SN54AHCT573, SN74AHCT573 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

SCLS243N - OCTOBER 1995 - REVISED JULY 2003

- Inputs Are TTL-Voltage Compatible
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

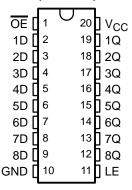
description/ordering information

The 'AHCT573 devices are octal transparent D-type latches. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is low, the Q outputs are latched at the logic levels of the D inputs.

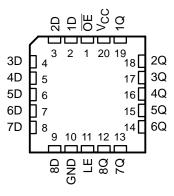
A buffered output-enable (\overline{OE}) input can be used to place the eight outputs in either a normal logic state (high or low) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide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

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

SN54AHCT573 . . . J OR W PACKAGE SN74AHCT573 . . . DB, DGV, DW, N, NS, OR PW PACKAGE (TOP VIEW)



SN54AHCT573 . . . FK PACKAGE (TOP VIEW)



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 in the high-impedance state.

ORDERING INFORMATION

TA	PACK	AGE†	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube	SN74AHCT573N	SN74AHCT573N
	SOIC - DW	Tube	SN74AHCT573DW	AHCT573
	30IC - DW	Tape and reel	SN74AHCT573DWR	AUC13/3
-40°C to 85°C	SOP - NS	Tape and reel	SN74AHCT573NSR	AHCT573
-40 C to 65 C	SSOP – DB	Tape and reel	SN74AHCT573DBR	HB573
	TSSOP – PW	Tube	SN74AHCT573PW	HB573
	1330F - FW	Tape and reel	SN74AHCT573PWR	прого
	TVSOP - DGV	Tape and reel	SN74AHCT573DGVR	HB573
	CDIP – J	Tube	SNJ54AHCT573J	SNJ54AHCT573J
–55°C to 125°C	CFP – W	Tube	SNJ54AHCT573W	SNJ54AHCT573W
	LCCC – FK	Tube	SNJ54AHCT573FK	SNJ54AHCT573FK

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



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.

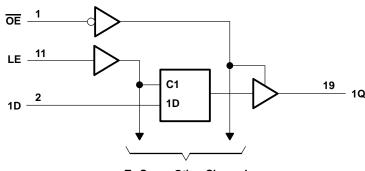


SCLS243N - OCTOBER 1995 - REVISED JULY 2003

FUNCTION TABLE (each latch)

	INPUTS	ОИТРИТ	
OE	LE	D	Q
L	Н	Н	Н
L	Н	L	L
L	L	Χ	Q_0
Н	X	Χ	Z

logic diagram (positive logic)



To Seven Other Channels

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

Supply voltage range, V _{CC}		–0.5 V to 7 V
Input voltage range, V _I (see Note 1)		–0.5 V to 7 V
Output voltage range, VO (see Note 1)		0.5 V to V _{CC} + 0.5 V
Input clamp current, I _{IK} (V _I < 0)		–20 mA
Output clamp current, IOK (VO < 0 or VO > VCC	;)	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})		±25 mA
Continuous current through V _{CC} or GND		±75 mA
Package thermal impedance, θ_{JA} (see Note 2):	DB package	70°C/W
	DGV package	92°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 _{Stq}		–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.



SCLS243N - OCTOBER 1995 - REVISED JULY 2003

recommended operating conditions (see Note 3)

		SN54AH	CT573	SN74AH	CT573	UNIT
		MIN	MAX	MIN	MAX	UNIT
VCC	Supply voltage	4.5	5.5	4.5	5.5	V
VIH	High-level input voltage	2		2		V
VIL	Low-level input voltage		0.8		0.8	V
٧ _I	Input voltage	0	5.5	0	5.5	V
۷o	Output voltage	0	VCC	0	VCC	V
ІОН	High-level output current		-8		-8	mA
lOL	Low-level output current		8		8	mA
Δt/Δν	Input transition rise or fall rate		20		20	ns/V
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)

PARAMETER	TEST CONDITIONS	Vaa	T,	ղ = 25°C	;	SN54AH	CT573	SN74AH	UNIT	
PARAMETER	TEST CONDITIONS	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
Vari	I _{OH} = -50 μA	4.5 V	4.4	4.5		4.4		4.4		V
VOH	$I_{OH} = -8 \text{ mA}$	4.5 V	3.94			3.8		3.8		V
Voi	I _{OL} = 50 μA	4.5 V			0.1		0.1		0.1	V
VOL	$I_{OL} = 8 \text{ mA}$	4.5 V			0.36		0.44		0.44	V
Ι _Ι	V _I = 5.5 V or GND	0 V to 5.5 V			±0.1		±1*		±1	μΑ
loz	$V_O = V_{CC}$ or GND	5.5 V			±0.25		±2.5		±2.5	μΑ
Icc	$V_{I} = 5.5 \text{ V or GND}, I_{O} = 0$	5.5 V			4		40		40	μΑ
Δl _{CC} †	One input at 3.4 V, Other inputs at V _{CC} or GND	5.5 V			1.35		1.5		1.5	mA
C _i	V _I = V _{CC} or GND	5 V		2.5	10				10	pF
Co	$V_O = V_{CC}$ or GND	5 V		3					·	pF

^{*} On products compliant to MIL-PRF-38535, this parameter is not production tested at V_{CC} = 0 V.

timing requirements over recommended operating free-air temperature range, $\rm V_{cc}$ = 5 V \pm 0.5 V (unless otherwise noted) (see Figure 1)

		$T_A = 2$	25°C	SN54AH	CT573	SN74AH	CT573	UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	ONIT
t _W	Pulse duration, LE high	5		5		5		ns
t _{su}	Setup time, data before LE↓	3.5		3.5		3.5		ns
t _h	Hold time, data after LE↓	1.5		1.5		1.5		ns



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

SN54AHCT573, **SN74AHCT573 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS**

SCLS243N - OCTOBER 1995 - REVISED JULY 2003

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V \pm 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	то	LOAD	TA	= 25°C	;	SN54AH	CT573	SN74AH	CT573	UNIT		
PARAMETER	(INPUT)	(OUTPUT)	CAPACITANCE	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNII		
^t PLH	D	Q	C _I = 15 pF		4.2*	6*	1*	6.5*	1	6.5	ns		
t _{PHL}	D	Q	CL = 13 μ		5.1*	7*	1*	9*	1	9	115		
^t PLH	LE	Q	C _L = 15 pF		4.7*	6.5*	1*	7.5*	1	7.5	ns		
^t PHL	LL	Q	CL = 13 μ		5.6*	7.5*	1*	9*	1	9	115		
^t PZH	ŌĒ	Q	C: -15 pE		4.1*	6.5*	1*	7*	1	7	20		
tPZL	OE	Q	C _L = 15 pF		5.5*	7.5*	1*	10*	1	10 ns	115		
t _{PHZ}	ŌĒ	Q	C _I = 15 pF		5.5*	8*	1*	11*	1	11	ns		
^t PLZ	OE	Q	CL = 13 μ		5.4*	8*	1*	9.5*	1	9.5	115		
^t PLH	D	Q	C _L = 50 pF		5.2	7	1	7.5	1	7.5	ns		
^t PHL	Ь	Q	CL = 30 pr		6.1	8	1	10	1	10	115		
^t PLH	LE	Q	C _L = 50 pF		5.7	7.5	1	8.5	1	8.5	ns		
^t PHL	LL	Q	CL = 30 pr		6.6	8.5	1	10	1	10	115		
^t PZH	ŌĒ	Q	C _L = 50 pF		5.1	7.5	1	8	1	8	ns		
t _{PZL}	OE	Q	CL = 30 pr		6.5	8.5	1	11	1	11	115		
^t PHZ	ŌĒ	Q	Q	Q	0 0 50 75		6.7	9	1	12	1	12	ns
^t PLZ	OE .				Q	Q	Q	$C_L = 50 \text{ pF}$		6.4	9	1	10.5
^t sk(o)			C _L = 50 pF		•	1.5**				1.5	ns		

^{*} On products compliant to MIL-PRF-38535, this parameter is not production tested.

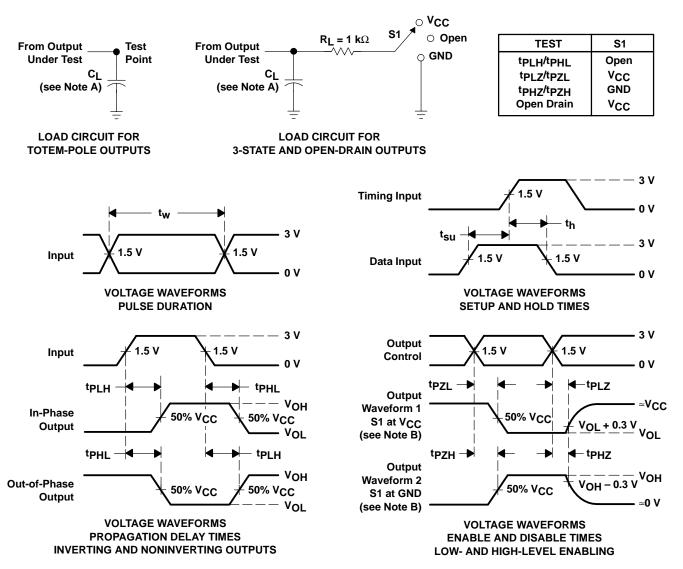
operating characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$

	PARAMETER	TEST C	ONDITIONS	TYP	UNIT
Ī	C _{pd} Power dissipation capacitance	No load,	f = 1 MHz	16	pF



^{**} On products compliant to MIL-PRF-38535, this parameter does not apply.

PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig 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. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_Q = 50 \Omega$, $t_f \leq$ 3 ns, $t_f \leq$ 3 ns.
- D. The outputs are measured one at a time with one input transition per measurement.
- E. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms





5-Sep-2011

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
5962-9685501Q2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Call TI	
5962-9685501QRA	ACTIVE	CDIP	J	20	1	TBD	Call TI	Call TI	
5962-9685501QSA	ACTIVE	CFP	W	20	1	TBD	Call TI	Call TI	
SN74AHCT573DBLE	OBSOLETE	SSOP	DB	20		TBD	Call TI	Call TI	
SN74AHCT573DBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DGVR	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DGVRE4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DGVRG4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573DWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74AHCT573NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74AHCT573PW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	





www.ti.com 5-Sep-2011

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
SN74AHCT573PWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573PWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573PWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	
SN74AHCT573PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AHCT573PWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SNJ54AHCT573FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
SNJ54AHCT573J	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	
SNJ54AHCT573W	ACTIVE	CFP	W	20	1	TBD	Call TI	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.

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.

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.





5-Sep-2011

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.

OTHER QUALIFIED VERSIONS OF SN54AHCT573, SN74AHCT573:

Catalog: SN74AHCT573

Automotive: SN74AHCT573-Q1, SN74AHCT573-Q1

Military: SN54AHCT573

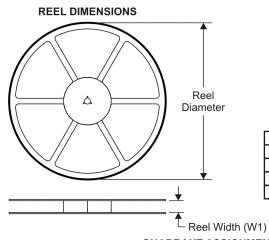
NOTE: Qualified Version Definitions:

- 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

PACKAGE MATERIALS INFORMATION

www.ti.com 28-Jul-2011

TAPE AND REEL INFORMATION





	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		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AHCT573DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74AHCT573DGVR	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHCT573DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
SN74AHCT573PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
SN74AHCT573PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

www.ti.com 28-Jul-2011



*All dimensions are nominal

741 dimensions are norminal							
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHCT573DBR	SSOP	DB	20	2000	346.0	346.0	33.0
SN74AHCT573DGVR	TVSOP	DGV	20	2000	346.0	346.0	29.0
SN74AHCT573DWR	SOIC	DW	20	2000	346.0	346.0	41.0
SN74AHCT573PWR	TSSOP	PW	20	2000	364.0	364.0	27.0
SN74AHCT573PWR	TSSOP	PW	20	2000	346.0	346.0	33.0

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**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- 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



- 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.



DGV (R-PDSO-G**)

24 PINS SHOWN

PLASTIC SMALL-OUTLINE



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 per side.

D. Falls within JEDEC: 24/48 Pins – MO-153 14/16/20/56 Pins – MO-194 DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

- 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.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- 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 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



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

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Applications

interface.ti.com

Audio www.ti.com/audio Communications and Telecom www.ti.com/communications **Amplifiers** amplifier.ti.com Computers and Peripherals www.ti.com/computers dataconverter.ti.com Consumer Electronics www.ti.com/consumer-apps **Data Converters DLP® Products** www.dlp.com **Energy and Lighting** www.ti.com/energy DSP dsp.ti.com Industrial www.ti.com/industrial Clocks and Timers www.ti.com/clocks Medical www.ti.com/medical

Logic logic.ti.com Space, Avionics and Defense www.ti.com/space-avionics-defense

Security

Power Mgmt power.ti.com Transportation and Automotive www.ti.com/automotive

Microcontrollers microcontroller.ti.com Video and Imaging www.ti.com/video

RFID <u>www.ti-rfid.com</u>

OMAP Mobile Processors www.ti.com/omap

Interface

Wireless Connctivity www.ti.com/wirelessconnectivity

TI E2E Community Home Page <u>e2e.ti.com</u>

www.ti.com/security