 Device type(s).

<u>Device type</u>	<u>Generic</u>	<u>Circuit function</u>
01	ADR293-EP	Low noise, micropower 5.0 V precision voltage reference

1.2.2 Case outline(s). The case outline(s) are as specified herein.

<u>Outline letter</u>	<u>Number of pins</u>	<u>JEDEC PUB 95</u>	<u>Package style</u>
X	8	JEDEC MO-153-AA	Thin shrink small outline package

1.2.3 Lead finishes. The lead finishes are as specified below or other lead finishes as provided by the device manufacturer:

<u>Finish designator</u>	<u>Material</u>
A	Hot solder dip
B	Tin-lead plate
C	Gold plate
D	Palladium
E	Gold flash palladium
F	Tin-lead alloy (BGA/CGA)
Z	Other

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1.3 Absolute maximum ratings. 1/

Supply voltage	18.0 V
Output short circuit duration to GND	Indefinite
Operating temperature range:	-55°C to +125°C
Storage temperature range	-65°C to +150°C
Junction temperature range	-65°C to +150°C
Lead temperature (soldering, 60 seconds)	300°C

1.4 Thermal characteristics.

Thermal resistance

Case outline	θ_{JA}	θ_{JC}	Unit
Case X	240	43	°C/W

2. APPLICABLE DOCUMENTS

JEDEC Solid State Technology Association

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Applications for copies should be addressed to the JEDEC – Solid State Technology Association, 3103 North 10th Street, Suite 240–S, Arlington, VA 22201-2107.or online at <https://www.jedec.org>).

3. REQUIREMENTS

3.1 Marking. Parts shall be permanently and legibly marked with the manufacturer’s part number as shown in 6.3 herein and as follows:

- A. Manufacturer’s name, CAGE code, or logo
- B. Pin 1 identifier
- C. ESDS identification (optional)

3.2 Unit container. The unit container shall be marked with the manufacturer’s part number and with items A and C (if applicable) above.

3.3 Electrical characteristics. The maximum and recommended operating conditions and electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.4 Design, construction, and physical dimension. The design, construction, and physical dimensions are as specified herein.

3.5 Diagrams.

3.5.1 Case outline. The case outline shall be as shown in 1.2.2 and figure 1.

3.5.2 Terminal connections. The terminal connections shall be as shown in figure 2.

1/ Stresses beyond those listed under “absolute maximum rating” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

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TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Test conditions VS = 6.0 V, TA =25°C unless otherwise specified	Limits			Unit
			Min	Typ	Max	
Output voltage (T Grade)	VOUT	IOUT = 0 mA	4.990	5.000	5.010	V
Initial accuracy (T Grade)		IOUT = 0 mA	-10		+10 0.20	mV %
Line regulation (T Grade)	$\Delta V_{OUT}/\Delta V_{IN}$	6.0 V to 15 V, IOUT = 0 mA		40	150	ppm/V
Load regulation (T Grade)	$\Delta V_{OUT}/\Delta I_{LOAD}$	VS = 6.0 V, IOUT = 0 mA to 5 mA		30	150	ppm/mA
Long term stability	ΔV_{OUT}	After 1000 hours of operation at 125°C		50		ppm
Voltage noise	eN p-p	f = 0.1 Hz to 10 Hz		15		μV p-p
Voltage noise density	eN	f = 1 kHz		640		nV/ \sqrt{Hz}

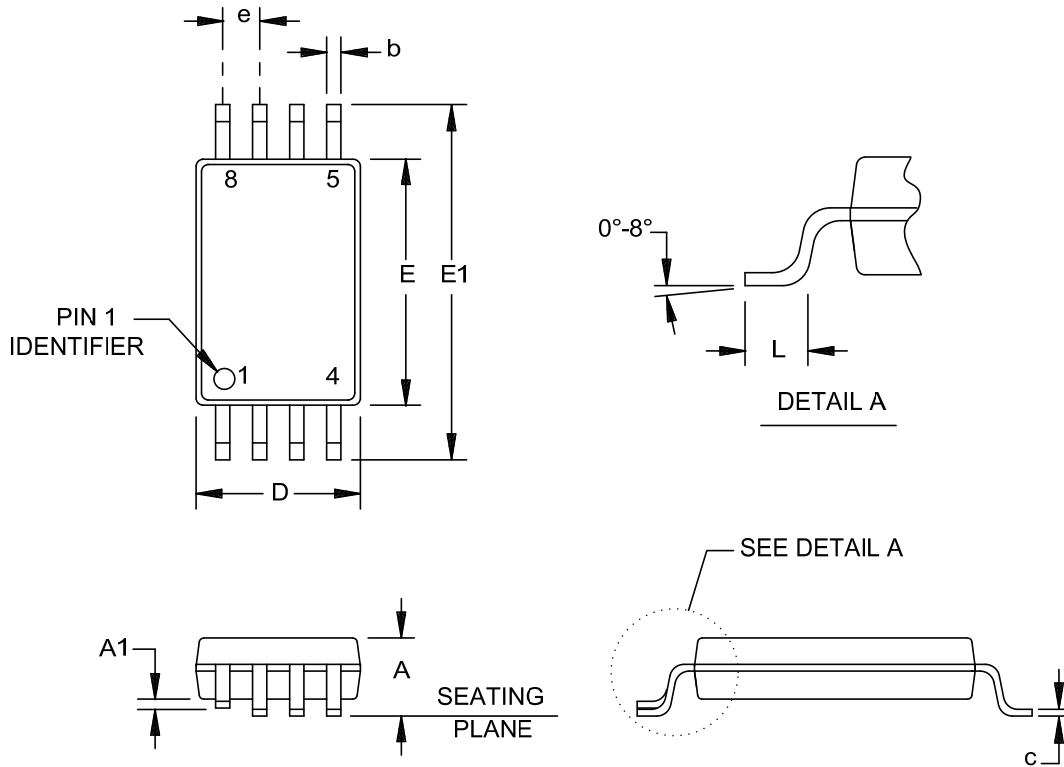
Test	Symbol	Test conditions VS = 6.0 V -25°C ≤ TA ≤ +85°C unless otherwise specified	Limits			Unit
			Min	Typ	Max	
Temperature coefficient (T Grade)	TCVOUT	IOUT = 0 mA		10	25	ppm/°C
Line regulation (T Grade)	$\Delta V_{OUT}/\Delta V_{IN}$	6.0 V to 15 V, IOUT = 0 mA		50	200	ppm/V
Load regulation (T Grade)	$\Delta V_{OUT}/\Delta I_{LOAD}$	VS = 6.0 V, IOUT = 0 mA to 5 mA		30	200	ppm/mA

Test	Symbol	Test conditions VS = 6.0 V -55°C ≤ TA ≤ +125°C unless otherwise specified	Limits			Unit
			Min	Typ	Max	
Temperature coefficient (T Grade)	TCVOUT	IOUT = 0 mA		10	30	ppm/°C
Line regulation (T Grade)	$\Delta V_{OUT}/\Delta V_{IN}$	6.0 V to 15 V, IOUT = 0 mA		70	250	ppm/V
Load regulation (T Grade)	$\Delta V_{OUT}/\Delta I_{LOAD}$	VS = 6.0 V, IOUT = 0 mA to 5 mA		30	300	ppm/mA
Supply current	IS	At 25°C		11 15	15 20	μA
Thermal hysteresis (T Grade)	VOUT-HYS			157		ppm

1/ Testing and other quality control techniques are used to the extent deemed necessary to assure product performance over the specified temperature range. Product may not necessarily be tested across the full temperature range and all parameters may not necessarily be tested. In the absence of specific parametric testing, product performance is assured by characterization and/or design.

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Case X



Dimensions					
Symbol	Millimeters		Symbol	Millimeters	
	Min	Max		Min	Max
A		1.20	E	4.30	4.50
A1	0.05	0.15	E1	6.40 BSC	
b	0.19	0.30	e	0.65 BSC	
c	0.09	0.20	L	0.45	0.75
D	2.90	3.10			

NOTES:

1. All linear dimensions are in millimeters.
2. Falls within JEDEC MO-153-AA.

FIGURE 1. Case outline.

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Device type	01
Case outline	X
Terminal number	Terminal symbol
1	NC
2	VIN
3	NC
4	GND
5	NC
6	VOUT
7	NC
8	NC

FIGURE 2. Terminal connections.

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4. VERIFICATION

4.1 Product assurance requirements. The manufacturer is responsible for performing all inspection and test requirements as indicated in their internal documentation. Such procedures should include proper handling of electrostatic sensitive devices, classification, packaging, and labeling of moisture sensitive devices, as applicable.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Preservation, packaging, labeling, and marking shall be in accordance with the manufacturer's standard commercial practices for electrostatic discharge sensitive devices.

6. NOTES

6.1 ESDS. Devices are electrostatic discharge sensitive and are classified as ESDS class 1 minimum.

6.2 Configuration control. The data contained herein is based on the salient characteristics of the device manufacturer's data book. The device manufacturer reserves the right to make changes without notice. This drawing will be modified as changes are provided.

6.3 Suggested source(s) of supply. Identification of the suggested source(s) of supply herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item. DLA Land and Maritime maintains an online database of all current sources of supply at <https://landandmaritimeapps.dla.mil/programs/smcr/>.

Vendor item drawing administrative control number <u>1/</u>	Device manufacturer CAGE code	Mode of transportation and quantity	Vendor part number
V62/12641-01XB	24355	Tube, 96 units	ADR293TRU-EP
		Reel, 1000 units	ADR293TRU-EP-R7
V62/12641-01XE	24355	Tube, 96 units	ADR293TRUZ-EP

1/ The vendor item drawing establishes an administrative control number for identifying the item on the engineering documentation.

CAGE code

24355

Source of supply

Analog Devices
 Route 1 Industrial Park
 P.O. Box 9106
 Norwood, MA 02062
 Point of contact: Raheen Business Park
 Limerick, Ireland

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