

## SN54HC04, SN74HC04

SCLS078F-DECEMBER 1982-REVISED AUGUST 2013

The 'HC04 devices contain six independent inverters.

They perform the Boolean function  $Y = \overline{A}$  in positive

6Y

NC

5A

NC

## **HEX INVERTERS**

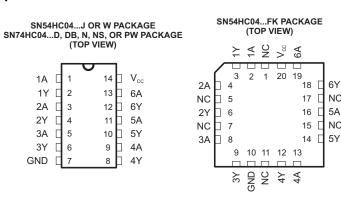
Check for Samples: SN54HC04, SN74HC04

logic.

### **FEATURES**

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- Wide Operating Voltage Range of 2 V to 6 V ٠
- **Outputs Can Drive Up To 10 LSTTL Loads**
- Low Power Consumption, 20-µA Max I<sub>CC</sub>
- Typical t<sub>pd</sub> = 8 ns
- ±4-mA Output Drive at 5 V
- Low Input Current of 1 µA Max



DESCRIPTION

NC - No internal connection

#### **FUNCTION TABLE** (EACH INVERTER)

 $\downarrow$  V<sub>cc</sub>

13 6A

12 6Y

10 5Y

h

🗌 4A

14

11 5A

9

8 4Y

1A

1Y

2A

2Y

3A Γ 5

3Y

GND

Г

Г 6

2 Г

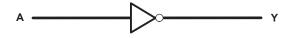
3

4

7

INPUT A	OUTPUT Y
Н	L
L	Н

### LOGIC DIAGRAM (POSITIVE LOGIC)





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.

TEXAS INSTRUMENTS

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### Absolute Maximum Ratings<sup>(1)</sup>

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
$V_{CC}$	Supply voltage range		-0.5	7	V
I <sub>IK</sub>	Input clamp current <sup>(2)</sup>	$V_{I} < 0 \text{ or } V_{I} > V_{CC}$		±20	mA
I <sub>OK</sub>	Output clamp current <sup>(2)</sup>	V <sub>O</sub> < 0		±20	mA
I <sub>O</sub>	Continuous output current	$V_0 = 0$ to $V_{CC}$		±25	mA
	Continuous current through V <sub>CC</sub> or GND			±50	mA
		D package		86	
^	Declares theread impedance (3)	N package		80	°C/W
$\theta_{JA}$	Package thermal impedance <sup>(3)</sup>	NS package		76	°C/w
		PW package		113	
T <sub>stg</sub>	Storage temperature range		-60	150	°C

(1) 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.

(2) The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

(3) The package thermal impedance is calculated in accordance with JESD 51-7.

### **Recommended Operating Conditions**<sup>(1)</sup>

			S	N54HC04		SI	N74HC04		UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
$V_{CC}$	Supply voltage		2	5	6	2	5	6	V
		$V_{CC} = 2 V$	1.5			1.5			
VIH	High-level input voltage	$V_{CC} = 4.5 V$	3.15			3.15			V
		$V_{CC} = 6 V$	4.2			4.2			
		$V_{CC} = 2 V$			0.5			0.5	
VIL	Low-level input voltage	$V_{CC} = 4.5 V$			1.35			1.35	V
		$V_{CC} = 6 V$			1.8			1.8	
VI	Input voltage		0		V <sub>CC</sub>	0		V <sub>CC</sub>	V
Vo	Output voltage		0		V <sub>CC</sub>	0		$V_{CC}$	V
		$V_{CC} = 2 V$			1000			1000	
Δt/Δv	Input transition rise or fall rate	$V_{CC} = 4.5 V$			500			500	ns
		$V_{CC} = 6 V$			400			400	
T <sub>A</sub>	Operating free-air temperature		-55		125	-40		85	°C

 All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.



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### **Electrical Characteristics**

over operating free-air temperature range (unless otherwise noted)

	TEST		N	т	<sub>A</sub> = 25°C	;	SN54H	C04	SN74H	IC04	
PARAMETER	IESI CO	ONDITIONS	V <sub>cc</sub>	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
			2 V	1.9	1.998		1.9		1.9		
V <sub>OH</sub>		I <sub>OH</sub> = -20 μA	4.5 V	4.4	4.499		4.4		4.4		
	$V_{I} = V_{IH}$ or $V_{IL}$		6 V	5.9	5.999		5.9		5.9		V
	*IL	$I_{OH} = -4 \text{ mA}$	4.5 V	3.98	4.3		3.7		3.84		
		I <sub>OH</sub> = -5.2 mA	6 V	5.48	5.8		5.2		5.34		
			2 V		0.002	0.1		0.1		0.1	
		I <sub>OL</sub> = 20 μA	4.5 V		0.001	0.1		0.1		0.1	
V <sub>OL</sub>	$V_{I} = V_{IH}$ or $V_{IL}$		6 V		0.001	0.1		0.1		0.1	V
	*IL	$I_{OL} = 4 \text{ mA}$	4.5 V		0.17	0.26		0.4		0.33	
		I <sub>OL</sub> = 5.2 mA	6 V		0.15	0.26		0.4		0.33	
I <sub>I</sub>	$V_I = V_{CC} \text{ or } 0$		6 V		±0.1	±100		±1000		±1000	nA
I <sub>CC</sub>	$V_I = V_{CC} \text{ or } 0,$	I <sub>O</sub> = 0	6 V			2		40		20	μA
Ci			2 V to 6 V		3	10		10		10	pF

### **Switching Characteristics**

over operating free-air temperature range,  $C_L$  = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	то	v	Τ <sub>4</sub>	∖ = 25°C		SN54HC04	SN74H	IC04	UNIT
PARAMETER	(INPUT)	(OUTPUT)	V <sub>cc</sub>	MIN	TYP	MAX	MIN MAX	MIN	MAX	UNIT
			2 V		45	95	125		120	
t <sub>pd</sub>	А	Y	4.5 V		9	19	29		24	ns
			6 V		8	16	25		20	
			2 V		38	75	110		95	
t <sub>t</sub>		Y	4.5 V		8	15	22		19	ns
			6 V		6	13	19		16	

## **Operating Characteristics**

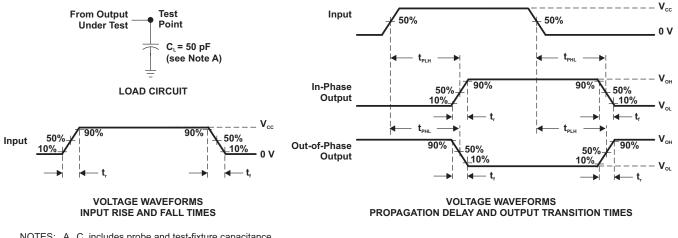
$T_A =$	25°C
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	PARAMETER	TEST CONDITIONS	TYP	UNIT
C <sub>pd</sub>	Power dissipation capacitance per inverter	No load	20	pF



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### PARAMETER MEASUREMENT INFORMATION



NOTES: A. C<sub>L</sub> includes probe and test-fixture capacitance.

- B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz,  $Z_o$  = 50  $\Omega$ ,  $t_r$  = 6 ns,  $t_r$  = 6 ns.
- C. The outputs are measured one at a time with one input transition per measurement.
- D.  $t_{PLH}$  and  $\dot{t}_{PHL}$  are the same as  $t_{pd}$ .

Figure 1. Load Circuit and Voltage Waveforms

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## **REVISION HISTORY**

### Changes from Revision E (October 2010) to Revision F

٠	Removed Ordering Information table.	1
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4-Dec-2014

## **PACKAGING INFORMATION**

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
5962-8409801VCA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	(43) 5962-8409801VC A SNV54HC04J	Samples
5962-8409801VDA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8409801VD A SNV54HC04W	Samples
84098012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	84098012A SNJ54HC 04FK	Samples
8409801CA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	8409801CA SNJ54HC04J	Samples
8409801DA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	8409801DA SNJ54HC04W	Samples
JM38510/65701B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 65701B2A	Samples
JM38510/65701BCA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65701BCA	Samples
JM38510/65701BDA	NRND	CFP	W	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65701BDA	
M38510/65701B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 65701B2A	Samples
M38510/65701BCA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65701BCA	Samples
M38510/65701BDA	NRND	CFP	W	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65701BDA	
SN54HC04J	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54HC04J	Samples
SN74HC04D	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Samples
SN74HC04DBR	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Samples
SN74HC04DBRE4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Samples
SN74HC04DBRG4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Samples



## PACKAGE OPTION ADDENDUM

4-Dec-2014

Orderable Device	Status	Package Type	Package	Pins	Package	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Sam
	(1)		Drawing		Qty	(2)	(6)	(3)		(4/5)	
SN74HC04DE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DRG3	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sam
SN74HC04DTG4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	San
SN74HC04N	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU   CU SN	N / A for Pkg Type	-40 to 85	SN74HC04N	San
SN74HC04N3	OBSOLETE	PDIP	Ν	14		TBD	Call TI	Call TI	-40 to 85		
SN74HC04NE4	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74HC04N	Sar
SN74HC04NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PWG4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PWLE	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 85		
SN74HC04PWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PWRG4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar
SN74HC04PWT	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC04	Sar



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Orderable Device	Status	Package Type	Package	Pins	Package	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Samples
	(1)		Drawing		Qty	(2)	(6)	(3)		(4/5)	
SNJ54HC04FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	84098012A SNJ54HC 04FK	Samples
SNJ54HC04J	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	8409801CA SNJ54HC04J	Samples
SNJ54HC04W	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type	-55 to 125	8409801DA SNJ54HC04W	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.

<sup>(2)</sup> 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)

<sup>(3)</sup> MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

<sup>(4)</sup> There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

<sup>(5)</sup> 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.

<sup>(6)</sup> 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.

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#### OTHER QUALIFIED VERSIONS OF SN54HC04, SN54HC04-SP, SN74HC04 :

- Catalog: SN74HC04, SN54HC04
- Automotive: SN74HC04-Q1, SN74HC04-Q1
- Military: SN54HC04
- Space: SN54HC04-SP

NOTE: Qualified Version Definitions:

- Catalog TI's standard catalog product
- Automotive Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military QML certified for Military and Defense Applications
- Space Radiation tolerant, ceramic packaging and qualified for use in Space-based application

## PACKAGE MATERIALS INFORMATION

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### TAPE AND REEL INFORMATION





## QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal												
Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74HC04DBR	SSOP	DB	14	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1
SN74HC04DR	SOIC	D	14	2500	330.0	16.8	6.5	9.5	2.3	8.0	16.0	Q1
SN74HC04DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC04DRG3	SOIC	D	14	2500	330.0	16.8	6.5	9.5	2.3	8.0	16.0	Q1
SN74HC04DRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC04DRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC04DT	SOIC	D	14	250	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC04PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74HC04PWT	TSSOP	PW	14	250	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1

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## PACKAGE MATERIALS INFORMATION

11-Oct-2013



*All dimensions are nominal							
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74HC04DBR	SSOP	DB	14	2000	367.0	367.0	38.0
SN74HC04DR	SOIC	D	14	2500	364.0	364.0	27.0
SN74HC04DR	SOIC	D	14	2500	333.2	345.9	28.6
SN74HC04DRG3	SOIC	D	14	2500	364.0	364.0	27.0
SN74HC04DRG4	SOIC	D	14	2500	367.0	367.0	38.0
SN74HC04DRG4	SOIC	D	14	2500	333.2	345.9	28.6
SN74HC04DT	SOIC	D	14	250	367.0	367.0	38.0
SN74HC04PWR	TSSOP	PW	14	2000	367.0	367.0	35.0
SN74HC04PWT	TSSOP	PW	14	250	367.0	367.0	35.0

J (R-GDIP-T\*\*) 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



NOTES: A. All linear dimensions are in inches (millimeters).

- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



- 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 only.
  - E. Falls within MIL STD 1835 GDFP1-F14



LEADLESS CERAMIC CHIP CARRIER

FK (S-CQCC-N\*\*) 28 TERMINAL SHOWN



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



## N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

- A. All linear dimensions are in inches (millimeters).B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- $\triangle$  The 20 pin end lead shoulder width is a vendor option, either half or full width.



D (R-PDSO-G14)

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 AB.





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.



PW (R-PDSO-G14)

PLASTIC SMALL OUTLINE



A. An integration of the information o

Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.

Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.

E. Falls within JEDEC MO-153



## PW (R-PDSO-G14)

# PLASTIC SMALL OUTLINE



- 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.



### MECHANICAL DATA

### PLASTIC SMALL-OUTLINE PACKAGE

### 0,51 0,35 ⊕0,25⊛ 1,27 8 14 0,15 NOM 5,60 8,20 5,00 7,40 $\bigcirc$ Gage Plane ₽ 0,25 7 1 1,05 0,55 0-10 Δ 0,15 0,05 Seating Plane — 2,00 MAX 0,10PINS \*\* 14 16 20 24 DIM 10,50 10,50 12,90 15,30 A MAX A MIN 9,90 9,90 12,30 14,70 4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.

NS (R-PDSO-G\*\*)

**14-PINS SHOWN** 

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



## **MECHANICAL DATA**

MSSO002E - JANUARY 1995 - REVISED DECEMBER 2001

## DB (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
- D. Falls within JEDEC MO-150



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