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Jameco Part Number 815550

SN54HCT373, SN74HCT373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

SCLS009D - MARCH 1984 - REVISED AUGUST 2003

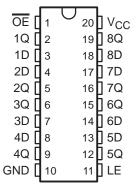
- Operating Voltage Range of 4.5 V to 5.5 V
- High-Current 3-State True Outputs Can Drive Up To 15 LSTTL Loads
- Low Power Consumption, 80-μA Max I_{CC}
- Typical t_{pd} = 21 ns
- ±6-mA Output Drive at 5 V
- Low Input Current of 1 μA Max
- Inputs Are TTL-Voltage Compatible
- Eight High-Current Latches in a Single Package
- Full Parallel Access for Loading

description/ordering information

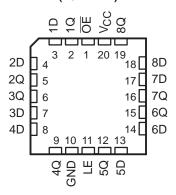
These 8-bit latches feature 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The eight latches of the 'HCT373 devices are transparent D-type latches. While the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the levels that were set up at the D inputs.

SN54HCT373 . . . J OR W PACKAGE SN74HCT373 . . .DB, DW, N, NS, OR PW PACKAGE (TOP VIEW)



SN54HCT373 . . .FK PACKAGE (TOP VIEW)



ORDERING INFORMATION

TA	PACKAGET		ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube of 20	SN74HCT373N	SN74HCT373N
	SOIC - DW	Tube of 25	SN74HCT373DW	HCT373
	30IC - DVV	Reel of 2000	SN74HCT373DWR	HC1373
-40°C to 85°C	SOP - NS	Reel of 2000	SN74HCT373NSR	HCT373
-40 C 10 65 C	SSOP – DB	Reel of 2000	SN74HCT373DBR	HT373
		Tube of 70	SN74HCT373PW	
	TSSOP - PW	Reel of 2000	SN74HCT373PWR	HT373
		Reel of 250	SN74HCT373PWT	
	CDIP – J	Tube of 20	SNJ54HCT373J	SNJ54HCT373J
–55°C to 125°C	CFP – W	Tube of 85	SNJ54HCT373W	SNJ54HCT373W
	LCCC – FK	Tube of 55	SNJ54HCT373FK	SNJ54HCT373FK

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



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description/ordering information (continued)

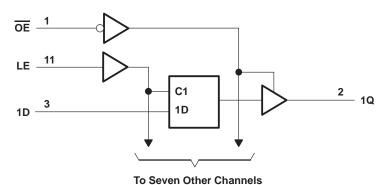
An output-enable (\overline{OE}) input places the eight outputs in either a normal logic state (high or low logic levels) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide the capability to drive bus lines without interface or pullup components.

OE does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are off.

FUNCTION TABLE (each latch)

	INPUTS	OUTPUT	
OE	LE	D	Q
L	Н	Н	Н
L	Н	L	L
L	L	Χ	Q ₀
Н	Χ	Χ	Z

logic diagram (positive logic)



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

Supply voltage range, V _{CC}		0.5 V to 7 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see	ee Note 1)	±20 mA
Output clamp current, IOK (VO < 0 or VO > VCO	C) (see Note 1)	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	- 	±35 mA
Continuous current through V _{CC} or GND		±70 mA
Package thermal impedance, θ _{JA} (see Note 2):	: DB package	70°C/W
	DW package	58°C/W
	N package	69°C/W
	NS package	60°C/W
	PW package	83°C/W
Storage temperature range, T _{sto}		–65°C to 150°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.



NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

^{2.} The package thermal impedance is calculated in accordance with JESD 51-7.

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recommended operating conditions (see Note 3)

			SN	54HCT3	73	SN	74HCT3	73	UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
VCC	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
VIH	High-level input voltage	V _{CC} = 4.5 V to 5.5 V	2			2			V
V _{IL}	Low-level input voltage	V _{CC} = 4.5 V to 5.5 V			0.8			0.8	V
VI	Input voltage		0		VCC	0		VCC	V
Vo	Output voltage		0		VCC	0		VCC	V
Δt/Δν	Input transition rise/fall time				500			500	ns
TA	Operating free-air temperature		-55		125	-40		85	°C

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

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

DADAMETED	AMETER TEST CONDITIONS		Vaa	Т	A = 25°C	;	SN54HCT373		SN74HCT373		UNIT
PARAMETER			Vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	ONII
Vall	\\ \\ or \\.	$I_{OH} = -20 \mu A$	4.5 V	4.4	4.499		4.4		4.4		V
VOH	VI = VIH or VIL	I _{OH} = -6 mA	4.5 V	3.98	4.3		3.7		3.84]
Voi	VI = VIH or VIL	I _{OL} = 20 μA	4.5 V		0.001	0.1		0.1		0.1	V
VOL	VI = VIH OI VIL	I _{OL} = 6 mA	4.5 V		0.17	0.26		0.4		0.33	V
lį	$V_I = V_{CC}$ or 0		5.5 V		±0.1	±100		±1000		±1000	nA
loz	VO = VCC or 0		5.5 V		±0.01	±0.5		±10		±5	μΑ
Icc	$V_I = V_{CC}$ or 0,	I _O = 0	5.5 V			8		160		80	μΑ
ΔI _{CC} †	One input at 0.5 V Other inputs at 0 or		5.5 V		1.4	2.4		3		2.9	mA
Ci			4.5 V to 5.5 V		3	10		10		10	pF

[†] This is the increase in supply current for each input that is at one of the specified TTL voltage levels, rather than 0 V or V_{CC}.

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

		Vaa	T _A = 25°C		SN54HCT373		SN74HCT373		UNIT
		Vcc	MIN	MAX	MIN	MAX	MIN	MAX	UNIT
	Pulse duration, LE high	4.5 V	20		30		25		ns ns
t _W		5.5 V	17		27		23		
	Setup time, data before LE↓	4.5 V	10		15		13		ns
t _{su}		5.5 V	9		14		12		
.	Hold time, data after LE↓	4.5 V	10		10		10		ns
t _h		5.5 V	10		10		10		



SN54HCT373, SN74HCT373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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

PARAMETER	FROM	то	Vaa	TA	√ = 25°C	;	SN54H	CT373	SN74H0	CT373	UNIT	
PARAMETER	(INPUT)	(OUTPUT)	vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT	
	D	Q	4.5 V		25	35		53		44		
	Ь		5.5 V		21	32		48		40	ns	
^t pd	LE	Any Q	4.5 V		28	35		53		44	115	
			Ally Q	Ally Q	5.5 V		25	32		48		40
4		A O	4.5 V		26	35		53		44	no	
^t en	ŌĒ	Any Q	5.5 V		23	32		48		40	ns	
+	ŌĒ	Any Q	4.5 V		23	35		53		44	ns	
^t dis	OE	Ally Q	5.5 V		22	32		48		40	115	
4.		Any O	4.5 V		10	12		18		15	no	
t _t		Any Q	5.5 V		9	11		16		14	ns	

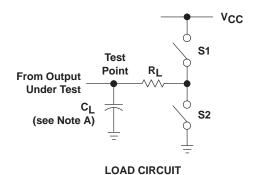
switching characteristics over recommended operating free-air temperature range, C_L = 150 pF (unless otherwise noted) (see Figure 1)

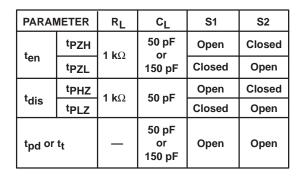
PARAMETER	FROM	то	Vaa	T,	λ = 25°C	;	SN54H	CT373	SN74H	CT373	UNIT
PARAMETER	(INPUT)	(OUTPUT)	(OUTPUT) VCC		TYP	MAX	MIN	MAX	MIN	MAX	UNIT
	D	Q	4.5 V		32	52		79		65	
			5.5 V		27	47		71		59	200
^t pd	LE	Any Q	4.5 V		38	52		79		65	ns
	LL		5.5 V		36	47		71		59	
	ŌĒ	Δην. Ο	4.5 V		33	52		79		65	ns
^t en	^t en OE	Any Q	5.5 V		28	47		71		59	115
4.		Δην. Ο	4.5 V		18	42		63		53	no
t _t		Any Q	5.5 V		16	38		57		48	ns

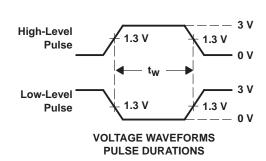
operating characteristics, T_A = 25°C

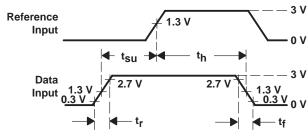
	PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance per latch	No load	50	pF

PARAMETER MEASUREMENT INFORMATION

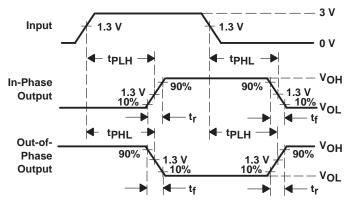


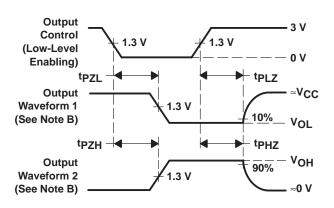






VOLTAGE WAVEFORMS
SETUP AND HOLD AND INPUT RISE AND FALL TIMES





VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT RISE AND FALL TIMES

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES FOR 3-STATE OUTPUTS

NOTES: A. C_L includes probe and test-fixture capacitance.

- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_O = 50 \Omega$, $t_r = 6$ ns, $t_f = 6$ ns.
- D. The outputs are measured one at a time with one input transition per measurement.
- E. tpLz and tpHz are the same as tdis.
- F. tpzL and tpzH are the same as ten.
- G. tpLH and tpHL are the same as tpd.

Figure 1. Load Circuit and Voltage Waveforms







18-Jul-2006

PACKAGING INFORMATION

		Package Type	Package Drawing	FIIIS	Qty	Eco Plan ⁽²⁾	LEAU/DAII FIIIISN	MSL Peak Temp (3)
5962-86867012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
5962-8686701RA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
5962-8686701VRA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
5962-8686701VSA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type
JM38510/65453BRA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
JM38510/65453BSA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type
SN54HCT373J	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
SN74HCT373DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HCT373N3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SN74HCT373NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HCT373NSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373NSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI
SN74HCT373PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWT	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HCT373PWTE4	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54HCT373FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54HCT373J	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54HCT373W	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type

(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.



PACKAGE OPTION ADDENDUM

18-Jul-2006

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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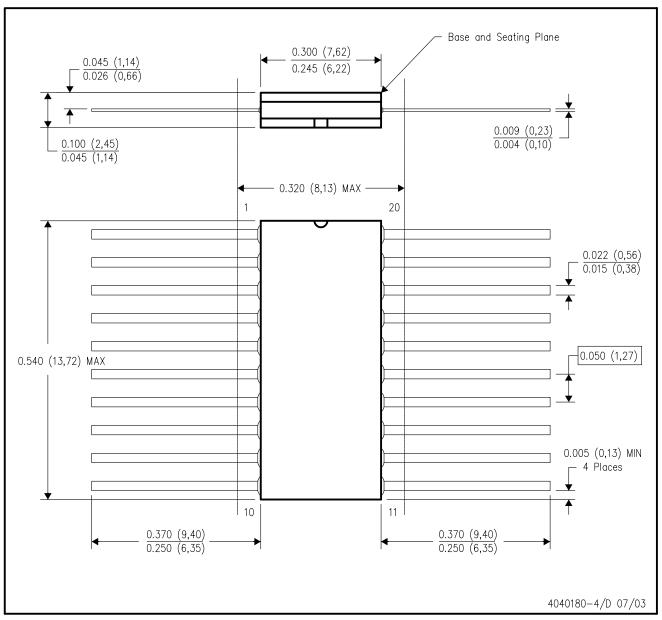
14 LEADS SHOWN



- 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-F20)

CERAMIC DUAL FLATPACK



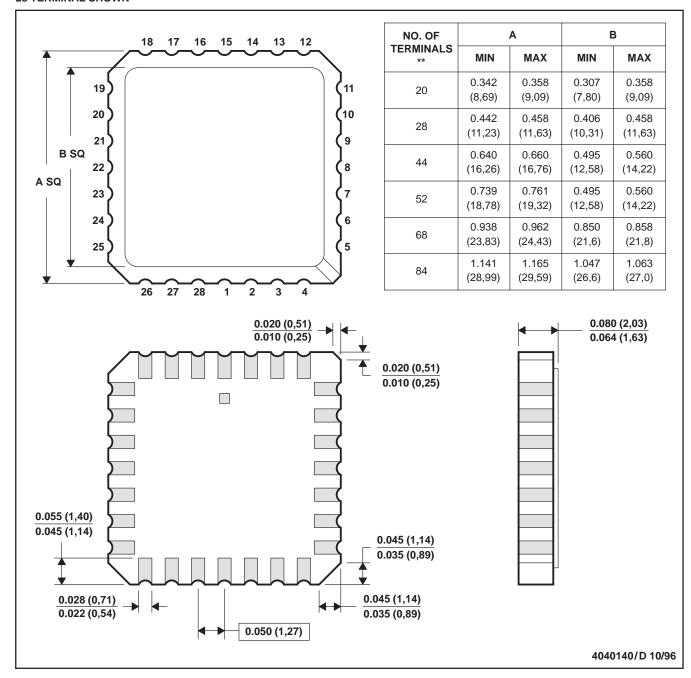
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within Mil-Std 1835 GDFP2-F20



FK (S-CQCC-N**)

28 TERMINAL SHOWN

LEADLESS CERAMIC CHIP CARRIER



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. The terminals are gold plated.
- E. Falls within JEDEC MS-004



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN

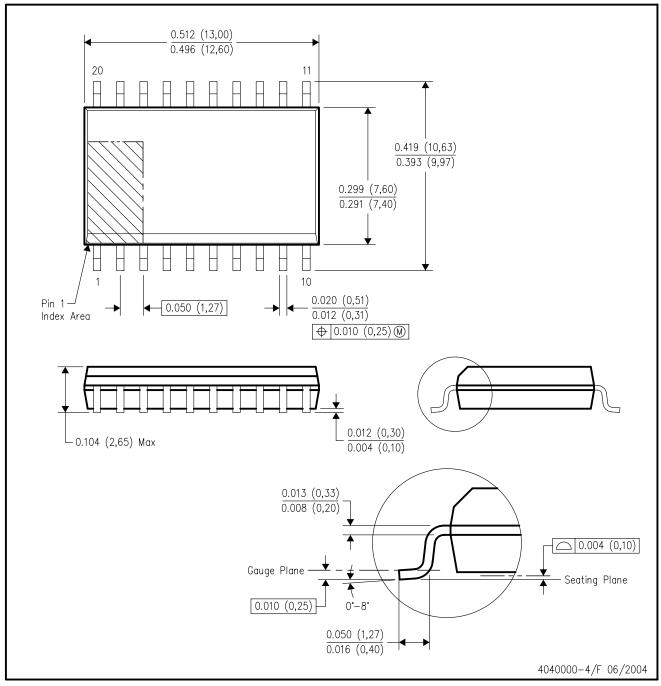


- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.



DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AC.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- 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.



PW (R-PDSO-G**)

14 PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



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-153

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