

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Make clarifications to notes 2 and 3 for both case outlines under figure 1. Update boilerplate paragraphs to current requirements. - ro	15-03-26	C. SAFFLE



CURRENT DESIGN ACTIVITY CAGE CODE 16236  
 HAS CHANGED NAMES TO:  
 DLA LAND AND MARITIME  
 COLUMBUS, OHIO 43218-3990

Prepared in accordance with ASME Y14.24

Vendor item drawing

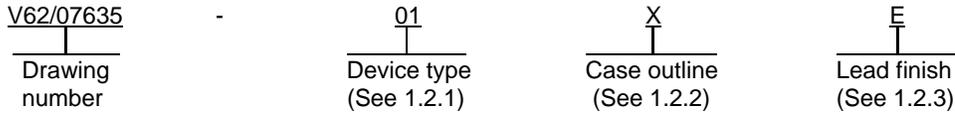
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REV STATUS OF PAGES	REV	A	A	A	A	A	A	A	A	A	A	A	A	A						
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PMIC N/A	PREPARED BY RICK OFFICER	DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	
Original date of drawing YY-MM-DD  08-03-05	CHECKED BY RAJESH PITHADIA	TITLE MICROCIRCUIT, LINEAR, 1.8 V, NANOPower, PUSH/PULL OUTPUT COMPARATORS, MONOLITHIC SILICON	
	APPROVED BY ROBERT M. HEBER		
	SIZE A	CODE IDENT. NO. 16236	DWG NO. <b>V62/07635</b>
	REV A		PAGE 1 OF 12

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance 1.8 V, nanopower, push/pull output comparator 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	TLV3491A-EP	1.8 V, nanopower, push/pull output single comparator
02	TLV3492A-EP	1.8 V, nanopower, push/pull output dual comparator
03	TLV3494A-EP	1.8 V, nanopower, push/pull output quad comparator

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 surface mount
Y	14	MS-012-AB	Plastic surface mount

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

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

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	SIZE <b>A</b>	CODE IDENT NO. <b>16236</b>	DWG NO. <b>V62/07635</b>
		REV    A	PAGE    2

1.3 Absolute maximum ratings. 1/

Supply voltage (V+).....	5.5 V
Signal input terminals:	
Voltage .....	(V-) – 0.5 V to (V+) + 0.5 V 2/
Current .....	±10 mA 2/
Output short circuit (I <sub>OS</sub> ) .....	Continuous 3/
Power dissipation (P <sub>D</sub> ) : T <sub>A</sub> = +25°C	
Case X .....	755 mW
Case Y .....	935 mW
Storage temperature range .....	-65°C to +150°C
Junction temperature range (T <sub>J</sub> ) .....	+150°C
Lead temperature (soldering, 10 seconds) .....	+300°C
Electrostatic rating:	
Human body model (HBM) .....	3000 V
Thermal resistance, junction to case (θ <sub>JC</sub> ):	
Case X .....	45°C/W
Case Y .....	55°C/W
Thermal resistance, junction to ambient (θ <sub>JA</sub> ):	
Case X .....	165°C/W
Case Y .....	133°C/W

1.4 Recommended operating conditions. 4/

Supply voltage range (V+) .....	1.8 V to 5.5 V
Operating free-air temperature range (T <sub>A</sub> ) .....	-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/ Input terminals are diode clamped to the power supply rails. Input signals that can swing more than 0.5 V beyond the supply rails should be current limited to 10 mA or less.
- 3/ Short circuit to ground, one amplifier per package.
- 4/ 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.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		REV    A	PAGE    3

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 <http://www.jedec.org> or from JEDEC – Solid State Technology Association, 3103 North 10th Street, Suite 240–S, Arlington, VA 22201-2107).

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 outlines. The case outlines 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.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		REV     A	PAGE    4

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions 2/	Temperature, T <sub>A</sub>	Device type	Limits		Unit
					Min	Max	
Input offset voltage section							
Input offset voltage	V <sub>OS</sub>	V <sub>CM</sub> = 0 V, I <sub>O</sub> = 0 mA	+25°C	All		±15	mV
			-55°C to +125°C			±25	
Input offset voltage versus temperature	$\Delta V_{OS} / \Delta T$		-55°C to +125°C	All	±12 typical		μV / °C
Input offset voltage versus power supply	PSRR	V <sub>S</sub> = 1.8 V to 5.5 V	+25°C	All		1000	μV/V
			-55°C to +125°C			1600	
Input bias current section							
Input bias current	I <sub>B</sub>	V <sub>CM</sub> = V <sub>CC</sub> / 2	+25°C	All		±50	pA
			-55°C to +125°C			±1600	
Input offset current	I <sub>OS</sub>	V <sub>CM</sub> = V <sub>CC</sub> / 2	+25°C	All		±50	pA
			-55°C to +125°C			±200	
Input voltage range section							
Common mode voltage range definition	V <sub>CM</sub>		+25°C		(V-) - 0.2	(V+) + 0.2	V
Common mode rejection ratio	CMRR	V <sub>CM</sub> = -0.2 V to (V+) - 1.5 V	+25°C	All	60		dB
			-55°C to +125°C		55		
		V <sub>CM</sub> = -0.2 V to (V+) + 0.2 V	+25°C		54		
			-55°C to +125°C		50		
Input capacitance section							
Common mode			+25°C	All	2 typical		pF
Differential			+25°C	All	4 typical		pF

See footnotes at end of table.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		<b>REV A</b>	<b>PAGE 5</b>

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions <u>2/</u>	Temperature, T <sub>A</sub>	Device type	Limits		Unit
					Min	Max	
Switching characteristics section							
Propagation delay time, low to high	t <sub>(PLH)</sub>	Input overdrive = 10 mV, f = 10 kHz, V <sub>STEP</sub> = 1 V	+25°C	All	12 typical		μs
		Input overdrive = 100 mV, f = 10 kHz, V <sub>STEP</sub> = 1 V			6 typical		
Propagation delay time, high to low	t <sub>(PHL)</sub>	Input overdrive = 10 mV, f = 10 kHz, V <sub>STEP</sub> = 1 V	+25°C	All	13.5 typical		μs
		Input overdrive = 100 mV, f = 10 kHz, V <sub>STEP</sub> = 1 V			6.5 typical		
Rise time	t <sub>R</sub>	C <sub>L</sub> = 10 pF	+25°C	All	100 typical		ns
Fall time	t <sub>F</sub>	C <sub>L</sub> = 10 pF	+25°C	All	100 typical		ns
Output section							
Voltage output high from rail	V <sub>OH</sub>	V <sub>S</sub> = 5 V, I <sub>OUT</sub> = -5 mA	-55°C to +125°C	All		300	mV
Voltage output low from rail	V <sub>OL</sub>	V <sub>S</sub> = 5 V, I <sub>OUT</sub> = 5 mA	-55°C to +125°C	All		300	mV
Power supply section							
Specified voltage range	V <sub>S</sub>		+25°C	All	1.8	5.5	V
Quiescent current <u>3/</u>	I <sub>Q</sub>	V <sub>S</sub> = 5.5 V, V <sub>O</sub> = high	+25°C	All		1.2	μA
			-55°C to +125°C			2.1	

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, V<sub>S</sub> = 1.8 V to 5.5 V.

3/ I<sub>Q</sub> per channel.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		<b>REV A</b>	<b>PAGE 6</b>

Case X

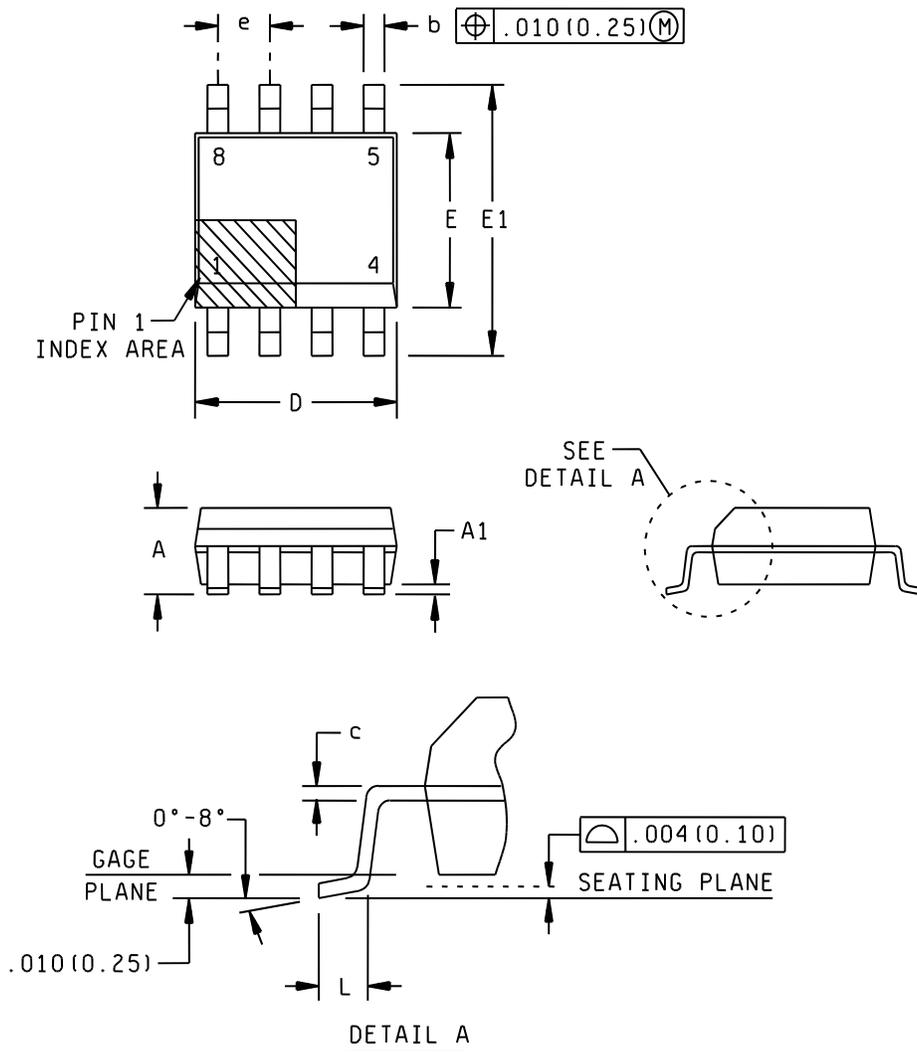


FIGURE 1. Case outlines.

<p><b>DEFENSE SUPPLY CENTER, COLUMBUS</b>  <b>COLUMBUS, OHIO</b></p>	<p>SIZE  <b>A</b></p>	<p>CODE IDENT NO.  <b>16236</b></p>	<p>DWG NO.  <b>V62/07635</b></p>
		<p>REV    <b>A</b></p>	<p>PAGE    <b>7</b></p>

Case X – continued.

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	---	0.069	---	1.75
A1	0.004	0.010	0.10	0.25
b	0.012	0.020	0.31	0.51
c	0.007	0.010	0.17	0.25
D	0.189	0.197	4.80	5.00
E	0.150	0.157	3.80	4.00
E1	0.228	0.244	5.80	6.20
e	0.050 BSC		1.27 BSC	
L	0.016	0.050	0.40	1.27
n	8		8	

NOTES:

1. Controlling dimensions are inch, millimeter dimensions are given for reference only.
2. For dimension D, body length does not include mold flash, protrusion, or gate burrs. Mold flash, protrusion, or gate burrs shall not to exceed 0.006 inch (0.15 mm).
3. For dimension E, body width does not include interlead flash. Interlead flash shall not exceed 0.017 inch (0.43 mm) per side.
4. Falls within reference to JEDEC MS-012-AA.

FIGURE 1. Case outlines- continued.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		REV A	PAGE 8

Case Y

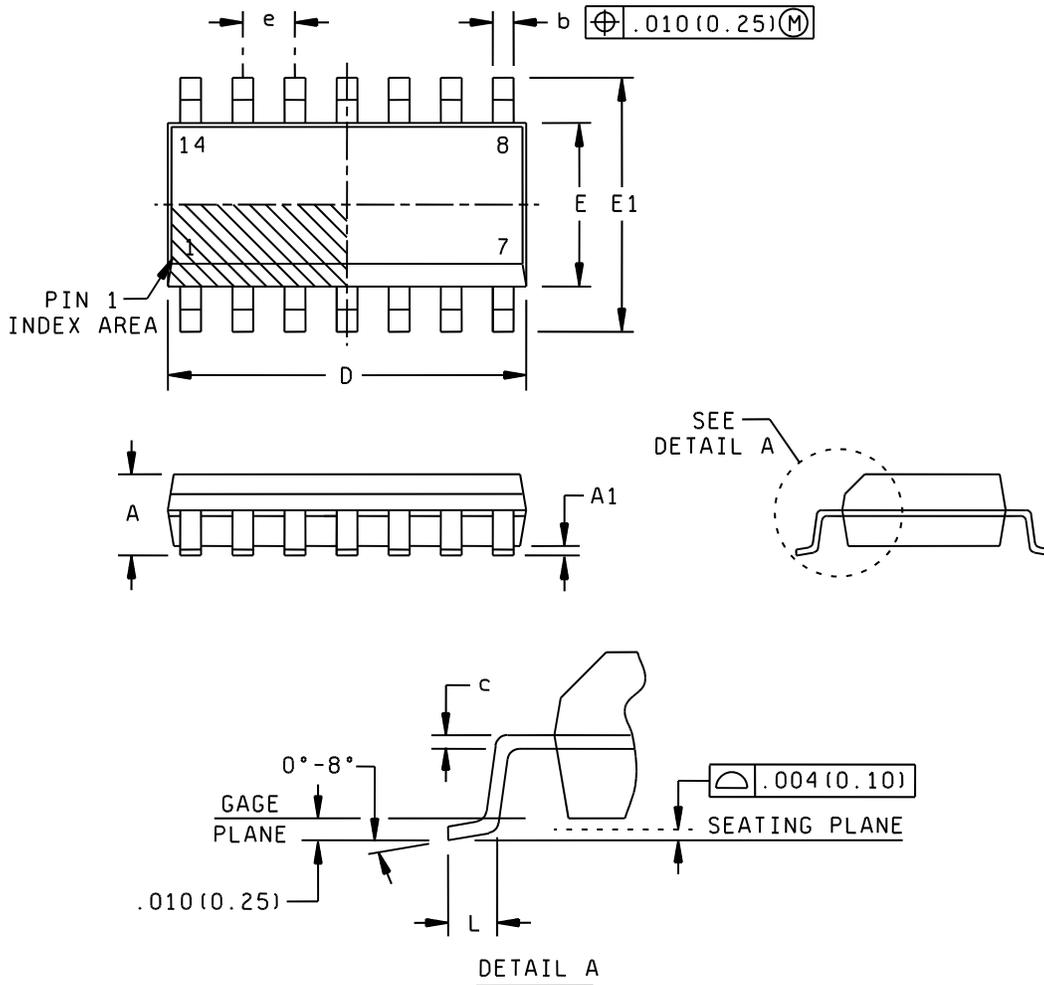


FIGURE 1. Case outlines – Continued.

<p><b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b></p>	<p><b>SIZE A</b></p>	<p><b>CODE IDENT NO. 16236</b></p>	<p><b>DWG NO. V62/07635</b></p>
		<p>REV A</p>	<p>PAGE 9</p>

Case Y – continued.

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	---	.069	---	1.75
A1	.004	.010	0.10	0.25
b	.012	.020	0.31	0.51
c	.007	.010	0.17	0.25
D	.337	.344	8.55	8.75
e	.050 BSC		1.27 BSC	
E	.150	.157	3.80	4.00
E1	.228	.244	5.80	6.20
L	.016	.050	0.40	1.27
n	14 leads		14 leads	

NOTES:

1. Controlling dimensions are inch, millimeter dimensions are given for reference only.
2. For dimension D, body length does not include mold flash, protrusion, or gate burrs. Mold flash, protrusion, or gate burrs shall not to exceed 0.006 inch (0.15 mm).
3. For dimension E, body width does not include interlead flash. Interlead flash shall not exceed 0.017 inch (0.43 mm) per side.
4. Falls within reference to JEDEC MS-012-AB.

FIGURE 1. Case outlines - Continued.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		REV A	PAGE 10

Device types	01	02	03
Case outlines	X	X	Y
Terminal number	Terminal symbol		
1	NC	OUTPUT A	OUTPUT A
2	-INPUT	-INPUT A	-INPUT A
3	+INPUT	+INPUT A	+INPUT A
4	V-	V-	V+
5	NC	+INPUT B	+INPUT B
6	OUTPUT	-INPUT B	-INPUT B
7	V+	OUTPUT B	OUTPUT B
8	NC	V+	OUTPUT C
9	---	---	-INPUT C
10	---	---	+INPUT C
11	---	---	V-
12	---	---	+INPUT D
13	---	---	-INPUT D
14	---	---	OUTPUT D

FIGURE 2. Terminal connections.

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		REV A	PAGE 11

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 <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

Vendor item drawing administrative control number <u>1/ 2/</u>	Device manufacturer CAGE code	Transport media, quantity	Package marking	Vendor part number
V62/07635-01XE	<u>3/</u>	Tape and reel, 2500	3491EP	TLV3491AMDREP
V62/07635-02XE	01295	Tape and reel, 2500	3492EP	TLV3492AMDREP
V62/07635-03YE	<u>3/</u>	Tape and reel, 2500	3494EP	TLV3494AMDREP

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

2/ Package drawings, thermal; data, and symbolization are available from the manufacturer.

3/ Not available from an approved source of supply.

CAGE code

01295

Source of supply

Texas Instruments, Inc.  
 Semiconductor Group  
 8505 Forest Lane  
 P.O. Box 660199  
 Dallas, TX 75243  
 Point of contact: U.S. Highway 75 South  
 P.O. Box 84, M/S 853  
 Sherman, TX 75090-9493

<b>DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 16236</b>	<b>DWG NO. V62/07635</b>
		<b>REV     A</b>	<b>PAGE    12</b>