REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.24

Vendor item drawing

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	PAGE	1	2	3	4	5	6	7	8	9	10	11	12								

PMIC N/A	**PREPARED BY** RICK OFFICER	**DEFENSE SUPPLY CENTER COLUMBUS** **COLUMBUS, OHIO 43218-3990**
Original date of drawing YY-MM-DD 06-07-05	**CHECKED BY** TOM HESS	**TITLE** MICROCIRCUIT, LINEAR, PRECISION VIRTUAL GROUND, MONOLITHIC SILICON
	APPROVED BY RAYMOND MONNIN	
	SIZE **A** / **CODE IDENT. NO.** **16236**	**DWG NO.** **V62/06601**
	REV	**PAGE** 1 **OF** 12

1. SCOPE

1.1 Scope. This drawing documents the general requirements of a high performance precision virtual ground microcircuit, with an operating temperature range of -55°C to +125°C.

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

V62/06601	-	01	X	E
Drawing number		Device type (See 1.2.1)	Case outline (See 1.2.2)	Lead finish (See 1.2.3)

1.2.1 Device type(s).

Device type	Generic	Circuit function
01	TLE2426-EP	Precision virtual ground

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

Outline letter	Number of pins	JEDEC PUB 95	Package style
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 manufacture:

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

1.3 Absolute maximum ratings. 1/

Continuous input voltage (V_I) ..... 40 V
Continuous filter trap voltage ..... 40 V
Output current (I_O) ..... ±80 mA
Duration of short circuit current at (or below) 25°C ..... Unlimited 2/
Continuous total power dissipation (P_D) ..... See dissipation rating table
Operating junction temperature range (T_J) ..... +150°C 3/
Storage temperature range (T_{STG}) ..... +150°C 3/
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds ..... +260°C

1.4 Recommended operating conditions. 4/

Input voltage (V_I) ..... 4 V to 40 V
Operating free-air temperature range (T_A) ..... -55°C to +125°C

1.5 Dissipation rating table.

Package	$T_A \leq 25°C$ power rating	Derating factor above $T_A = 25°C$	$T_A = 70°C$ power rating	$T_A = 85°C$ power rating	$T_A = 125°C$ power rating
X	1102 mV	10.3 mW/°C	638.5 mW	484 mW	72.1 mW

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/ The output may be shorted to either supply. Temperature and/or supply voltages must be limited to ensure that the maximum dissipation rating is not exceeded.
3/ Long term high temperature storage and/or usage at the absolute maximum ratings may result in a reduction of overall device life. See http://www.ti.com/ep_quality for additional information on enhanced plastic packaging.
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.

2. APPLICABLE DOCUMENTS

JEDEC PUB 95 – Registered and Standard Outlines for Semiconductor Devices

(Applications for copies should be addressed to the Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834 or online at http://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.

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions V_I = 5 V, I_O = 0, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Output voltage	V_{OUT}	V_I = 4 V	+25°C	01	1.98	2.02	V
		V_I = 5 V			2.48	2.52	
		V_I = 40 V			19.8	20.2	
		V_I = 5 V	-55°C to +125°C		2.465	2.535	
Temperature coefficient of output voltage	TC_V		-55°C to +125°C	01	25 typical		ppm / °C
Supply current	I_{CC}	V_I = 5 V, no load	+25°C	01		300	µA
		V_I = 4 V to 40 V, no load	+25°C			350	
			-55°C to +125°C			400	
Output voltage 2/ regulation (sourcing current)	R_{OUT-}	I_O = 0 to -10 mA	+25°C	01		±0.7	mV
			-55°C to +125°C			±10	
		I_O = 0 to -20 mA	+25°C			±1.4	
Output voltage 2/ regulation (sinking current)	R_{OUT+}	I_O = 0 to 10 mA	+25°C	01		±0.5	mV
		I_O = 0 to 8 mA	-55°C to +125°C			±10	
		I_O = 0 to 20 mA	+25°C			±1.4	
Output impedance 2/	Z_O		+25°C	01		22.5	mΩ
Noise reduction impedance	NRI		+25°C	01	110 typical		kΩ
Short circuit current	I_{OS}	Sinking current, V_O = 5 V	+25°C	01	26 typical		mA
		Sourcing current, V_O = 0 V			-47 typical		
Output noise voltage, rms	V_{ON}	C_{NR} = 0, f = 10 Hz to 10 kHz	+25°C	01	120 typical		µV
		C_{NR} = 1 µF, f = 10 Hz to 10 kHz			30 typical		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_I = 5 V, I_O = 0, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Output voltage current step response	I_{OSR}	C_L = 0, V_O to 0.1%, I_O = ±10 mA	+25°C	01	290 typical		µs
		C_L = 100 pF, V_O to 0.1%, I_O = ±10 mA			275 typical		
		C_L = 0, V_O to 0.01%, I_O = ±10 mA			400 typical		
		C_L = 100 pF, V_O to 0.01%, I_O = ±10 mA			390 typical		
Step response	SR	C_L = 100 pF, V_I = 0 to 5 V, V_O to 0.1 %	+25°C	01	20 typical		µs
		C_L = 100 pF, V_I = 0 to 5 V, V_O to 0.01 %			120 typical		

See footnotes at end of table.

TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions V_I = 12 V, I_O = 0, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Output voltage	V_{OUT}	V_I = 4 V	+25°C	01	1.98	2.02	V
		V_I = 12 V			5.95	6.05	
		V_I = 40 V			19.8	20.2	
		V_I = 12 V	-55°C to +125°C		5.925	6.075	
Temperature coefficient of output voltage	TC_V		-55°C to +125°C	01	35 typical		ppm / °C
Supply current	I_{CC}	V_I = 12 V, no load	+25°C	01		300	μA
		V_I = 4 V to 40 V, no load	+25°C			350	
			-55°C to +125°C			400	
Output voltage 2/ regulation (sourcing current)	R_{OUT-}	I_O = 0 to -10 mA	+25°C	01		±10	mV
			-55°C to +125°C			±10	
		I_O = 0 to -20 mA	+25°C			±10	
Output voltage 2/ regulation (sinking current)	R_{OUT+}	I_O = 0 to 10 mA	+25°C	01		±10	mV
		I_O = 0 to 8 mA	-55°C to +125°C			±10	
		I_O = 0 to 20 mA	+25°C			±10	
Output impedance 2/	Z_O		+25°C	01		22.5	mΩ
Noise reduction impedance	NRI		+25°C	01	110 typical		kΩ
Short circuit current	I_{OS}	Sinking current, V_O = 12 V	+25°C	01	31 typical		mA
		Sourcing current, V_O = 0 V			-70 typical		
Output noise voltage, rms	V_{ON}	C_{NR} = 0, f = 10 Hz to 10 kHz	+25°C	01	120 typical		μV
		C_{NR} = 1 μF, f = 10 Hz to 10 kHz			30 typical		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued. 1/

Test	Symbol	Conditions V_I = 12 V, I_O = 0, unless otherwise specified	Temperature, T_A	Device type	Limits		Unit
					Min	Max	
Output voltage current step response	I_{OSR}	C_L = 0, V_O to 0.1%, I_O = ±10 mA	+25°C	01	290 typical		µs
		C_L = 100 pF, V_O to 0.1%, I_O = ±10 mA			275 typical		
		C_L = 0, V_O to 0.01%, I_O = ±10 mA			400 typical		
		C_L = 100 pF, V_O to 0.01%, I_O = ±10 mA			390 typical		
Step response	SR	C_L = 100 pF, V_I = 0 to 12 V, V_O to 0.1 %	+25°C	01	12 typical		µs
		C_L = 100 pF, V_I = 0 to 12 V, V_O to 0.01 %			120 typical		

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/ The listed value is not production tested.

Case X

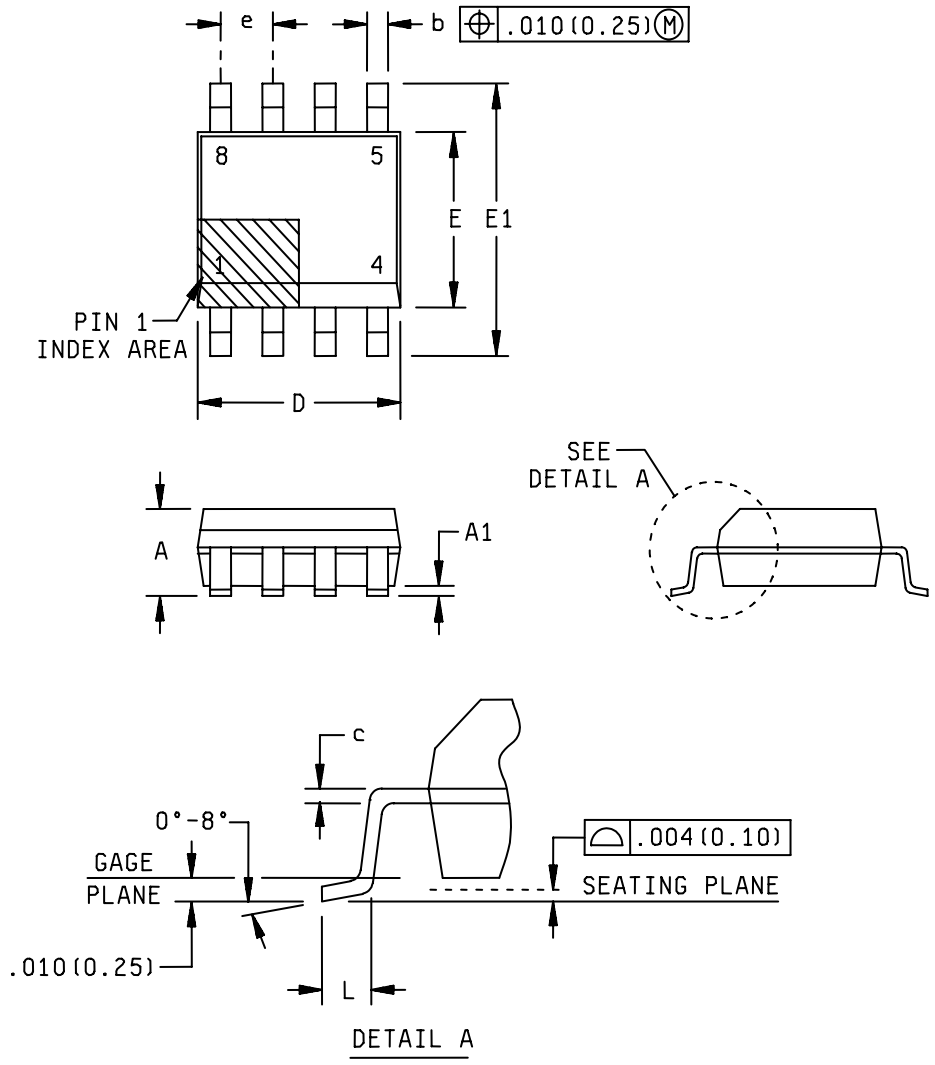

FIGURE 1. Case outlines.

DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO	SIZE A	CODE IDENT NO. 16236	DWG NO. V62/06601
		REV	PAGE 9

Case X

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 nominal		1.27 nominal	
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. Body dimensions do not include mold flash or protrusion not to exceed 0.006 inch (0.15 mm).
3. Falls with JEDEC MS-012-AA.

FIGURE 1. Case outlines – Continued.

Device type	01
Case outline	X
Terminal number	Terminal symbol
1	OUT
2	COMMON
3	IN
4	NC
5	NC
6	NC
7	NC
8	NOISE REDUCTION

NC = No connection

FIGURE 2. Terminal connections.

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.

Vendor item drawing administrative control number 1/	Device manufacturer CAGE code	Package 2/		Top side marking	Vendor part number
V62/06601-01XE	01295	SOIC	Tape and reel	2426EP	TLE2426MDREP

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

2/ Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

CAGE code	Source of supply
01295	Texas Instruments, Inc. Semiconductor Group 8505 Forest Ln. PO Box 660199 Dallas, TX 75243 Point of contact: U.S. Highway 75 South P.O. Box 84, M/S 853 Sherman, TX 75090-9493