

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add device types 02 and 03. - ro	12-10-31	C. SAFFLE
B	Update document paragraphs to current requirements. - ro	17-08-29	C. SAFFLE
C	Delete paragraph 1.5 and add theta JC and theta JA limits into paragraph 1.3. Under Table I, add typical limits to V_{OUT} , TC_{VO} , $\Delta V_O / \Delta V_{IN}$, and I_{IN} tests parameters. Under paragraph 6.3, add unit quantities. Update document to current requirements. - ro	24-05-23	J. ESCHMEYER



Prepared in accordance with ASME Y14.24

Vendor Item Drawing

Revision Status of Sheets

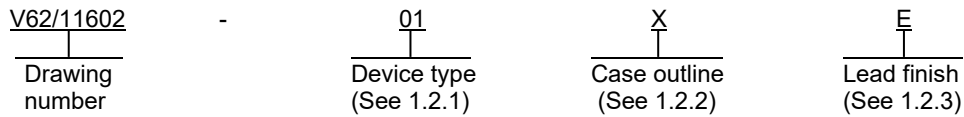
REV																				
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REV	C	C	C	C	C	C	C	C	C	C										
SHEET	1	2	3	4	5	6	7	8	9	10										

PMIC N/A Original date of drawing YY-MM-DD 10-12-07	PREPARED BY RICK OFFICER		DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 https://www.dla.mil/landandmaritime	
	CHECKED BY RAJESH PITHDIA		TITLE MICROCIRCUIT, LINEAR, LOW NOISE, VOLTAGE REFERENCE, MONOLITHIC SILICON	
	APPROVED BY CHARLES F. SAFFLE		DWG NO. V62/11602	
	SIZE A	CAGE CODE 16236	PAGE 1 OF 10	
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1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance low noise 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:



1.2.1 Device type(s).

<u>Device type</u>	<u>Generic</u>	<u>Circuit function</u>
01	ADR434-EP	Low noise voltage reference
02	ADR435-EP	Low noise voltage reference
03	ADR431-EP	Low noise 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	MS-012-AA	Plastic small outline

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 (VIN)	20 V
Output short circuit duration	Indefinite
Differential input voltage	+Vs and -Vs
Power dissipation (PD)	14.4 mW
Storage temperature range (TSTG)	-65°C to +125°C
Junction temperature range (TJ)	-65°C to +150°C
Lead temperature range (soldering, 60 seconds)	+300°C
Thermal resistance, junction to ambient (θJC)	43°C/W
Thermal resistance, junction to ambient (θJA)	130°C/W

1.4 Recommended operating conditions. 2/

Input voltage range (VIN) :	
Device type 01	6.1 V to 18 V
Device type 02	7.0 V to 18 V
Device type 03	4.5 V to 18 V
Operating temperature range (TA)	-55°C to +125°C

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.

2/ Use of this product beyond the manufacturers design rules or stated parameters is done at the user’s risk. The manufacturer and/or distributor maintain no responsibility or liability for product used beyond the stated limits.

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2. APPLICABLE DOCUMENTS

JEDEC Solid State Technology Association

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Copies of these documents are available 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.

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TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions <u>2/</u> I _L = 0 mA, unless otherwise specified	Temperature, T _A	Device type	Limits		Unit				
					Min	Max					
Output voltage	V _{OUT}		+25°C	01	4.0945	4.0975	V				
					4.096 typical						
				02	4.998	5.002					
					5.000 typical						
				03	2.499	2.501					
					2.500 typical						
Initial accuracy	V _{OERR}		+25°C	01		±1.5	mV				
						±0.04	%				
				02		±2.0	mV				
						±0.04	%				
				03		±1.0	mV				
						±0.04	%				
				Temperature coefficient	TC _{VO}		-55°C to +125°C	01, 02		3	ppm/ °C
									1 typical		
03		5									
	1.5 typical										
Line regulation	$\Delta V_O / \Delta V_{IN}$	V _{IN} = 6.1 V to 18 V	-55°C to +125°C	01		20	ppm/V				
		5 typical									
		V _{IN} = 7.0 V to 18 V		02		20					
		5 typical									
		V _{IN} = 4.5 V to 18 V		03		20					
		5 typical									
Load regulation	$\Delta V_O / \Delta I_L$	I _L = 0 mA to 10 mA, V _{IN} = 7 V	-55°C to +125°C	01		15	ppm/ mA				
		15									
		I _L = -10 mA to 0 mA, V _{IN} = 7 V		02		15					
		15									
		I _L = 0 mA to 10 mA, V _{IN} = 8 V		03		15					
		15									
		I _L = -10 mA to 0 mA, V _{IN} = 8 V		03		15					
		15									
I _L = 0 mA to 10 mA, V _{IN} = 5 V	03		15								
15											
I _L = -10 mA to 0 mA, V _{IN} = 5 V	03		15								
15											

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued. 1/

Test	Symbol	Conditions <u>2/</u> I _L = 0 mA, unless otherwise specified	Temperature, T _A	Device type	Limits		Unit
					Min	Max	
Quiescent current	I _{IN}	No load	-55°C to +125°C	01		800	μA
					595 typical		
				02		800	
					620 typical		
				03		800	
580 typical							
Voltage noise	e _{nP-P}	0.1 Hz to 10.0 Hz	+25°C	01	6.25 typical		μV _{P-P}
				02	8 typical		
				03	3.5 typical		
Voltage noise density	e _N	1 kHz	+25°C	01	100 typical		nV / √Hz
				02	115 typical		
				03	80 typical		
Turn on settling time	t _R	C _L = 0 μF	+25°C	01, 02, 03	10 typical		μs
Long term stability <u>3/</u>	ΔV _O	1,000 hours	+25°C	01, 02, 03	40 typical		ppm
Output voltage hysteresis	V _{O_HYS}		+25°C	01, 02, 03	20 typical		ppm
Ripple rejection ratio	RRR	f _{IN} = 1 kHz	+25°C	01, 02, 03	-70 typical		dB
Short circuit to GND	I _{SC}		+25°C	01, 02, 03	40 typical		mA
Supply voltage operating range	V _{IN}		+25°C	01	6.1	18	V
				02	7.0	18	
				03	4.5	18	
Supply voltage headroom	V _{IN} - V _O		+25°C	01, 02, 03	2		V

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.

2/ Unless otherwise specified, T_A = +25°C, for device type 01, V_{IN} = 6.1 V to 18 V, for device type 02, V_{IN} = 7.0 V to 18 V, and for device type 03, V_{IN} = 4.5 V to 18 V.

3/ The long term stability specification is noncumulative. The drift in subsequent 1,000 hour periods is significantly lower than in the first 1,000 hour period.

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Case X

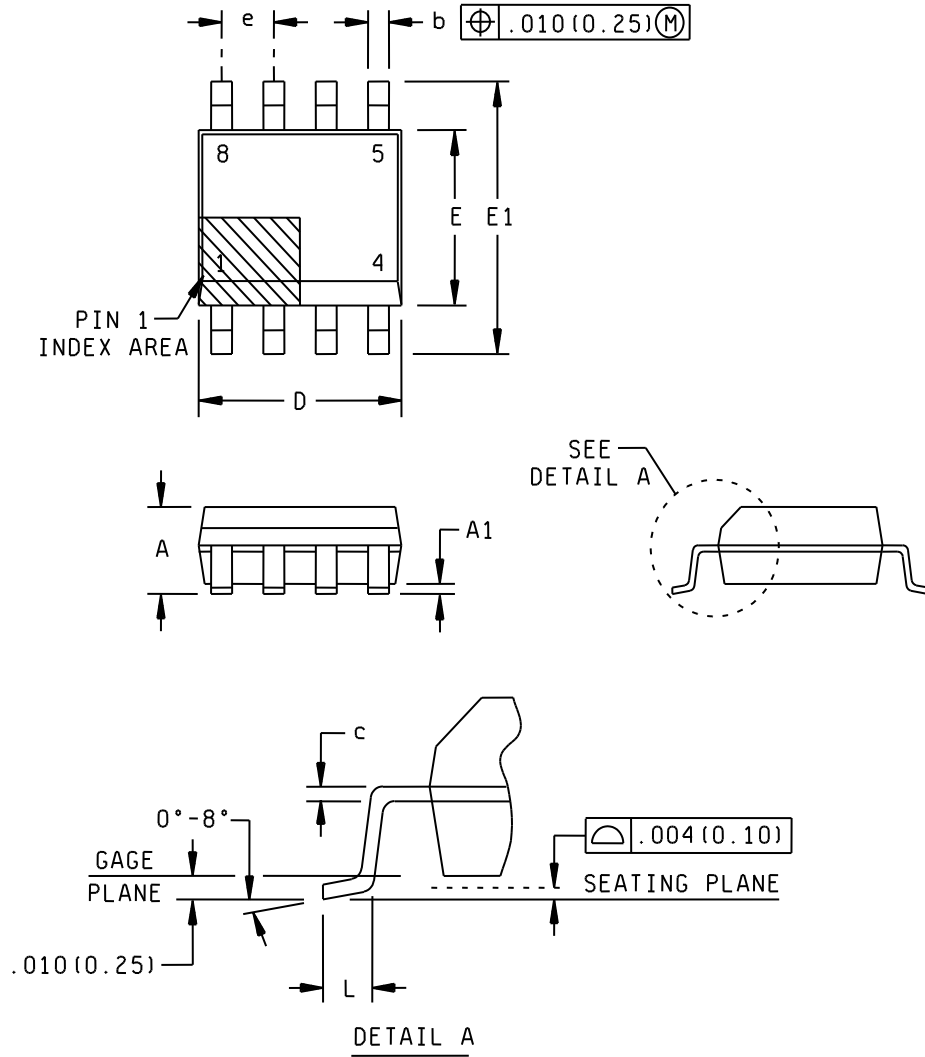


FIGURE 1. Case outline.

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Case X

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0532	0.0688	1.35	1.75
A1	0.0040	0.0098	0.10	0.25
b	0.0122	0.0201	0.31	0.51
c	0.0067	0.0098	0.17	0.25
D	0.1890	0.1968	4.80	5.00
E	0.1497	0.1574	3.80	4.00
E1	0.2284	0.2441	5.80	6.20
e	0.0500 BSC		1.27 BSC	
L	0.0157	0.0500	0.40	1.27
n	8		8	

NOTES:

1. Controlling dimensions are millimeter, inch dimensions are given for reference only and are not appropriate for use in design.
2. Falls with JEDEC MS-012-AA.

FIGURE 1. Case outline – Continued.

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Device types	01, 02, 03
Case outline	X
Terminal number	Terminal symbol
1	TP (SEE NOTE 1)
2	V _{IN}
3	NC (SEE NOTE 2)
4	GND
5	TRIM
6	V _{OUT}
7	COMPENSATION (COMP)
8	TP (SEE NOTE 1)

NOTES:

1. TP = test pin (do not connect).
2. NC = no connection.

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
V62/11602-01XE	24355	Reel, 1,000 units	ADR434TRZ-EP-R7
		Tube, 98 units	ADR434TRZ-EP
V62/11602-02XE	24355	Reel, 1,000 units	ADR435TRZ-EP-R7
		Tube, 98 units	ADR435TRZ-EP
V62/11602-03XE	24355	Reel, 1,000 units	ADR431TRZ-EP-R7
		Tube, 98 units	ADR431TRZ-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: 20 Alpha Road
 Chelmsford, MA 01824-4123

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