- Ultra-Fast Operation . . . 10 ns (typ)
- Low Positive Supply Current 12.7 mA (Typ)
- Operates From a Single 5-V Supply or From a Split ±5-V Supply
- Complementary Outputs
- Input Common-Mode Voltage Includes Negative Rail
- Low Offset Voltage
- No Minimum Slew Rate Requirement
- Output Latch Capability
- Functional Replacement to the LT1116

#### description

The TL3116 is an ultra-fast comparator designed to interface directly to TTL logic while operating from either a single 5-V power supply or dual ±5-V supplies. The input common-mode voltage extends to the negative rail for ground sensing applications. It features extremely tight offset voltage and high gain for precision applications. It has complementary outputs that can be latched using the LATCH ENABLE terminal. Figure 1 shows the positive supply current of the comparator. The TL3116 only requires 12.7 mA (typical) to achieve a propagation delay of 10 ns.

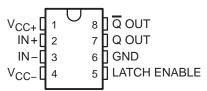
The TL3116 is a pin-for-pin functional replacement for the LT1116 comparator, offering high-speed operation but consuming much less power.

#### **AVAILABLE OPTIONS**

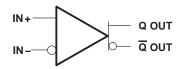
	PACKAGED	0.115	
TA	SMALL OUTLINE† (D)	TSSOP (PW)	CHIP FORM <sup>‡</sup> (Y)
0°C to 70°C	TL3116CD	TL3116CPWLE	TL3116Y
-40°C to 85°C	TL3116ID	TL3116IPWLE	_

<sup>†</sup>The PW packages are available left-ended taped and reeled only.

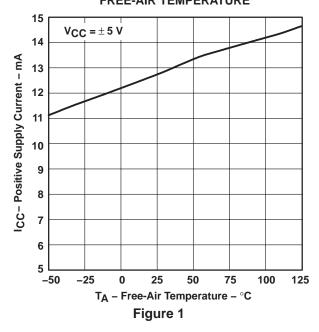
#### D AND PW PACKAGE (TOP VIEW)



#### symbol (each comparator)



# POSITIVE SUPPLY CURRENT vs FREE-AIR TEMPERATURE





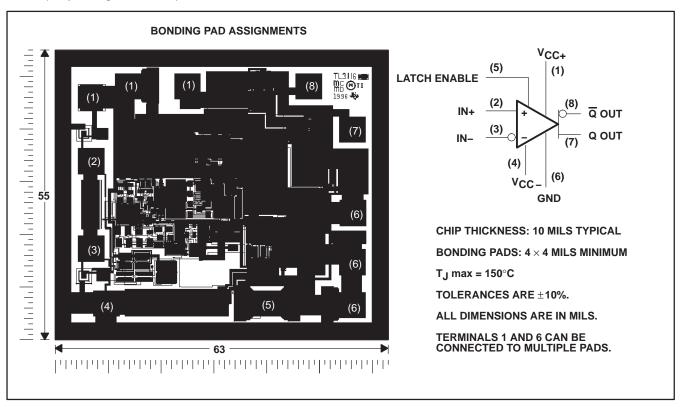
Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



<sup>‡</sup> Chip forms are tested at  $T_A = 25$ °C only.

#### **TL3116Y chip information**

This chip, when properly assembled, displays characteristics similar to the TL3116C. Thermal compression or ultrasonic bonding may be used on the doped-aluminum bonding pads. Chips may be mounted with conductive epoxy or a gold-silicon preform.



COMPONENT COUNT							
Bipolars	53						
MOSFETs	49						
Resistors	46						
Capacitors	14						



# TL3116, TL3116Y ULTRA-FAST LOW-POWER PRECISION COMPARATORS

SLCS132C - MARCH 1997 - REVISED MAY 1997

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

Supply voltage, V <sub>DD</sub> (see Note 1)	
Differential input voltage, V <sub>ID</sub> (see Note 2)	
Input voltage range, V <sub>I</sub>	
Input voltage, V <sub>I</sub> (LATCH ENABLE)	
Output current, I <sub>O</sub>	± 20 mA
Continuous total power dissipation	See Dissipation Rating Table
Operating free-air temperature range, T <sub>A</sub>	–40°C to 85°C
Storage temperature range, T <sub>stq</sub>	– 65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	

NOTES: 1. All voltage values, except differential voltages, are with respect to network ground.

2. Differential voltages are at IN+ with respect to IN-.

#### **DISSIPATION RATING TABLE**

PACKAGE	T <sub>A</sub> ≤ 25°C POWER RATING	DERATING FACTOR ABOVE T <sub>A</sub> = 25°C	T <sub>A</sub> = 70°C POWER RATING
D	725 mW	5.8 mW/°C	464 mW
PW	525 mW	4.2 mW/°C	336 mW



<sup>†</sup> 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.

# TL3116, TL3116Y ULTRA-FAST LOW-POWER PRECISION COMPARATORS

SLCS132C - MARCH 1997 - REVISED MAY 1997

#### electrical characteristics at specified operating free-air temperature, $V_{DD}$ = $\pm 5$ V, $V_{LE}$ = 0 (unless otherwise noted)

242445752	TEST SOUDITIONS!		TL3116C	;		LINUT		
PARAMETER	TEST CONDITIONS!	MIN	TYP‡	MAX	MIN	TYP‡	MAX	UNIT
lanut effect veltere	T <sub>A</sub> = 25°C		0.5	3		0.5	3	mV
input offset voltage	T <sub>A</sub> = full range			3.5			3.5	mv
Temperature coefficient of input offset voltage			-2.5			-2.8		μV/°C
	T <sub>A</sub> = 25°C		0.1	0.2		0.1	0.2	
Input offset current	T <sub>A</sub> = full range			0.3			0.35	μΑ
January I. Community	T <sub>A</sub> = 25°C		0.7	1.1		0.7	1.1	
input bias current	T <sub>A</sub> = full range			1.2			1.5	μΑ
Common-mode input	V <sub>DD</sub> = ±5 V	-5		2.5	-5		2.5	.,
voltage range	V <sub>DD</sub> = 5 V	0		2.5	0		2.5	V
Common-mode rejection ratio	-5 ≤ V <sub>IC</sub> ≤ 2.5 V	75	100		75	100		dB
Supply-voltage rejection ratio	Positive supply: $4.6 \text{ V} \le +\text{V}_{DD} \le 5.4 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	60	80		60	80		
	Negative supply: $-7 \text{ V} \le -\text{V}_{DD} \le -2 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	80	100		80	100		dB
Laveland autout valtage	$I_{(Sink)} = 4 \text{ mA},$ V+ $\leq 4.6 \text{ V},$ $T_A = 25^{\circ}\text{C}$		400	600		400	600	\/
Low-level output voltage	$\begin{split} I_{\mbox{(sink)}} &= 10 \mbox{ mA}, & \mbox{V+} \leq 4.6 \mbox{ V}, \\ T_{\mbox{A}} &= 25^{\circ} \mbox{C} \end{split}$		750			750		mV
High lavel output vales	$V+ \leq 4.6 \text{ V}, \\ T_A = 25^{\circ}\text{C}$ $I_O = 1 \text{ mA},$	3.6	3.9		3.6	3.9		V
nign-ievei output voitage	$V+ \leq 4.6 \ V, \\ T_{\mbox{\scriptsize A}} = 25 \mbox{\rm °C} \label{eq:total_obj}$	3.4	3.8		3.4	3.8		V
Positive supply current	T full recens		12.7	14.7		12.7	15	A
Negative supply current	TA = ruii range	-2.6			-3			mA
Low-level input voltage (LATCH ENABLE)				0.8			0.8	V
High-level input voltage (LATCH ENABLE)		2			2			V
Low-level input current	V <sub>LE</sub> = 0		0	1		0	1	μΑ
(LATCH ENABLE)	V <sub>LE</sub> = 2 V		24	39		24	45	μΑ
	of input offset voltage  Input offset current  Input bias current  Common-mode input voltage range  Common-mode rejection ratio  Supply-voltage rejection ratio  Low-level output voltage  Positive supply current  Negative supply current  Low-level input voltage  (LATCH ENABLE)  Low-level input current	$ \begin{array}{c} \text{Input offset voltage} & \begin{array}{c} T_{A} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \end{array} \\ \hline \text{Temperature coefficient of input offset voltage} \\ \hline \text{Input offset current} & \begin{array}{c} T_{A} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \end{array} \\ \hline \text{Input offset current} & \begin{array}{c} T_{A} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \end{array} \\ \hline \text{Input bias current} & \begin{array}{c} T_{A} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \end{array} \\ \hline \text{Common-mode input voltage range} & \begin{array}{c} V_{DD} = \pm 5 \text{ V} \\ V_{DD} = 5 \text{ V} \end{array} \\ \hline \text{Common-mode rejection ratio} & \begin{array}{c} -5 \leq \text{V}_{ C} \leq 2.5 \text{ V} \\ \hline \text{Positive supply: } 4.6 \text{ V} \leq +\text{V}_{DD} \leq 5.4 \text{ V}, \\ T_{A} = 25^{\circ}\text{C} \\ \hline \text{Negative supply: } -7 \text{ V} \leq -\text{V}_{DD} \leq -2 \text{ V}, \\ T_{A} = 25^{\circ}\text{C} \\ \hline \text{I(sink)} = 4 \text{ mA}, & \text{V+} \leq 4.6 \text{ V}, \\ T_{A} = 25^{\circ}\text{C} \\ \hline \text{I(sink)} = 10 \text{ mA}, & \text{V+} \leq 4.6 \text{ V}, \\ T_{A} = 25^{\circ}\text{C} \\ \hline \end{array} \\ \hline \text{I(sink)} = 10 \text{ mA}, & \text{V+} \leq 4.6 \text{ V}, \\ T_{A} = 25^{\circ}\text{C} \\ \hline \end{array}$ $\begin{array}{c} \text{Positive supply current} \\ \text{Negative supply current} \\ \hline \text{Negative supply current} \\ \hline \text{Low-level input voltage} \\ \hline \text{(LATCH ENABLE)} \\ \hline \end{array} \\ \begin{array}{c} \text{Low-level input current} \\ \hline \end{array} \\ \begin{array}{c} \text{VLE = 0} \\ \hline \end{array}$	$ \begin{array}{c} \text{Input offset voltage} \\ \text{Ta} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \\ \\ \text{Input offset current} \\ \\ \text{Input offset current} \\ \\ \text{Input offset current} \\ \\ \text{Input bias current} \\ \\ \text{Input bias current} \\ \\ \text{Input bias current} \\ \\ \text{Ta} = 25^{\circ}\text{C} \\ \hline T_{A} = \text{full range} \\ \\ \text{Common-mode input voltage range} \\ \\ \text{Common-mode rejection ratio} \\ \\ \text{Common-mode rejection ratio} \\ \\ \text{Supply-voltage rejection ratio} \\ \\ \text{Supply-voltage rejection ratio} \\ \\ \text{Do Supply-voltage supply: } -7 \text{ V} \leq -\text{V}_{DD} \leq 5.4 \text{ V}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{Negative supply: } -7 \text{ V} \leq -\text{V}_{DD} \leq -2 \text{ V}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{I(sink)} = 10 \text{ mA}, \qquad \text{V+} \leq 4.6 \text{ V}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V+} \leq 4.6 \text{ V}, \qquad \text{IO} = 1 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V+} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V+} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 5^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 5^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 5^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, } \\ \text{Ta} = 5^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, \\ \text{Ta} = 25^{\circ}\text{C} \\ \\ \text{V-} \leq 4.6 \text{ V}, \qquad \text{IO} = 10 \text{ mA}, \\ \text{Ta} = 100 \text{ mA}, \\ \text$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$

<sup>†</sup> Full range for the TL3116C is  $T_A = 0^{\circ}$ C to  $70^{\circ}$ C. Full range for the TL3116I is  $T_A = -40^{\circ}$ C to  $85^{\circ}$ C. ‡ All typical values are measures with  $T_A = 25^{\circ}$ C.



## switching characteristics, $V_{DD} = \pm 5 \text{ V}$ , $V_{LE} = 0$

DADAMETER		7507.001	TL3116C			TL3116I			LINUT	
	PARAMETER	TEST CON	MIN	TYP	MAX	MIN	TYP	MAX	UNIT	
	$\Delta V_{\parallel} = 100 \text{ mV},$	T <sub>A</sub> = 25°C		9.9	12		9.9	12		
	Para a radio a datas das at	$V_{OD} = 5 \text{ mV}$	T <sub>A</sub> = full range		9.9	14		9.9	15	
<sup>t</sup> pd1	Propagation delay time‡	$\Delta V_{j} = 100 \text{ mV},$	T <sub>A</sub> = 25°C		8.2	10.3		8.2	10.3	ns
		$V_{OD} = 20 \text{ mV}$	T <sub>A</sub> = full range		8.2	12.7		8.2	13.7	
t <sub>sk(p)</sub>	Pulse skew ( $ t_{pd+} - t_{pd-} $ )	$\Delta V_I = 100 \text{ mV},$ $T_A = 25^{\circ}\text{C}$	$V_{OD} = 5 \text{ mV},$		0.5			0.5		ns
t <sub>su</sub>	Setup time, LATCH ENABLE				3.4			3.4		ns

<sup>&</sup>lt;sup>†</sup> Full range for the TL3116C is 0°C to 70°C. Full range for the TL3116I is –40°C to 85°C.

#### **TYPICAL CHARACTERISTICS**

#### **Table of Graphs**

			FIGURE
		vs Input voltage	2
ICC	Positive supply current	vs Frequency	3
		vs Free-air temperature	4
ICC	Negative supply current	vs Free-air temperature	5
		vs Overdrive voltage	6
	Propagation delay time	vs Supply voltage	7
t <sub>pd</sub>		vs Input impedance	8
ļ ·		vs Load capacitance	9
		vs Free-air temperature	10
VIС	Common-mode input voltage	vs Free-air temperature	11
VIT	Input threshold voltage (LATCH ENABLE)	vs Free-air temperature	12
,,	0	vs Output source current	13
VO	Output voltage	vs Output sink current	14
lį	Input current (LATCH ENABLE)	vs Input voltage	15

<sup>‡</sup> t<sub>pd1</sub> cannot be measured in automatic handling equipment with low values of overdrive. The TL3116 is 100% tested with a 1-V step and 500-mV overdrive at T<sub>A</sub> = 25°C only. Correlation tests have shown that t<sub>pd1</sub> limits given can be ensured with this test, if additional dc tests are performed to ensure that all internal bias conditions are correct. For low overdrive conditions, V<sub>OS</sub> is added to the overdrive.

20

18

16

14

12

10

8

2

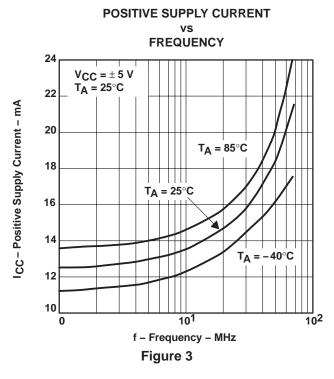
0

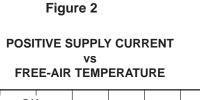
ICC - Positive Supply Current - mA

#### TYPICAL CHARACTERISTICS

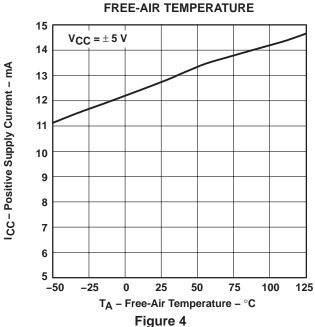
8

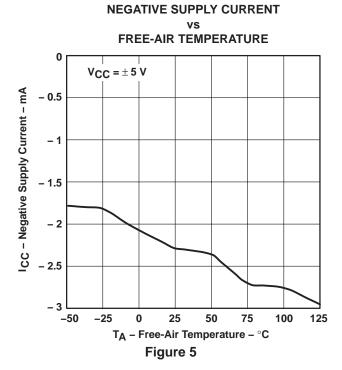
# **POSITIVE SUPPLY CURRENT INPUT VOLTAGE** $V_{CC} = \pm 5 V$ T<sub>A</sub> = 25°C T<sub>A</sub> = 85°C T<sub>A</sub> = 25°C $T_A = -40^{\circ}C$





V<sub>I</sub> - Input Voltage - V





#### **TYPICAL CHARACTERISTICS**

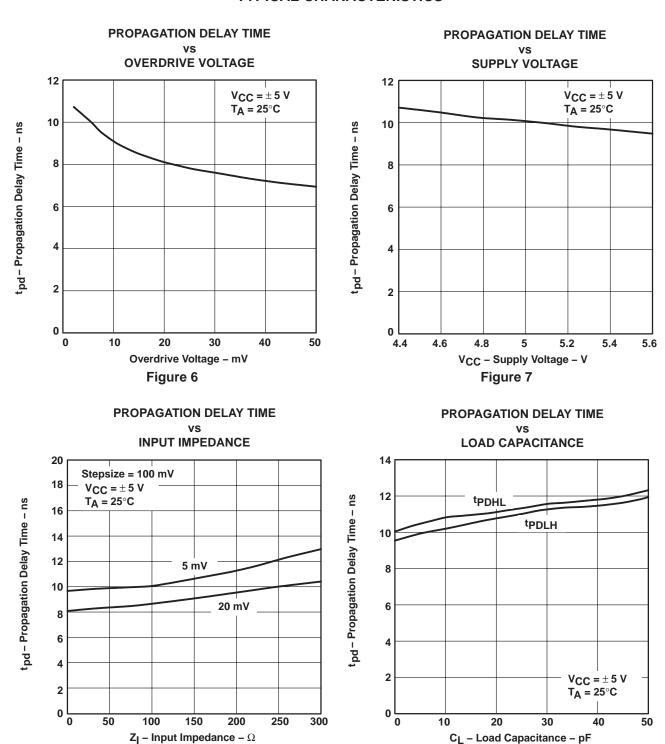


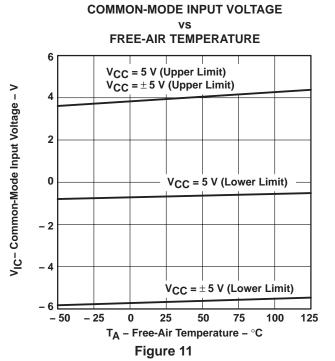


Figure 9

Figure 8

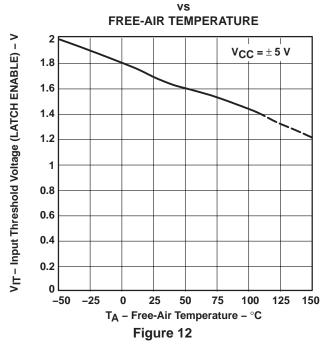
#### TYPICAL CHARACTERISTICS

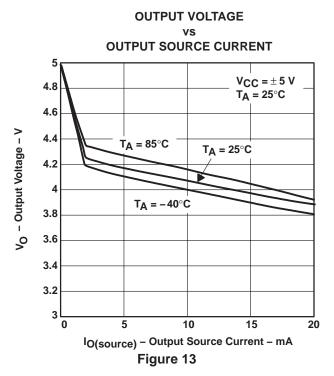
# **PROPAGATION DELAY TIME** FREE-AIR TEMPERATURE 25 $V_{CC} = \pm 5 V$ tpd - Propagation Delay Time - ns 20 15 Rising Edge 10 **Falling Edge** 5 75 100 125 - 50 - 25 50 T<sub>A</sub> - Free-Air Temperature - °C



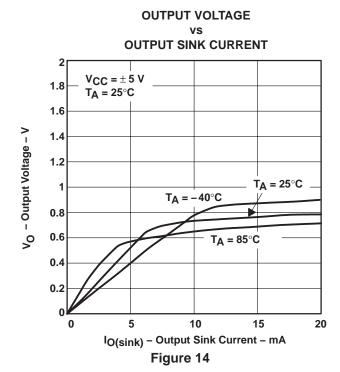
# INPUT THRESHOLD VOLTAGE (LATCH ENABLE)

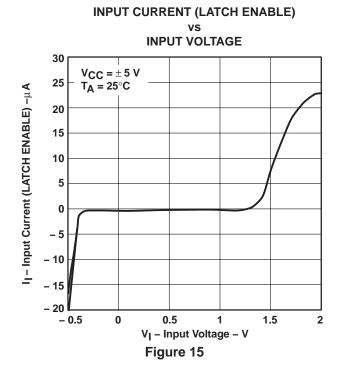
Figure 10





#### **TYPICAL CHARACTERISTICS**









10-Jun-2014

#### **PACKAGING INFORMATION**

Orderable Device		Package Type	Package Drawing	Pins	Package Qty		Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Samples
TL3116CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	(6) CU NIPDAU	(3) Level-1-260C-UNLIM	0 to 70	(4/5) 3116C	Samples
TL3116CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	3116C	Samples
TL3116CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	3116C	Samples
TL3116CPW	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	T3116	Samples
TL3116CPWLE	OBSOLETE	TSSOP	PW	8		TBD	Call TI	Call TI			
TL3116CPWR	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	T3116	Samples
TL3116ID	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	31161	Samples
TL3116IDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	31161	Samples
TL3116IDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	31161	Samples
TL3116IDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	31161	Samples
TL3116IPW	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	Z3116	Samples
TL3116IPWLE	OBSOLETE	TSSOP	PW	8		TBD	Call TI	Call TI			
TL3116IPWR	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	Z3116	Samples
TL3116IPWRG4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	Z3116	Samples

<sup>(1)</sup> 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.



#### PACKAGE OPTION ADDENDUM

10-Jun-2014

(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.
- (4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.
- (5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.
- (6) Lead/Ball Finish Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

**Important Information and Disclaimer:** The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

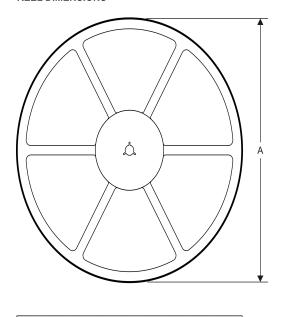
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

# PACKAGE MATERIALS INFORMATION

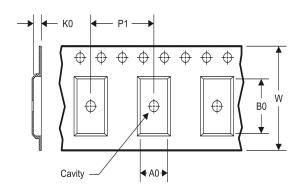
www.ti.com 14-Jul-2012

#### TAPE AND REEL INFORMATION

#### **REEL DIMENSIONS**



#### **TAPE DIMENSIONS**



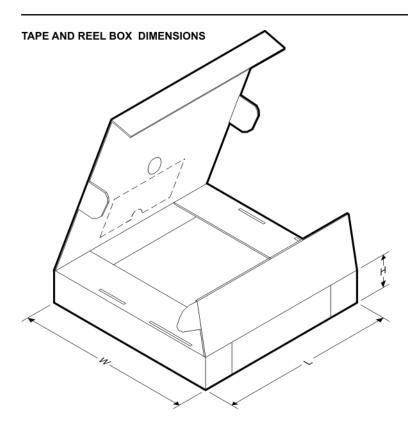
A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

#### TAPE AND REEL INFORMATION

\*All dimensions are nominal

Device		Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TL3116CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL3116CPWR	TSSOP	PW	8	2000	330.0	12.4	7.0	3.6	1.6	8.0	12.0	Q1
TL3116IDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL3116IPWR	TSSOP	PW	8	2000	330.0	12.4	7.0	3.6	1.6	8.0	12.0	Q1

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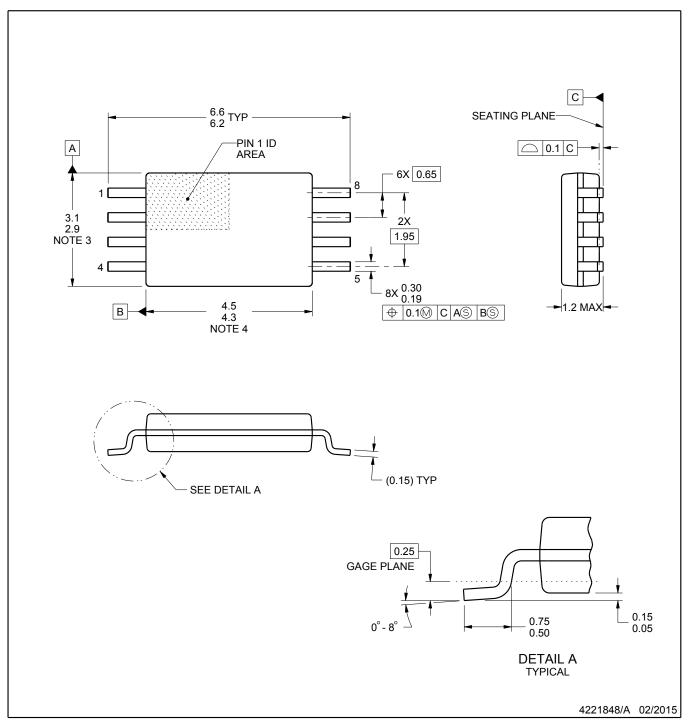


\*All dimensions are nominal

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Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TL3116CDR	SOIC	D	8	2500	367.0	367.0	35.0
TL3116CPWR	TSSOP	PW	8	2000	367.0	367.0	35.0
TL3116IDR	SOIC	D	8	2500	367.0	367.0	35.0
TL3116IPWR	TSSOP	PW	8	2000	367.0	367.0	35.0



SMALL OUTLINE PACKAGE



#### NOTES:

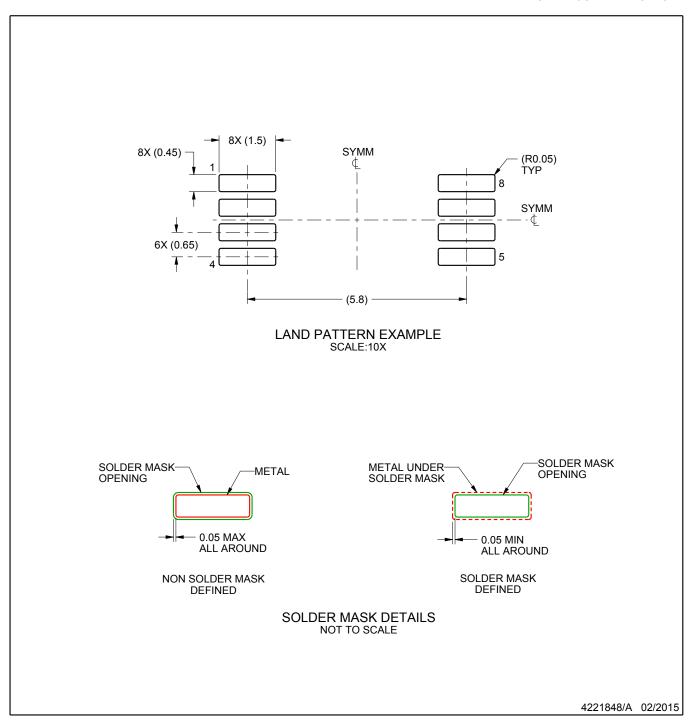
- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

  2. This drawing is subject to change without notice.

  3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm per side.
- 4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
- 5. Reference JEDEC registration MO-153, variation AA.



SMALL OUTLINE PACKAGE



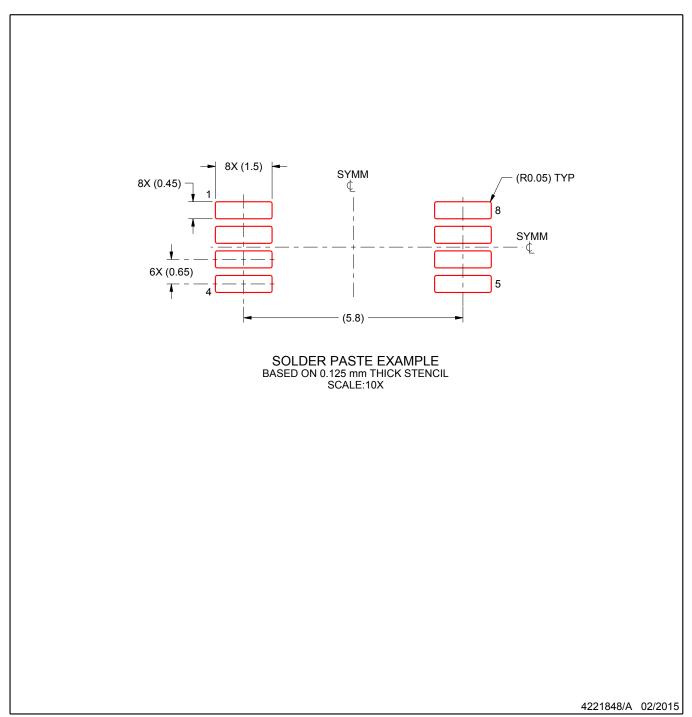
NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



SMALL OUTLINE PACKAGE



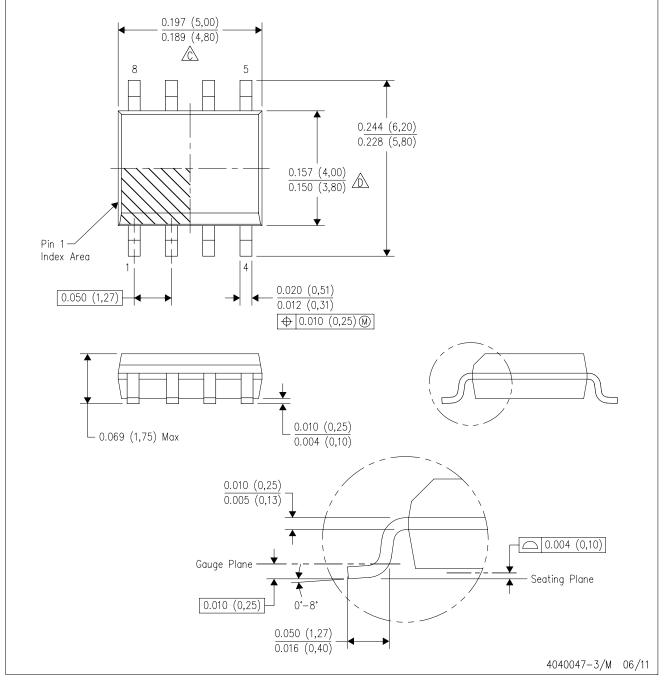
NOTES: (continued)

- 8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
- 9. Board assembly site may have different recommendations for stencil design.



# D (R-PDSO-G8)

#### PLASTIC SMALL OUTLINE



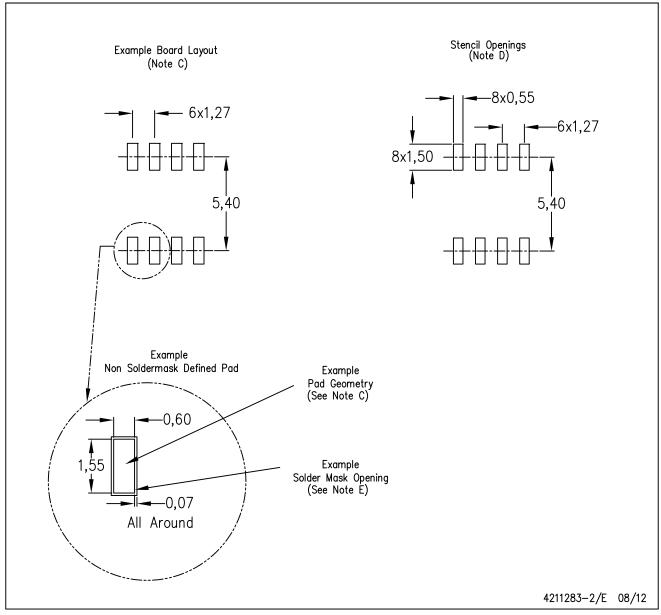
NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- 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.
- 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.



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