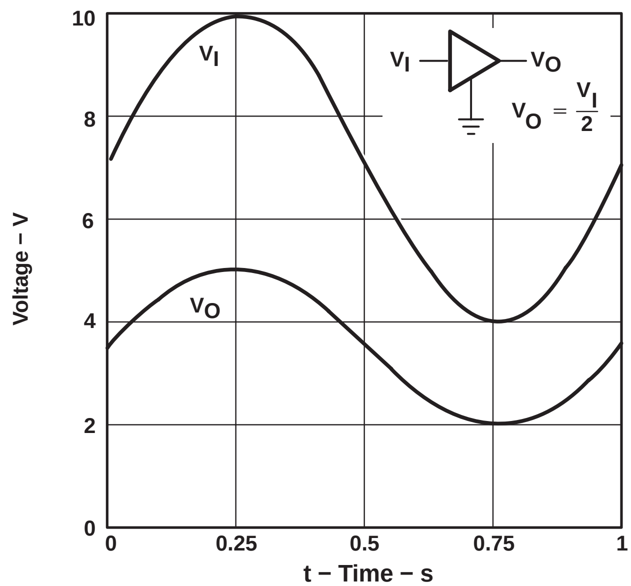
- **1/2 V_I Virtual Ground for Analog Systems**
- **Self-Contained 3-terminal TO-226AA Package**
- **Micropower Operation . . . 170 µA Typ, V_I = 5 V**
- **Wide V_I Range . . . 4 V to 40 V**
- **High Output-Current Capability**
  - **Source . . . 20 mA Typ**
  - **Sink . . . 20 mA Typ**
- **Excellent Output Regulation**
  - **−45 µV Typ at I_O = 0 to −10 mA**
  - **+15 µV Typ at I_O = 0 to +10 mA**
- **Low-Impedance Output . . . 0.0075 Ω Typ**
- **Noise Reduction Pin (D, JG, and P Packages Only)**

INPUT/OUTPUT TRANSFER CHARACTERISTICS



description

In signal-conditioning applications utilizing a single power source, a reference voltage equal to one-half the supply voltage is required for termination of all analog signal grounds. Texas Instruments presents a precision virtual ground whose output voltage is always equal to one-half the input voltage, the TLE2426 "rail splitter."

The unique combination of a high-performance, micropower operational amplifier and a precision-trimmed divider on a single silicon chip results in a precise V_O/V_I ratio of 0.5 while sinking and sourcing current. The TLE2426 provides a low-impedance output with 20 mA of sink and source capability while drawing less than 280 µA of supply current over the full input range of 4 V to 40 V. A designer need not pay the price in terms of board space for a conventional signal ground consisting of resistors, capacitors, operational amplifiers, and voltage references. The performance and precision of the TLE2426 is available in an easy-to-use, space saving, 3-terminal LP package. For increased performance, the optional 8-pin packages provide a noise-reduction pin. With the addition of an external capacitor (C_{NR}), peak-to-peak noise is reduced while line ripple rejection is improved.

Initial output tolerance for a single 5-V or 12-V system is better than 1% with 3.6% over the full 40-V input range. Ripple rejection exceeds 12 bits of accuracy. Whether the application is for a data acquisition front end, analog signal termination, or simply a precision voltage reference, the TLE2426 eliminates a major source of system error.

AVAILABLE OPTIONS

T_A	PACKAGED DEVICES				CHIP FORM (Y)
	SMALL OUTLINE (D)	CERAMIC DIP (JG)	PLASTIC (LP)	PLASTIC DIP (P)	
0°C to 70°C	TLE2426CD	—	TLE2426CLP	TLE2426CP	

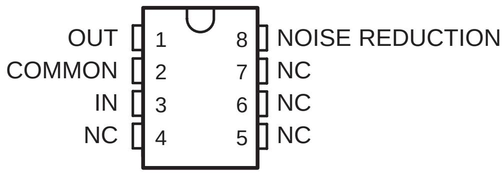
−40°C to 85°C	TLE2426ID	—	TLE2426ILP	TLE2426IP	TLE2426Y
−55°C to 125°C	TLE2426MD	TLE2426MJG	TLE2426MLP	TLE2426MP	

The D and LP packages are available taped and reeled in the commercial temperature range only. Add R suffix to the device type (e. g., TLC2426CDR). Chips are tested at 25°C.

description (continued)

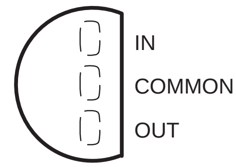
The C-suffix devices are characterized for operation from 0°C to 70°C. The I suffix devices are characterized for operation from −40°C to 85°C. The M suffix devices are characterized over the full military temperature range of −55°C to 125°C.

D, JG, OR P PACKAGE
(TOP VIEW)



NC − No internal connection

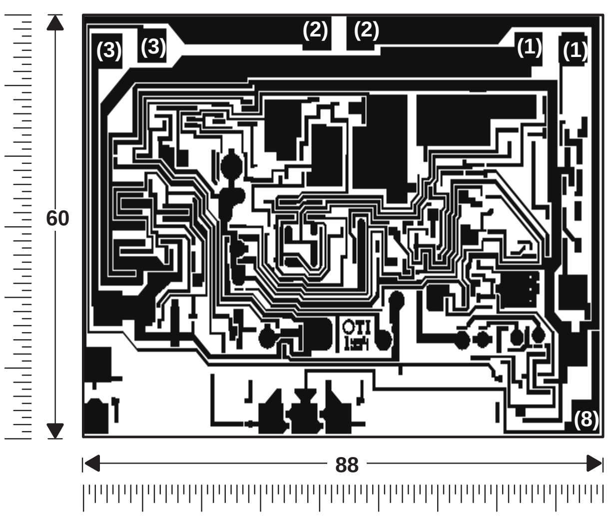
LP PACKAGE
(TOP VIEW)

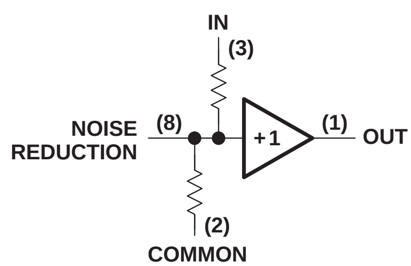


TLE2426Y chip information

This chip, properly assembled, displays characteristics similar to the TLE2426C. Thermal compression or ultrasonic bonding may be used on the doped aluminum bonding pads. The chips may be mounted with conductive epoxy or a gold-silicon preform.

BONDING PAD ASSIGNMENTS





CHIP THICKNESS:
15 MILS TYPICAL

BONDING PADS:
4 × 4 MILS MINIMUM

$T_J$max = 150°C

TOLERANCES ARE ±10%.

ALL DIMENSIONS ARE IN MILS.

NOTE A: Both bonding pads numbered 1, both numbered 2, and both numbered 3, must be bonded out to the corresponding functions pin.

absolute maximum ratings over operating free-air temperature (unless otherwise noted)†

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 (see Note 1) . . . . . unlimited
Continuous total power dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A: C suffix . . . . . 0°C to 70°C
I suffix . . . . . −40°C to 85°C
M suffix . . . . . −55°C to 125°C
Storage temperature range, T_{stg} . . . . . −65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or P package . . . . . 260°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: JG or LP package . . . . . 300°C

† Stresses beyond 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 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.

NOTE 1: 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.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ 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
D	725 mV	5.8 mW/°C	464 mW	377 mW	145 mW
JG	1050 mV	8.4 mW/°C	672 mW	546 mW	210 mW
LP	775 mV	6.2 mW/°C	496 mW	403 mW	155 mW
P	1000 mV	8.0 mW/°C	640 mW	520 mW	200 mW

recommended operating conditions

	C SUFFIX		I SUFFIX		M SUFFIX		UNIT
	MIN	MAX	MIN	MAX	MIN	MAX	
Input voltage, V_I	4	40	4	40	4	40	V
Operating free-air temperature, T_A	0	70	−40	85	−55	125	°C

electrical characteristics at specified free-air temperature, V_I = 5 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 5 V			2.48	2.5	2.52	
	V_I = 40 V			19.8	20	20.2	
	V_I = 5 V		Full range	2.475		2.525	
Temperature coefficient of output voltage			Full range		25		ppm/°C
Supply current	No load	V_I = 5 V	25°C		170	300	μA
		V_I = 4 to 40 V	Full range			400	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	μV
			Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	μV
			Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current, V_O = 5 V		25°C		26		mA
	Sourcing current, V_O = 0				−47		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		μV
		C_{NR} = 1 μF			30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		μs
		C_L = 100 pF			275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
		C_L = 100 pF			390		
Step response	V_I = 0 to 5 V, V_O to 0.1%	C_L = 100 pF	25°C		20		μs
	V_I = 0 to 5 V, V_O to 0.01%				160		

† Full range is 0°C to 70°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 12 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426C MIN	TLE2426C TYP	TLE2426C MAX	UNIT
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 12 V		25°C	5.95	6	6.05	
	V_I = 40 V		25°C	19.8	20	20.2	
	V_I = 12 V		Full range	5.945		6.055	
Temperature coefficient of output voltage			Full range		35		ppm/°C
Supply current	No load	V_I = 12 V	25°C		195	300	µA
		V_I = 4 to 40 V	Full range			400	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	µV
			Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	µV
			Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current,	V_O = 12 V	25°C		31		mA
	Sourcing current,	V_O = 0	25°C		−70		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		µV
		C_{NR} = 1 µF	25°C		30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		µs
		C_L = 100 pF	25°C		275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
		C_L = 100 pF	25°C		390		
Step response	V_I = 0 to 12 V, V_O to 0.1%	C_L = 100 pF	25°C		20		µs
	V_I = 0 to 12 V, V_O to 0.01%	C_L = 100 pF	25°C		120		

† Full range is 0°C to 70°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 5 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426I MIN	TLE2426I TYP	TLE2426I MAX	UNIT
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 5 V		25°C	2.48	2.5	2.52	
	V_I = 40 V		25°C	19.8	20	20.2	
	V_I = 5 V		Full range	2.47		2.53	
Temperature coefficient of output voltage			Full range		25		ppm/°C
Supply current	No load	V_I = 5 V	25°C		170	300	μA
	No load	V_I = 4 to 40 V	Full range			400	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	μV
	I_O = 0 to −10 mA		Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	μV
	I_O = 0 to 8 mA		Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current,	V_O = 5 V	25°C		26		mA
	Sourcing current,	V_O = 0	25°C		−47		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		μV
	f = 10 Hz to 10 kHz	C_{NR} = 1 μF	25°C		30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		μs
	V_O to 0.1%, I_O = ±10 mA	C_L = 100 pF	25°C		275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
	V_O to 0.01%, I_O = ±10 mA	C_L = 100 pF	25°C		390		
Step response	V_I = 0 to 5 V, V_O to 0.1%	C_L = 100 pF	25°C		20		μs
	V_I = 0 to 5 V, V_O to 0.01%	C_L = 100 pF	25°C		160		

† Full range is −40°C to 85°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 12 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426I MIN	TLE2426I TYP	TLE2426I MAX	UNIT
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 12 V		25°C	5.95	6	6.05	
	V_I = 40 V		25°C	19.8	20	20.2	
	V_I = 12 V		Full range	5.935		6.065	
Temperature coefficient of output voltage			Full range		35		ppm/°C
Supply current	No load	V_I = 12 V	25°C		195	300	μA
	No load	V_I = 4 to 40 V	Full range			400	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	μV
	I_O = 0 to −10 mA		Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	μV
	I_O = 0 to 8 mA		Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current,	V_O = 12 V	25°C		31		mA
	Sourcing current,	V_O = 0	25°C		−70		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		μV
	f = 10 Hz to 10 kHz	C_{NR} = 1 μF	25°C		30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		μs
	V_O to 0.1%, I_O = ±10 mA	C_L = 100 pF	25°C		275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
	V_O to 0.01%, I_O = ±10 mA	C_L = 100 pF	25°C		390		
Step response	V_I = 0 to 12 V, V_O to 0.1%	C_L = 100 pF	25°C		20		μs
	V_I = 0 to 12 V, V_O to 0.01%	C_L = 100 pF	25°C		120		

† Full range is −40°C to 85°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 5 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426M MIN	TLE2426M TYP	TLE2426M MAX	UNIT
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 5 V			2.48	2.5	2.52	
	V_I = 40 V			19.8	20	20.2	
	V_I = 5 V		Full range	2.465		2.535	
Temperature coefficient of output voltage			Full range		25		ppm/°C
Supply current	No load	V_I = 5 V	25°C		170	300	µA
		V_I = 4 to 40 V	Full range			400	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	µV
			Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	µV
	I_O = 0 to 3 mA		Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current,	V_O = 5 V	25°C		26		mA
	Sourcing current,	V_O = 0			−47		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		µV
		C_{NR} = 1 µF			30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		µs
		C_L = 100 pF			275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
		C_L = 100 pF			390		
Step response	V_I = 0 to 5 V, V_O to 0.1%	C_L = 100 pF	25°C		20		µs
	V_I = 0 to 5 V, V_O to 0.01%				120		

† Full range is −55°C to 125°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 12 V, I_O = 0 (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_A†	TLE2426M MIN	TLE2426M TYP	TLE2426M MAX	UNIT
Output voltage	V_I = 4 V		25°C	1.98	2	2.02	V
	V_I = 12 V			5.95	6	6.05	
	V_I = 40 V			19.8	20	20.2	
	V_I = 12 V		Full range	5.925		6.075	
Temperature coefficient of output voltage			Full range		35		ppm/°C
Supply current	No load	V_I = 12 V	25°C		195	250	μA
		V_I = 4 to 40 V	Full range			350	
Output voltage regulation (sourcing current)‡	I_O = 0 to −10 mA		25°C		−45	±160	μV
			Full range			±250	
	I_O = 0 to −20 mA		25°C		−150	±450	
Output voltage regulation (sinking current)‡	I_O = 0 to 10 mA		25°C		15	±160	μV
	I_O = 0 to 8 mA		Full range			±250	
	I_O = 0 to 20 mA		25°C		65	±235	
Output impedance			25°C		7.5	22.5	mΩ
Noise-reduction impedance			25°C		110		kΩ
Short-circuit current	Sinking current,	V_O = 12 V	25°C		31		mA
	Sourcing current,	V_O = 0			−70		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0	25°C		120		μV
		C_{NR} = 1 μF			30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0	25°C		290		μs
		C_L = 100 pF			275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0	25°C		400		
		C_L = 100 pF			390		
Step response	V_I = 0 to 12 V, V_O to 0.1%	C_L = 100 pF	25°C		12		μs
	V_I = 0 to 12 V, V_O to 0.01%				120		

† Full range is −55°C to 125°C.
‡ The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 5 V, I_O = 0, T_A = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TLE2426Y MIN	TLE2426Y TYP	TLE2426Y MAX	UNIT
Output voltage	V_I = 5 V			2.5		V
Supply current	No load			170		μA
Output voltage regulation (sourcing current)†	I_O = 0 to −10 mA			−45		μV
	I_O = 0 to −20 mA			−150		
Output voltage regulation (sinking current)†	I_O = 0 to 10 mA			15		μV
	I_O = 0 to 20 mA			65		
Output impedance				7.5		mΩ
Noise-reduction impedance				110		kΩ
Short-circuit current	Sinking current, V_O = 5 V			26		mA
	Sourcing current, V_O = 0			−47		
Output noise voltage, rms	f = 10 Hz to 10 kHz	C_{NR} = 0		120		μV
		C_{NR} = 1 μF		30		
Output voltage current step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0		290		μs
		C_L = 100 pF		275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0		400		
		C_L = 100 pF		390		
Step response	V_I = 0 to 5 V, V_O to 0.1%	C_L = 100 pF		20		μs
	V_I = 0 to 5 V, V_O to 0.01%			160		

† The listed values are not production tested.

electrical characteristics at specified free-air temperature, V_I = 12 V, I_O = 0, T_A = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TLE2426Y MIN	TLE2426Y TYP	TLE2426Y MAX	UNIT
Output voltage	V_I = 12 V			6		V
Supply current	No load			195		μA
Output voltage regulation (sourcing current)†	I_O = 0 to −10 mA			−45		μV
	I_O = 0 to −20 mA			−150		
Output voltage regulation (sinking current)†	I_O = 0 to 3 mA			15		μV
	I_O = 0 to 20 mA			65		
Output impedance				7.5		mΩ
Noise-reduction impedance				110		kΩ
Short-circuit current	Sinking current, V_O = 12 V			31		mA
	Sourcing current, V_O = 0			−70		
Output noise voltage, rms	f = 10 Hz to 10 kHZ	C_{NR} = 0		120		μV
		C_{NR} = 1 μF		30		
Output voltage current, step response	V_O to 0.1%, I_O = ±10 mA	C_L = 0		290		μs
		C_L = 100 pF		275		
	V_O to 0.01%, I_O = ±10 mA	C_L = 0		400		
		C_L = 100 pF		390		
Step response	V_I = 0 to 12 V, V_O to 0.1%	C_L = 100 pF		12		μs
	V_I = 0 to 12 V, V_O to 0.01%			120		

† The listed values are not production tested.

TYPICAL CHARACTERISTICS

Table Of Graphs

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TYPICAL CHARACTERISTICS†

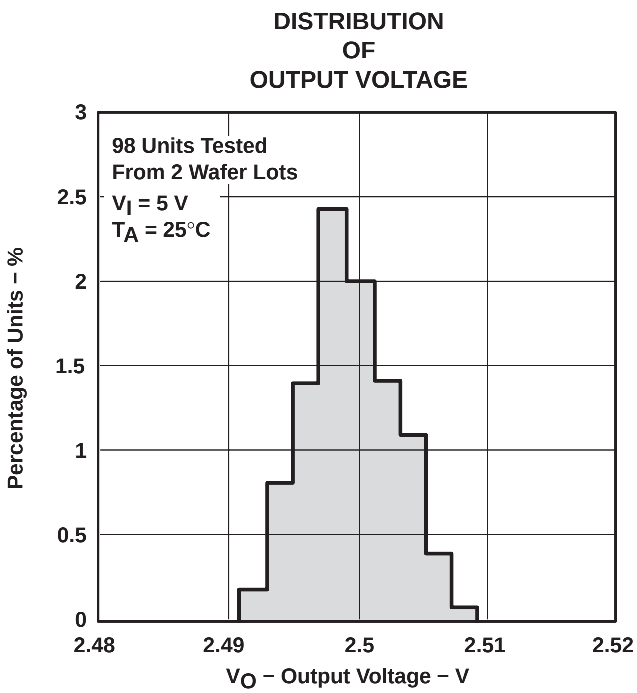

Figure 1

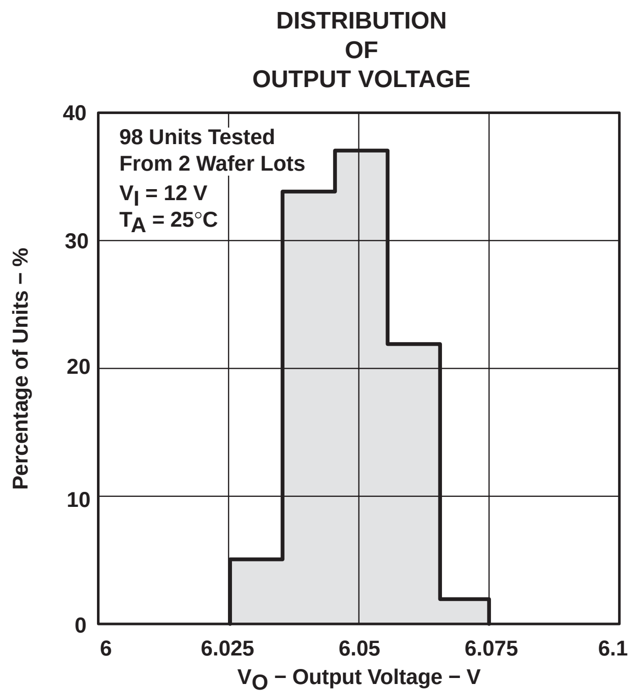

Figure 2

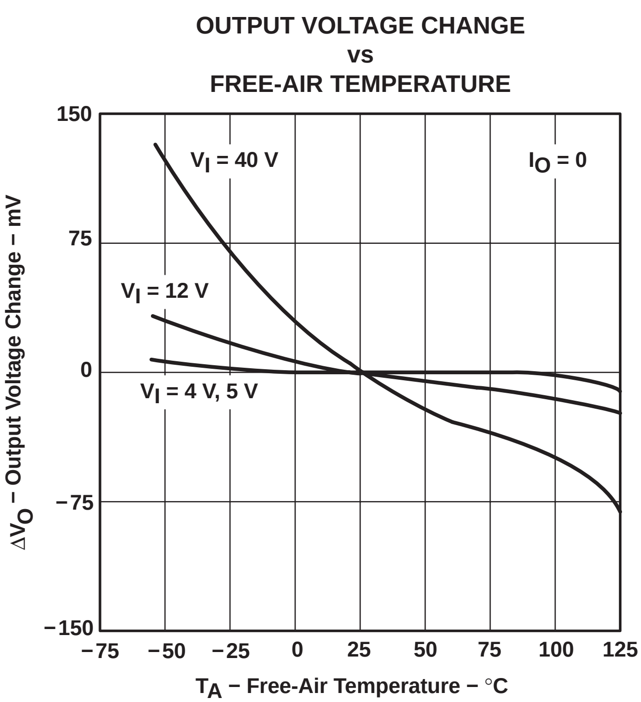

Figure 3

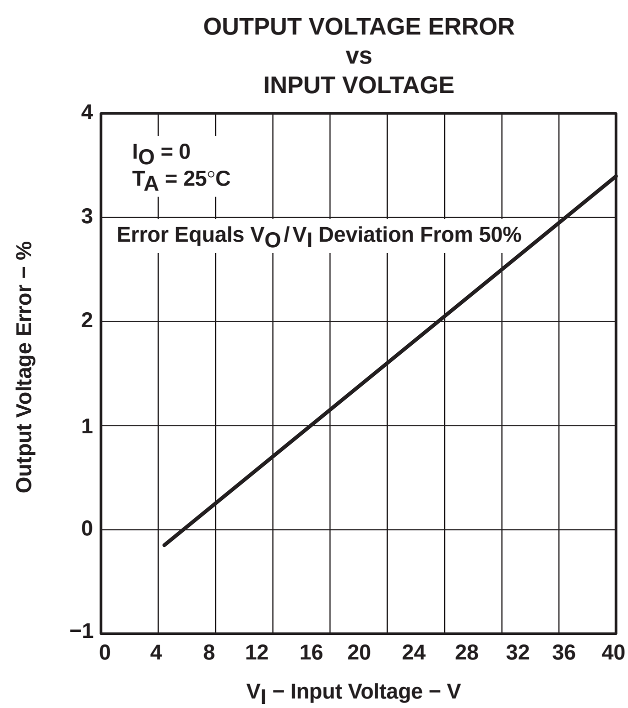

Figure 4

† Data at high and low temperatures are applicable within the rated operating free-air temperature ranges of the various devices.

TYPICAL CHARACTERISTICS†

INPUT BIAS CURRENT
vs
INPUT VOLTAGE

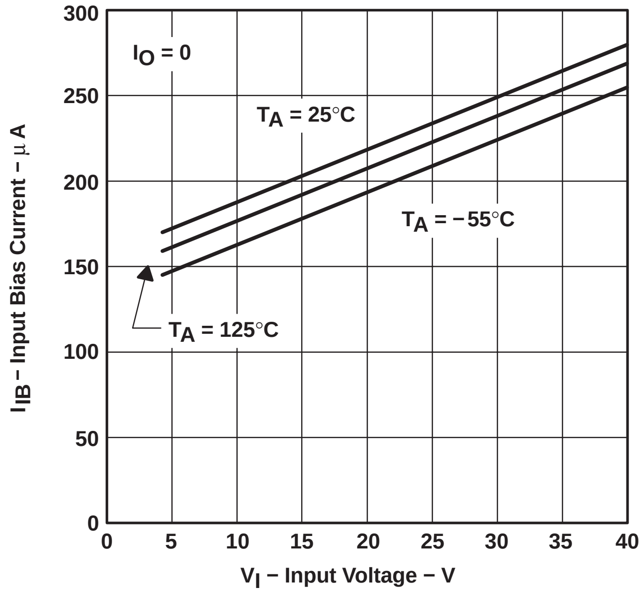

Figure 5

INPUT BIAS CURRENT
vs
FREE-AIR TEMPERATURE

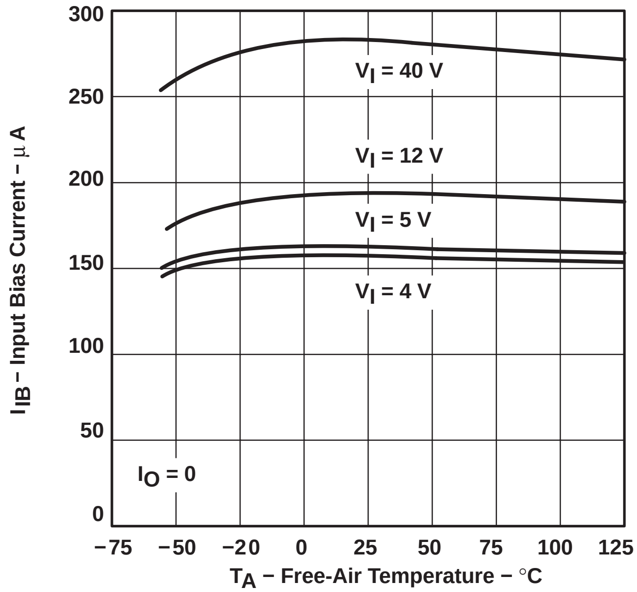

Figure 6

OUTPUT VOLTAGE REGULATION
vs
OUTPUT CURRENT

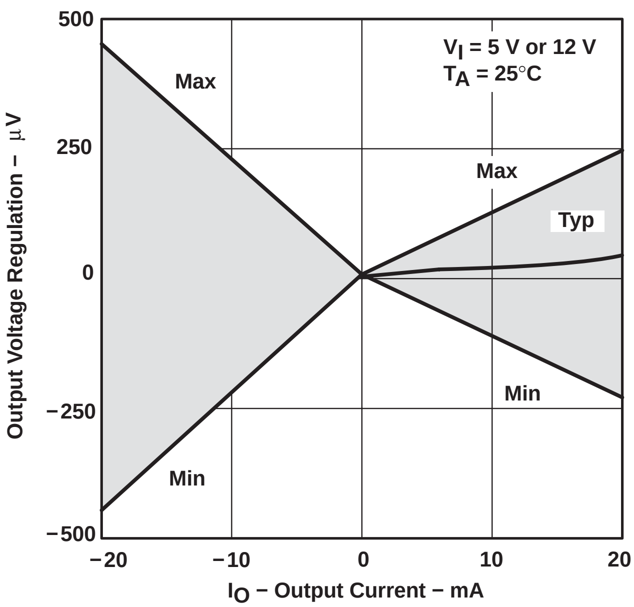

Figure 7

OUTPUT IMPEDANCE
vs
FREQUENCY

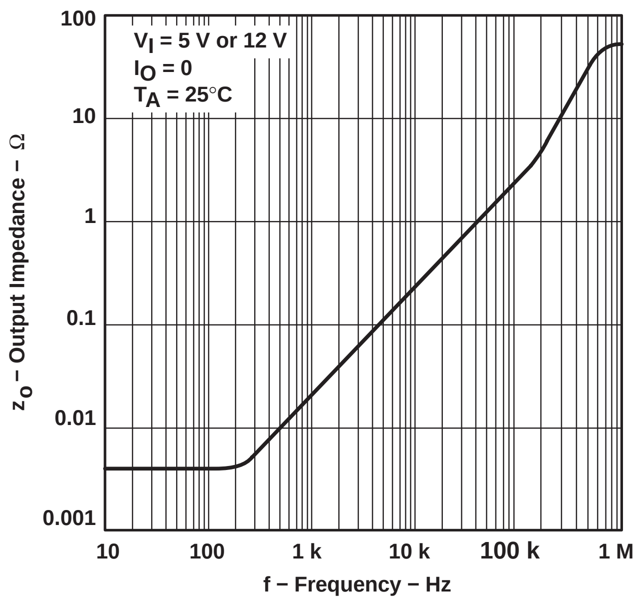

Figure 8

† Data at high and low temperatures are applicable within the rated operating free-air temperature ranges of the various devices.

TYPICAL CHARACTERISTICS†

SHORT-CIRCUIT OUTPUT CURRENT vs INPUT VOLTAGE

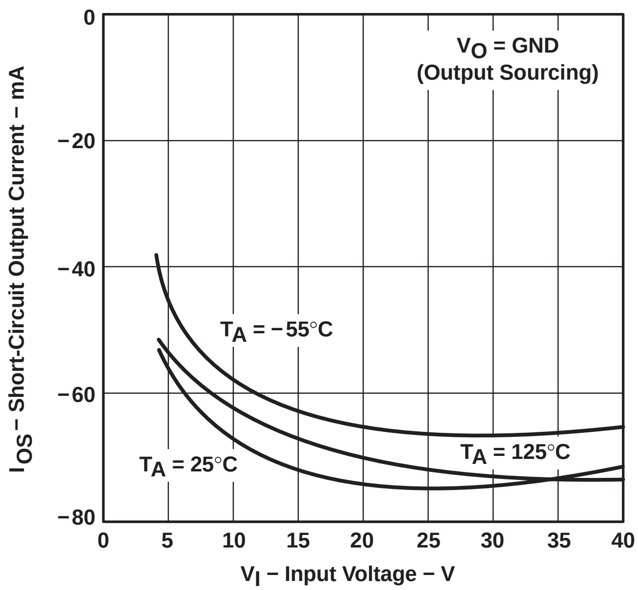

Figure 9

SHORT-CIRCUIT OUTPUT CURRENT vs INPUT VOLTAGE

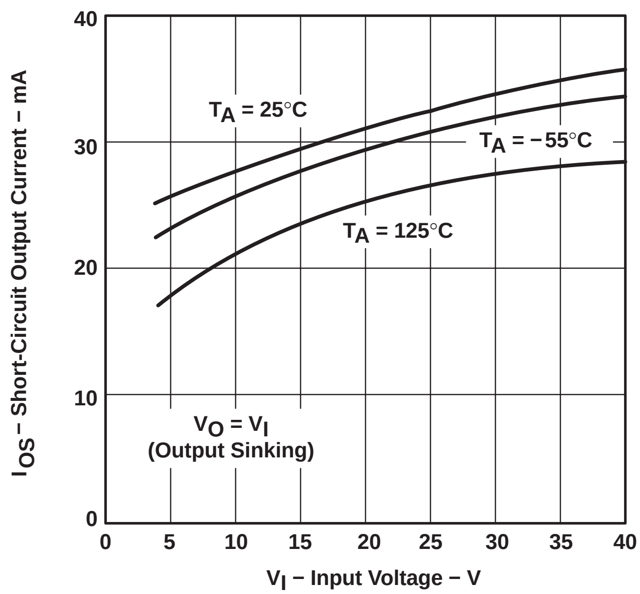

Figure 10

SHORT-CIRCUIT OUTPUT CURRENT vs FREE-AIR TEMPERATURE

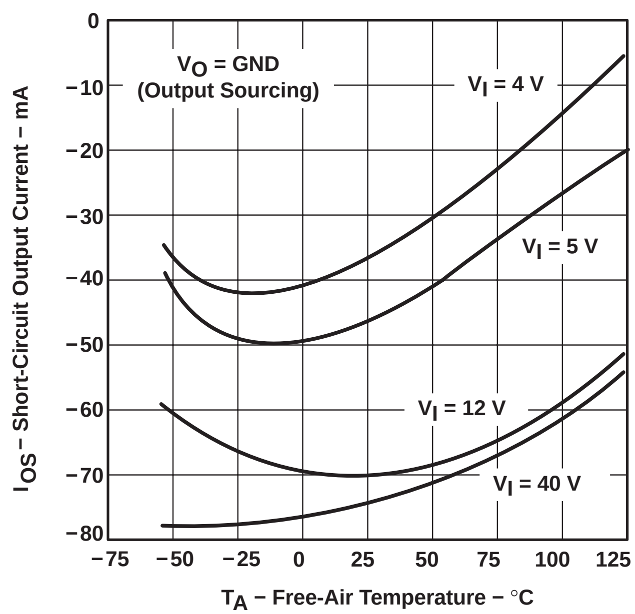

Figure 11

SHORT-CIRCUIT OUTPUT CURRENT vs FREE-AIR TEMPERATURE

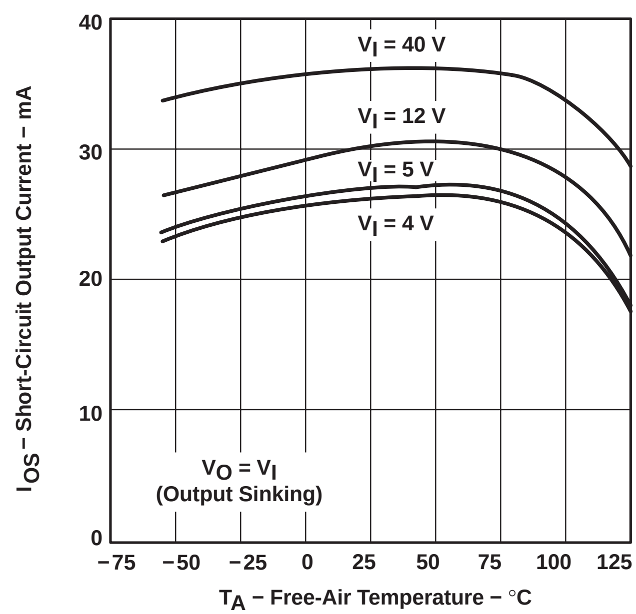

Figure 12

† Data at high and low temperatures are applicable within the rated operating free-air temperature ranges of the various devices.

TYPICAL CHARACTERISTICS

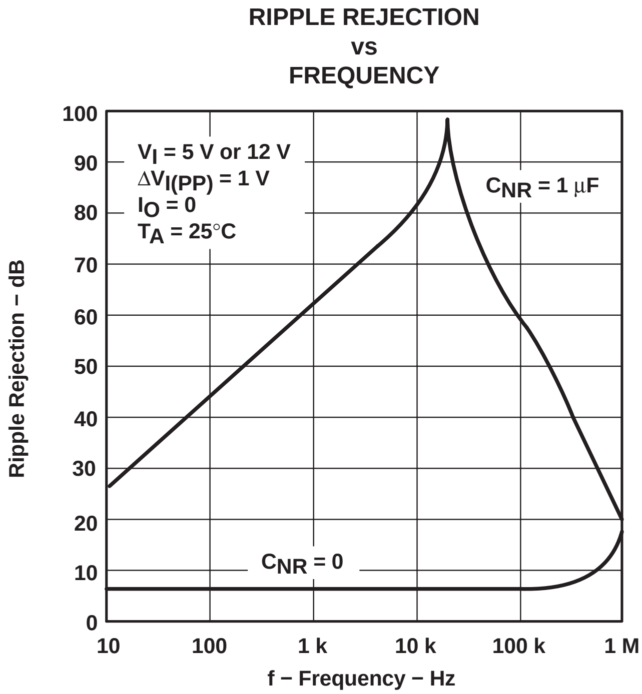

Figure 13

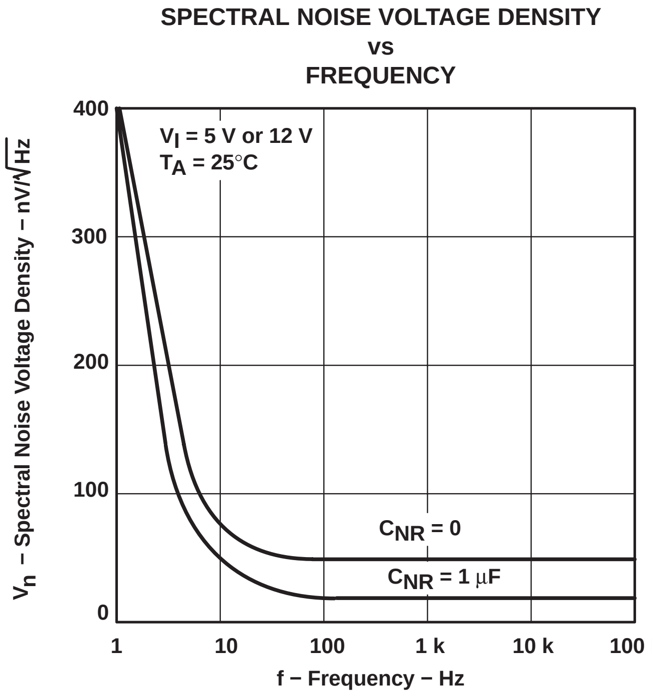

Figure 14

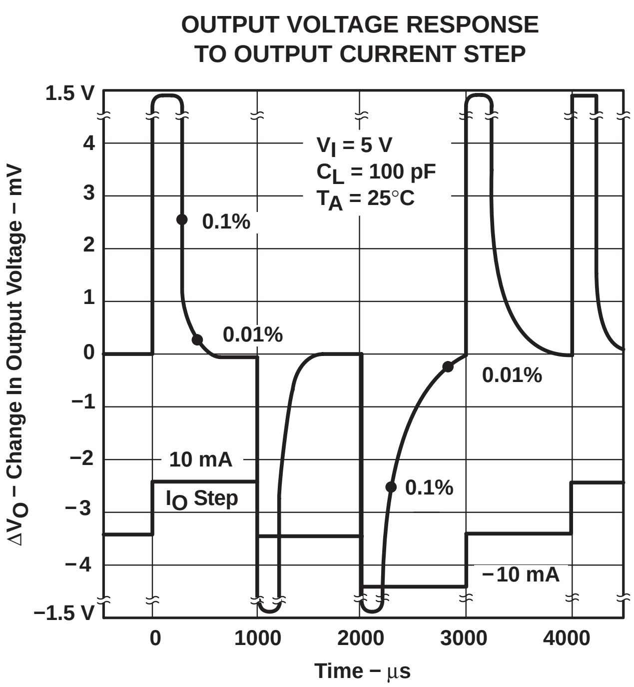

Figure 15

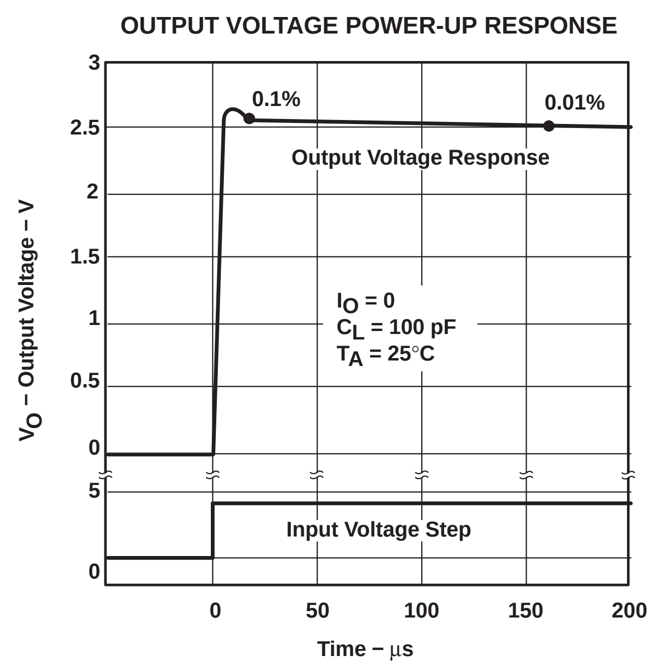

Figure 16

TYPICAL CHARACTERISTICS

STABILITY RANGE
OUTPUT CURRENT
vs
LOAD CAPACITANCE

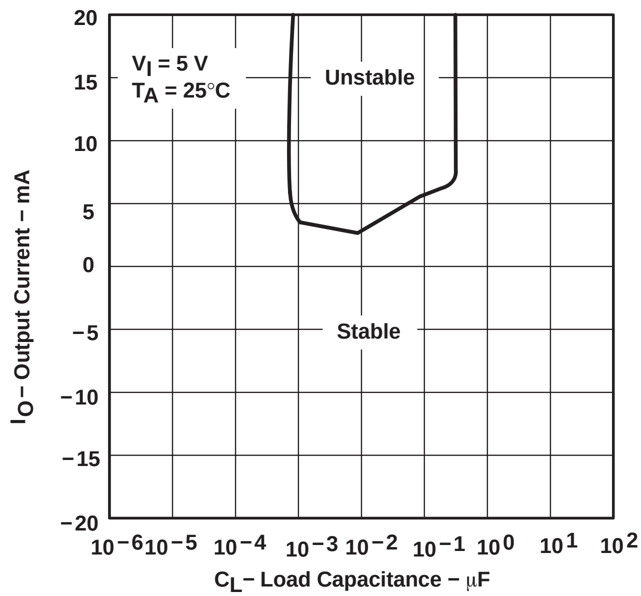

Figure 17

MACROMODEL INFORMATION

```
*   TLE2426 OPERATIONAL AMPLIFIER “MACROMODEL” SUBCIRCUIT
*   CREATED USING PARTS RELEASE 4.03 0N 08/21/90 AT 13:51
*   REV (N/A)     SUPPLY VOLTAGE: 5 V
*   CONNECTIONS:      FILTER
                      |   INPUT
*                     |   |   COMMON
*                     |   |   |   OUTPUT
*                     |   |   |   |
.SUBCKT TLE2426       1   3   4   5
```

```
   C1     11  12  21.66E-12
   C2      6   7  30.00E-12
   C3     87   0  10.64E-9
   CPSR   85  86  15.9E-9
   DCM+   81  82  DX
   DCM-   83  81  DX
   DC      5  53  DX
   DE     54   5  DX
   DLP    90  91  DX
   DLN    92  90  DX
   DP      4   3  DX
   ECMR   84  99  (2,99) 1
   EGND   99   0  POLY(2)   (3,0) (4,0)   0   .5 .5
   EPSR   85   0  POLY(1)   (3,4)  -16.22E-6 3.24E-6
   ENSE   89   2  POLY(1)   (88,0) 120E-6 1
   FB      7  99  POLY(6)   VB  VC  VE  VLP VLN VPSR 0 74.8E6 -10E6  10E6   10E6   -10E6  74E6
   GA      6   0  11  12  320.4E-6
   GCM     0   6  10  99  1.013E-9
   GPSR   85  86  (85,86)   100E-6
   GRC1    4  11  (4,11) 3.204E-4
   GRC2    4  12  (4,12) 3.204E-4
   GRE1   13  10  (13,10)   1.038E-3
   GRE2   14  10  (14,10)   1.038E-3
   HLIM   90   0  VLIM   1K
   HCMR   80   1  POLY(2)   VCM+   VCM-   0   1E2    1E2
   IRP     3   4  146E-6
   IEE     3  10  DC 24.05E-6
   IIO     2   0  .2E-9
   I1     88   0  1E-21
   Q1     11  89  13  QX
   Q2     12  80  14  QX
   R2      6   9  100.0E3
   RCM    84  81  1K
   REE    10  99   8.316E6
   RN1    87   0   2.55E8
   RN2    87  88  11.67E3
   RO1     8   5  63
   RO2     7  99  62
   VCM+   82  99  1.0
   VCM-   83  99  -2.3
   VB      9   0  DC  0
   VC      3  53  DC  1.400
   VE     54   4  DC  1.400
   VLIM    7   8  DC  0
   VLP    91   0  DC  30
   VLN     0  92  DC  30
   VPSR    0  86  DC  0
   RFB     5   2  1K
   RIN1    3   1  220K
   RIN2    1   4  220K
.MODEL DX  D(IS=800.OE-18)
.MODEL QX  PNP(IS=800.OE-18 BF=480)
.ENDS
```

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
5962-9555602Q2A	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI
5962-9555602QPA	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI
TLE2426CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426CLP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426CLPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426CLPR	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426CLPRE3	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426CP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
TLE2426CPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
TLE2426ID	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426IDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426IDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426IDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426ILP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426ILPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426ILPR	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426ILPRE3	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type
TLE2426IP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
TLE2426IPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
TLE2426MD	ACTIVE	SOIC	D	8	75	TBD	CU NIPDAU	Level-1-220C-UNLIM
TLE2426MDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TLE2426MFKB	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI
TLE2426MJGB	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI
TLE2426MLP	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
TLE2426MP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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OTHER QUALIFIED VERSIONS OF TLE2426 :

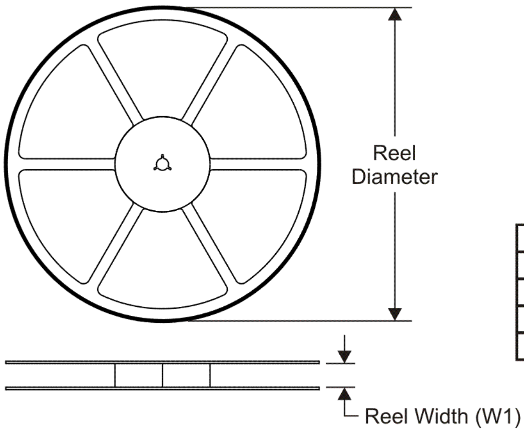
- Automotive: TLE2426-Q1
- Enhanced Product: TLE2426-EP

NOTE: Qualified Version Definitions:

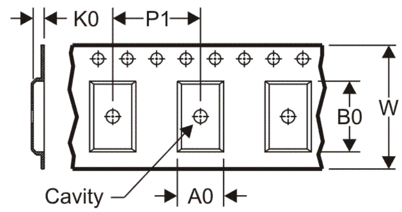
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

TAPE AND REEL INFORMATION

REEL DIMENSIONS

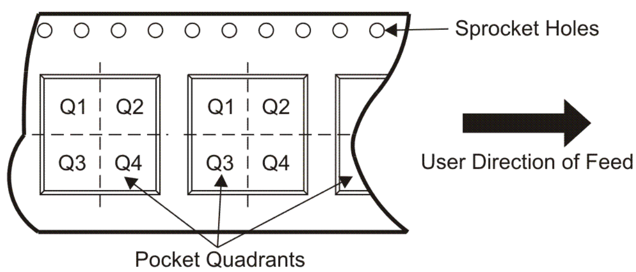


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

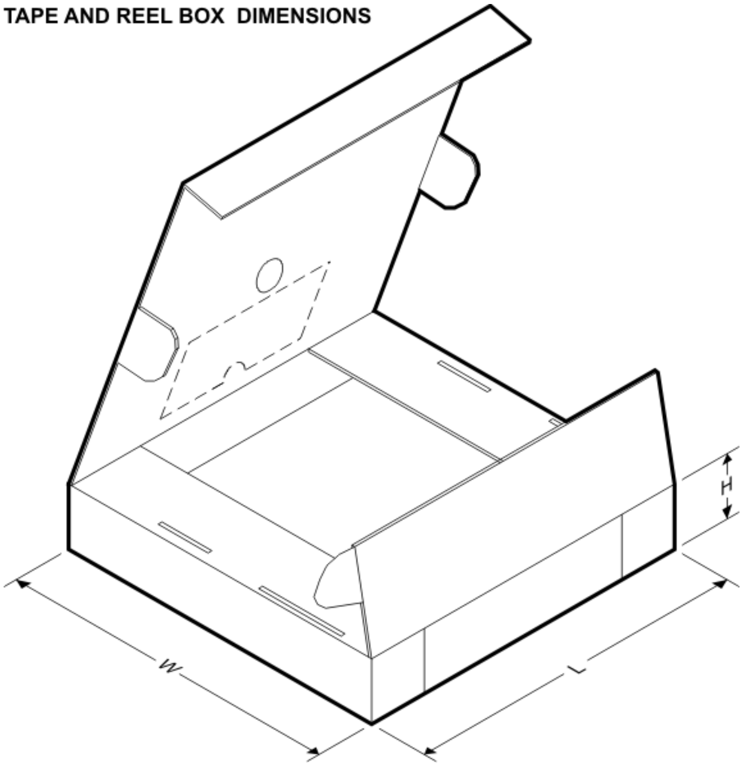
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TLE2426CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TLE2426IDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1

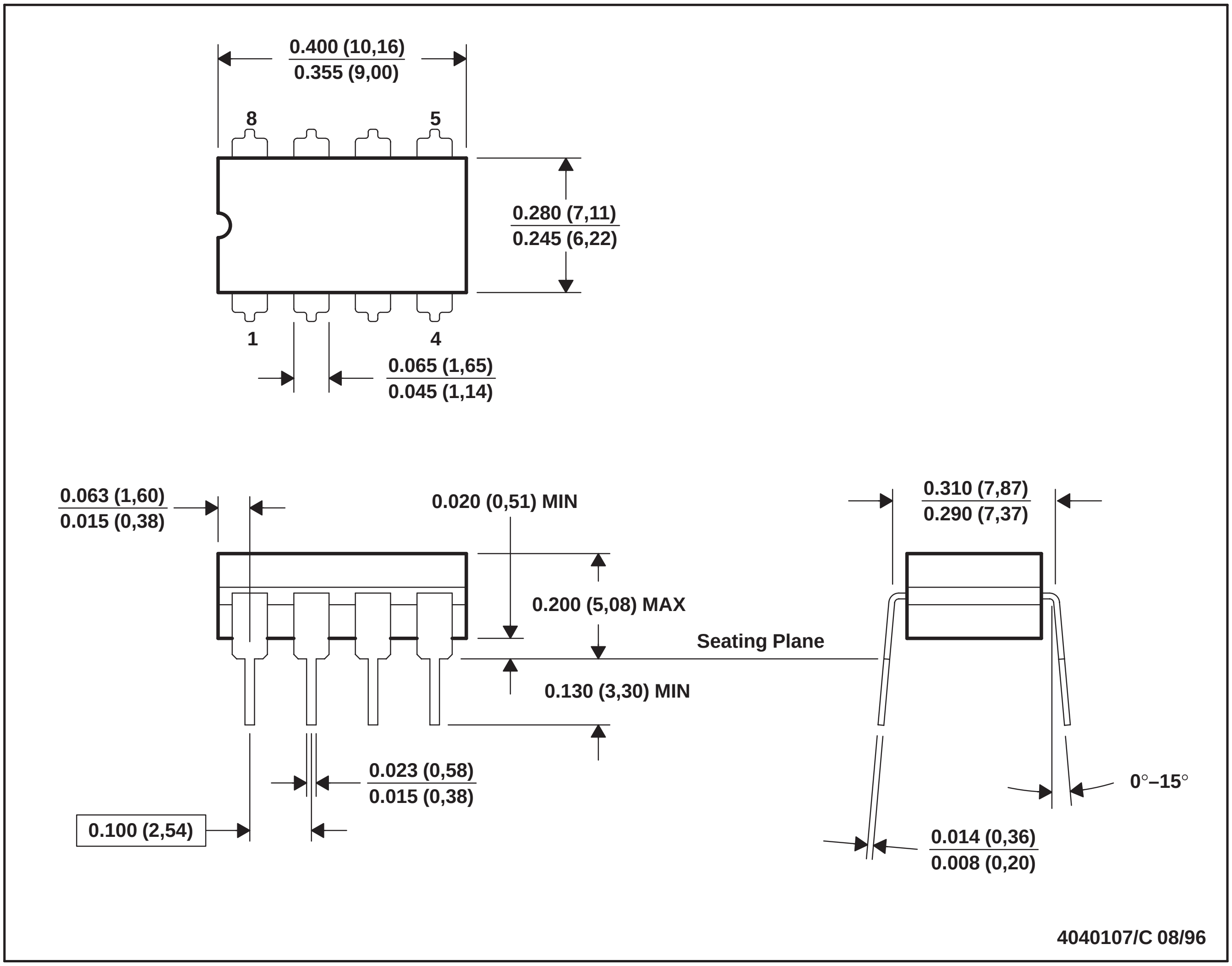
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TLE2426CDR	SOIC	D	8	2500	346.0	346.0	29.0
TLE2426IDR	SOIC	D	8	2500	346.0	346.0	29.0

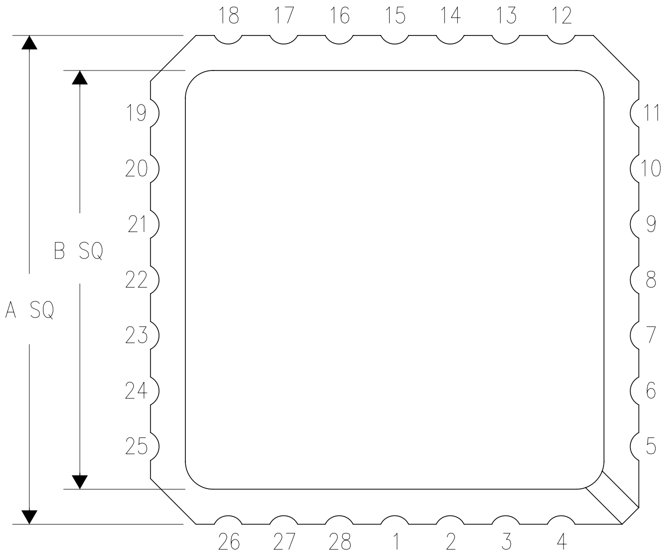
JG (R-GDIP-T8) **CERAMIC DUAL-IN-LINE**



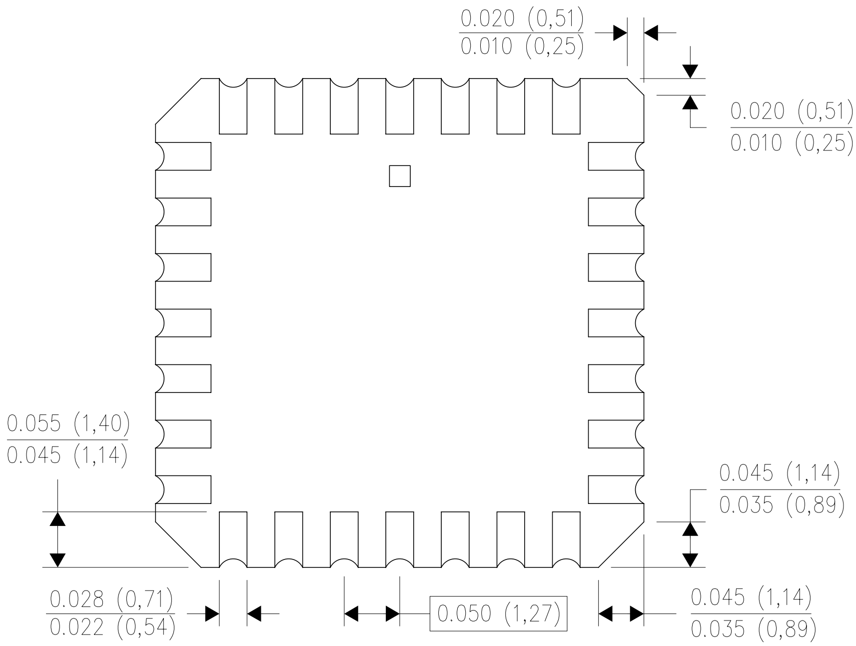
NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification.
- E. Falls within MIL STD 1835 GDIP1-T8

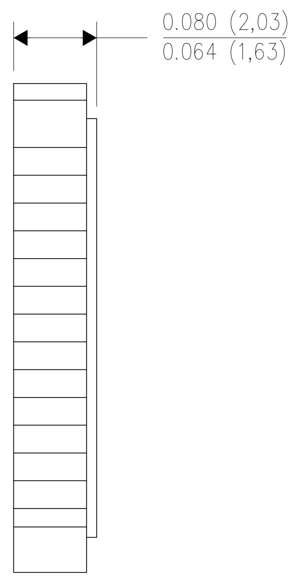
FK (S-CQCC-N**) LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



NO. OF TERMINALS **	A		B	
	MIN	MAX	MIN	MAX
20	0.342 (8,69)	0.358 (9,09)	0.307 (7,80)	0.358 (9,09)
28	0.442 (11,23)	0.458 (11,63)	0.406 (10,31)	0.458 (11,63)
44	0.640 (16,26)	0.660 (16,76)	0.495 (12,58)	0.560 (14,22)
52	0.740 (18,78)	0.761 (19,32)	0.495 (12,58)	0.560 (14,22)
68	0.938 (23,83)	0.962 (24,43)	0.850 (21,6)	0.858 (21,8)
84	1.141 (28,99)	1.165 (29,59)	1.047 (26,6)	1.063 (27,0)

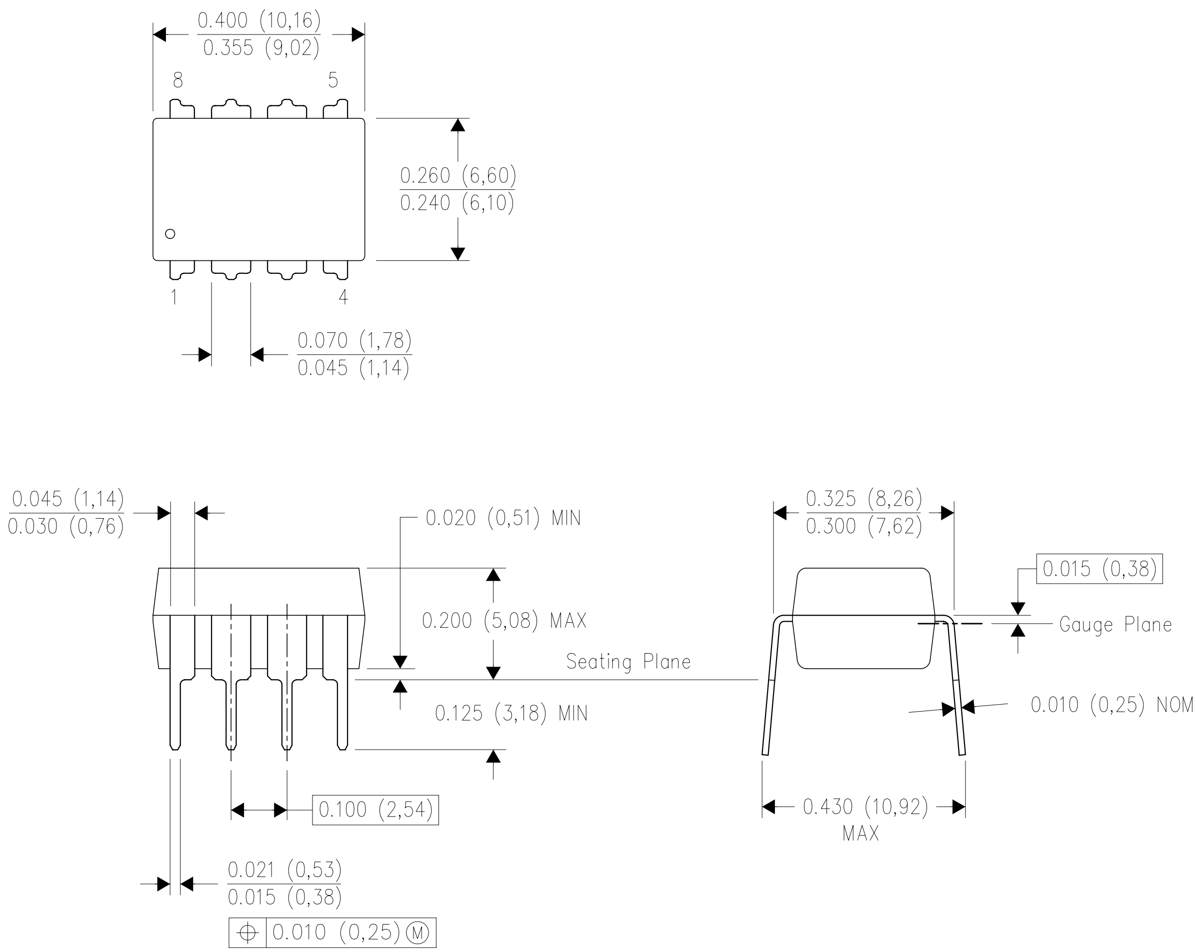




4040140/D 01/11

NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a metal lid.
- D. Falls within JEDEC MS-004

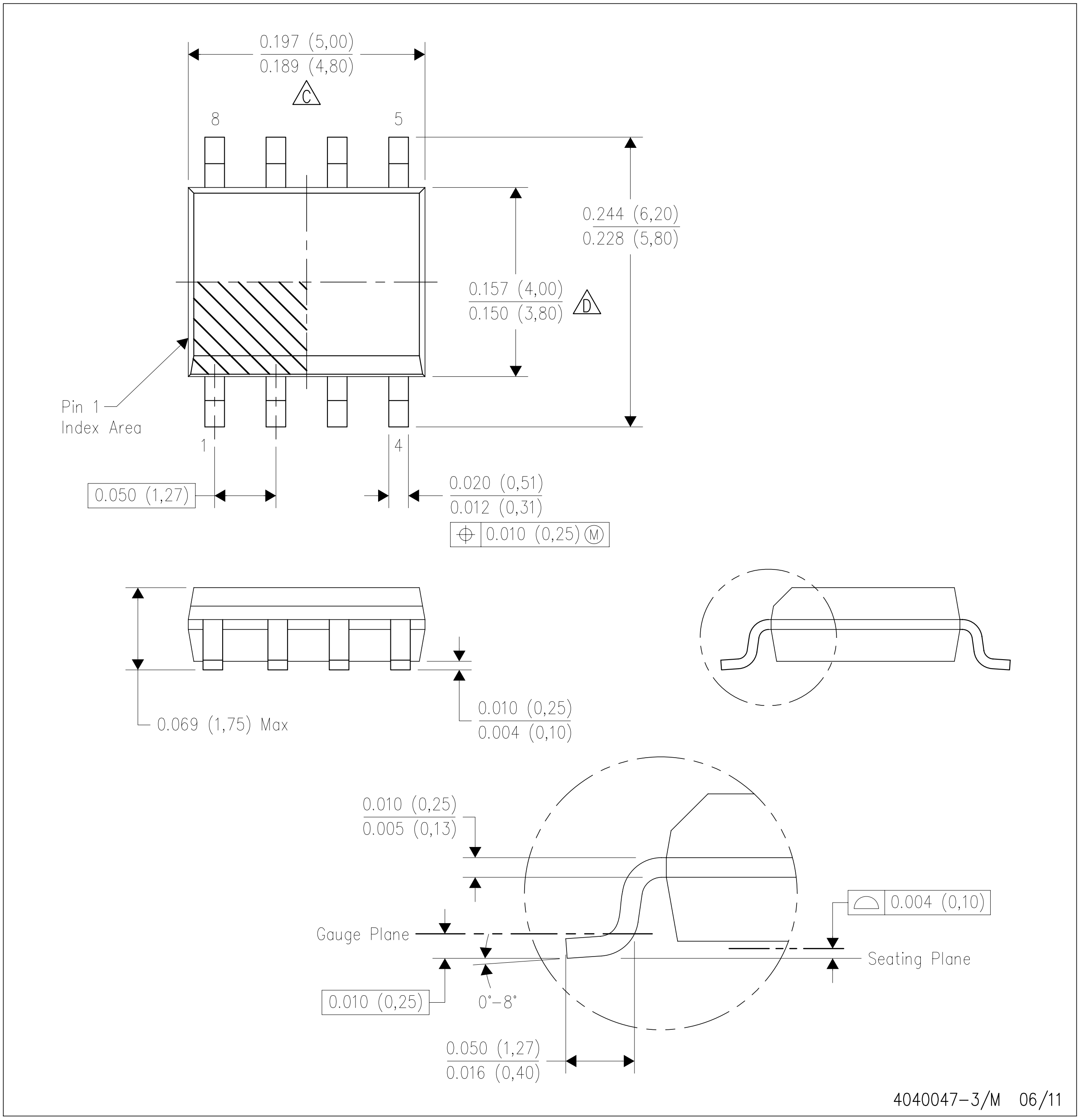
P (R–PDIP–T8) PLASTIC DUAL–IN–LINE PACKAGE



4040082/E 04/2010

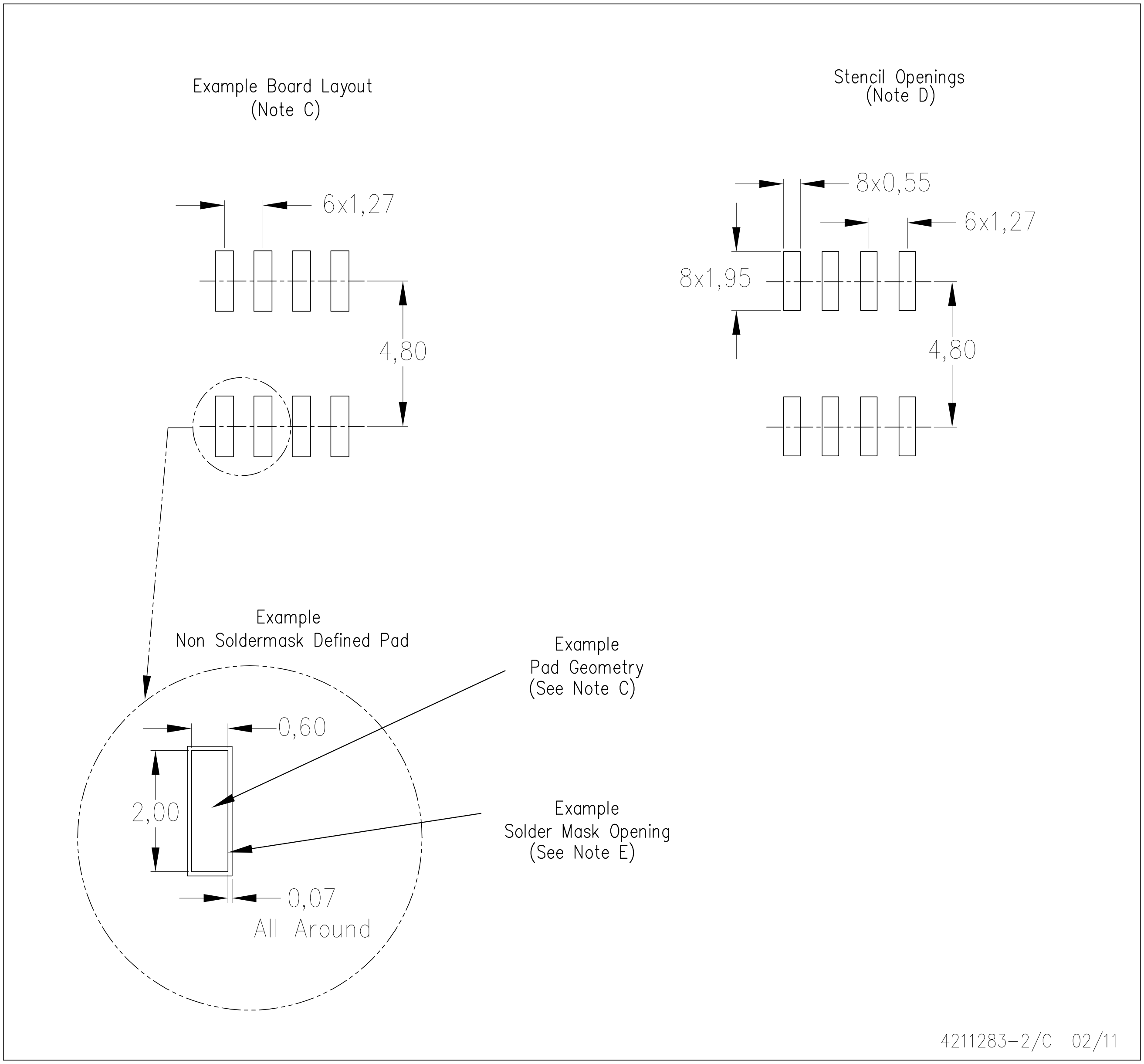
NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001 variation BA.

D (R–PDSO–G8) PLASTIC SMALL OUTLINE



NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AA.

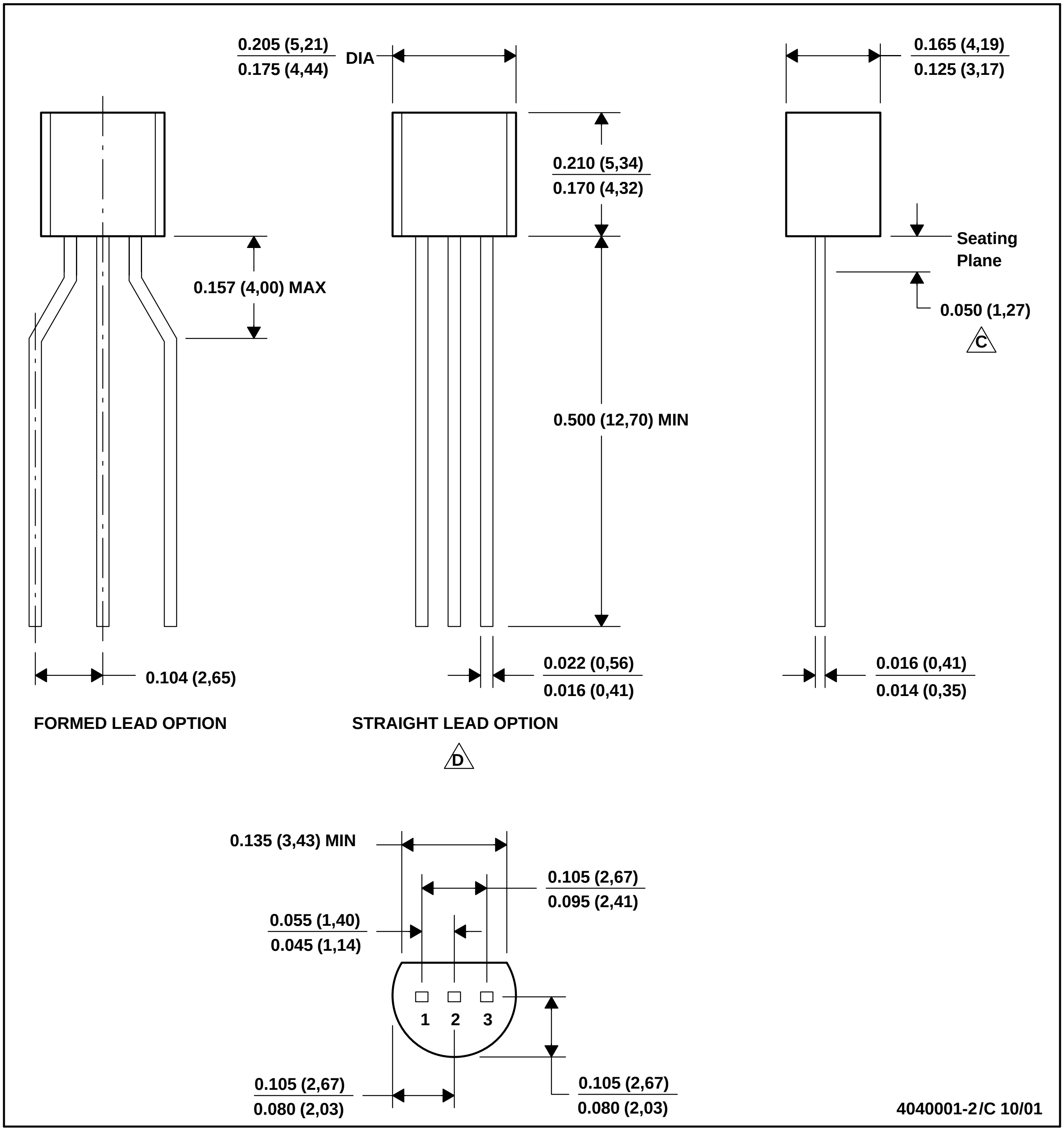
D (R-PDSO-G8) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC-7351 is recommended for alternate designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

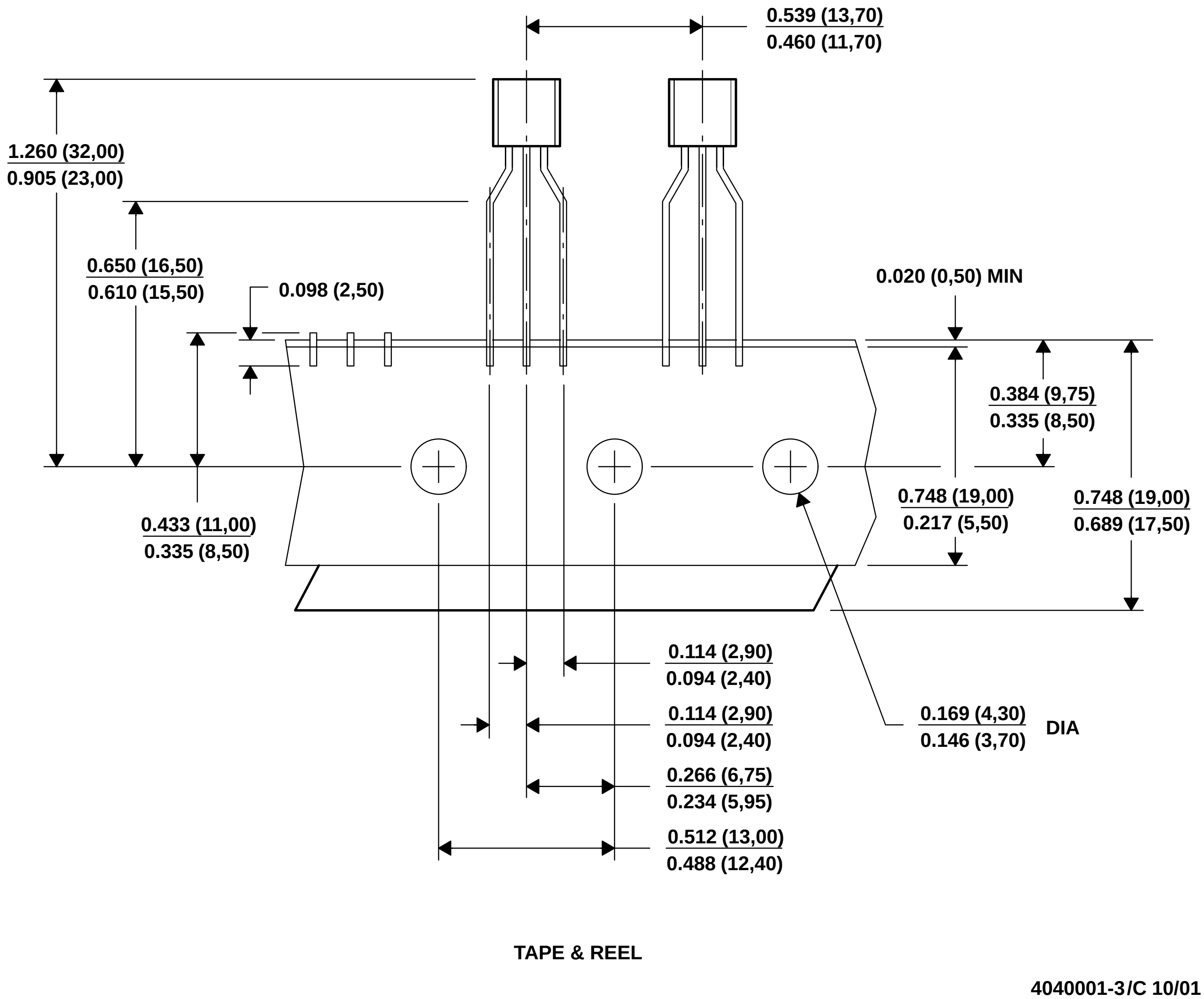
MSOT002A – OCTOBER 1994 – REVISED NOVEMBER 2001

LP (O-PBCY-W3) **PLASTIC CYLINDRICAL PACKAGE**



NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Lead dimensions are not controlled within this area
- D. FAlls within JEDEC TO -226 Variation AA (TO-226 replaces TO-92)
- E. Shipping Method:
  - Straight lead option available in bulk pack only.
  - Formed lead option available in tape & reel or ammo pack.

LP (O-PBCY-W3) **PLASTIC CYLINDRICAL PACKAGE**



NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Tape and Reel information for the Format Lead Option package.

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