- Function and Pinout Compatible With the Fastest Bipolar Logic
- 25-Ω Output Series Resistors Reduce Transmission-Line Reflection Noise
- Reduced V_{OH} (Typically = 3.3 V) Version of Equivalent FCT Functions
- Edge-Rate Control Circuitry for Significantly Improved Noise Characteristics
- I_{off} Supports Partial-Power-Down Mode Operation
- Matched Rise and Fall Times
- 3-State Outputs
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)
- Fully Compatible With TTL Input and Output Logic Levels
- 12-mA Output Sink Current
 15-mA Output Source Current

Q OR SO PACKAGE (TOP VIEW) OE [20 VCC O₀ [] 2 19 O₇ D₀ [] 3 18 D₇ $D_1 \prod 4$ 17 D₆ O₁ [] 5 16 O₆ 15 \ O₅ $D_2 \begin{bmatrix} 1 \\ 7 \end{bmatrix}$ 14 D₅ $D_3 [8]$ 13 D₄ O₃ **[**] 9 12 O₄ GND [] 10 11 **∏** LE

description

The CY74FCT2373T is an 8-bit, high-speed CMOS, TTL-compatible buffered latch with 3-state outputs that is ideal for driving high-capacitance loads, such as memory and address buffers. On-chip 25- Ω termination resistors at the outputs reduce system noise caused by reflections. The CY74FCT2373T can replace the CY74FCT373T to reduce noise in an existing design.

When the latch-enable (LE) input is high, the flip-flops appear transparent to the data. Data that meets the required setup times are latched when LE transitions from high to low. Data appears on the bus when the output-enable (\overline{OE}) input is low. When \overline{OE} is high, the bus output is in the high-impedance state. In this mode, data can be entered into the latches.

This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

ORDERING INFORMATION

TA	PACKAGE†		PACKAGE†		PACKAGET		PACKAGET		SPEED (ns)	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	QSOP – Q	Tape and reel	4.7	CY74FCT2373CTQCT	FCT2373C						
	SOIC - SO	Tube 4.7 CY74F0		CY74FCT2373CTSOC	FCT2373C						
–40°C to 85°C		Tape and reel	4.7	CY74FCT2373CTSOCT	FC12373C						
	QSOP – Q	Tape and reel	5.2	CY74FCT2373ATQCT	FCT2373A						
	QSOP – Q	Tape and reel	8	CY74FCT2373TQCT	FCT2373						

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



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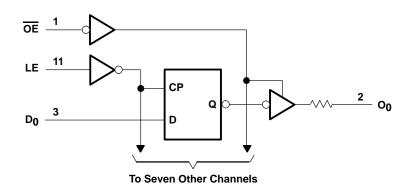


FUNCTION TABLE

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

H = High logic level, L = Low logic level, X = Don't care, Z = High-impedance state, Q_0 = Previous state of flip flops (Q_{0-1})

logic diagram



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

Supply voltage range to ground potential	0.5 V to 7 V
DC input voltage range	\dots -0.5 V to 7 V
DC output voltage range	\dots -0.5 V to 7 V
DC output current (maximum sink current/pin)	120 mA
Package thermal impedance, θ _{JA} (see Note 1): Q package	68°C/W
SO package	58°C/W
Ambient temperature range with power applied, T _A	. −65°C to 135°C
Storage temperature range, T _{stg}	. -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.

recommended operating conditions (see Note 2)

		MIN	NOM	MAX	UNIT
VCC	Supply voltage	4.75	5	5.25	V
VIH	High-level input voltage	2			V
VIL	Low-level input voltage			0.8	V
ЮН	High-level output current			-15	mA
loL	Low-level output current			12	mA
TA	Operating free-air temperature	-40		85	°C

NOTE 2: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.



NOTE 1: The package thermal impedance is calculated in accordance with JESD 51-7.

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

PARAMETER		TEST CONDITIONS	s	MIN	TYP†	MAX	UNIT
VIK	$V_{CC} = 4.75 V$,	$I_{IN} = -18 \text{ mA}$			-0.7	-1.2	V
VOH	$V_{CC} = 4.75 \text{ V},$	I _{OH} = -15 mA		2.4	3.3		V
V _{OL}	$V_{CC} = 4.75 \text{ V},$	I _{OL} = 12 mA			0.3	0.55	V
ROUT	$V_{CC} = 4.75 \text{ V},$	$I_{OL} = 12 \text{ mA}$		20	28	40	Ω
V _{hys}	All inputs				0.2		V
lį	V _{CC} = 5.25 V,	VIN = VCC				5	μΑ
lн	$V_{CC} = 5.25 \text{ V},$	$V_{IN} = 2.7 \text{ V}$				±1	μΑ
I _{IL}	$V_{CC} = 5.25 \text{ V},$	$V_{IN} = 0.5 V$				±1	μΑ
lozh	$V_{CC} = 5.25 \text{ V},$	V _{OUT} = 2.7 V				10	μΑ
lozL	$V_{CC} = 5.25 \text{ V},$	V _{OUT} = 0.5 V				-10	μΑ
los [‡]	$V_{CC} = 5.25 \text{ V},$	VOUT = 0 V		-60	-120	-225	mA
l _{off}	$V_{CC} = 0 V$,	V _{OUT} = 4.5 V				±1	μΑ
Icc	$V_{CC} = 5.25 \text{ V},$	$V_{IN} \le 0.2 V$,	$V_{IN} \ge V_{CC} - 0.2 \text{ V}$		0.1	0.2	mA
ΔlCC	V _{CC} = 5.25 V, V _{IN}	= 3.4 V\$, f ₁ = 0, Outputs op	oen		0.5	2	mA
I _{CCD} ¶		input switching at 50% duty 0.2 V or $V_{\text{IN}} \ge V_{\text{CC}} - 0.2 \text{ V}$	y cycle, Outputs open,		0.06	0.12	mA/ MHz
	V _{CC} = 5.25 V,	One input switching at f ₁ = 10 MHz	$V_{IN} \le 0.2 \text{ V or}$ $V_{IN} \ge V_{CC} - 0.2 \text{ V}$		0.7	1.4	
ı _{- #}	Outputs open,	at 50% duty cycle	$V_{IN} = 3.4 \text{ V or GND}$		1	2.4	mA
iC"	$IC^{\#}$ $Outputs open,$ $Outputs open,$ $DE = GND,$ $DE = VCC$	Eight bits switching at f ₁ = 2.5 MHz	$V_{IN} \le 0.2 \text{ V or}$ $V_{IN} \ge V_{CC} - 0.2 \text{ V}$		1.3	2.6	IIIA
		at 50% duty cycle	V _{IN} = 3.4 V or GND		3.3	10.6	
C _i					6	10	pF
Co					8	12	pF

[†] Typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$.

= Total supply current lC.

ICC = Power-supply current with CMOS input levels

 ΔI_{CC} = Power-supply current for a TTL high input ($V_{IN} = 3.4 \text{ V}$)

 D_H = Duty cycle for TTL inputs high = Number of TTL inputs at DH

I_{CCD} = Dynamic current caused by an input transition pair (HLH or LHL)

= Clock frequency for registered devices, otherwise zero

= Input signal frequency

= Number of inputs changing at f₁

All currents are in milliamperes and all frequencies are in megahertz.

|| Values for these conditions are examples of the I_{CC} formula.



[‡] Not more than one output should be shorted at a time. Duration of short should not exceed one second. The use of high-speed test apparatus and/or sample-and-hold techniques are preferable to minimize internal chip heating and more accurately reflect operational values. Otherwise, prolonged shorting of a high output can raise the chip temperature well above normal and cause invalid readings in other parametric tests. In any sequence of parameter tests, IOS tests should be performed last.

 $[\]$ Per TTL-driven input ($V_{IN} = 3.4 \text{ V}$); all other inputs at V_{CC} or GND

This parameter is derived for use in total power-supply calculations.

[#]IC $= I_{CC} + \Delta I_{CC} \times D_H \times N_T + I_{CCD}(f_0/2 + f_1 \times N_1)$ Where:

CY74FCT2373T 8-BIT LATCH WITH 3-STATE OUTPUTS

SCCS039B - SEPTEMBER 1994 - REVISED OCTOBER 2001

timing requirements over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

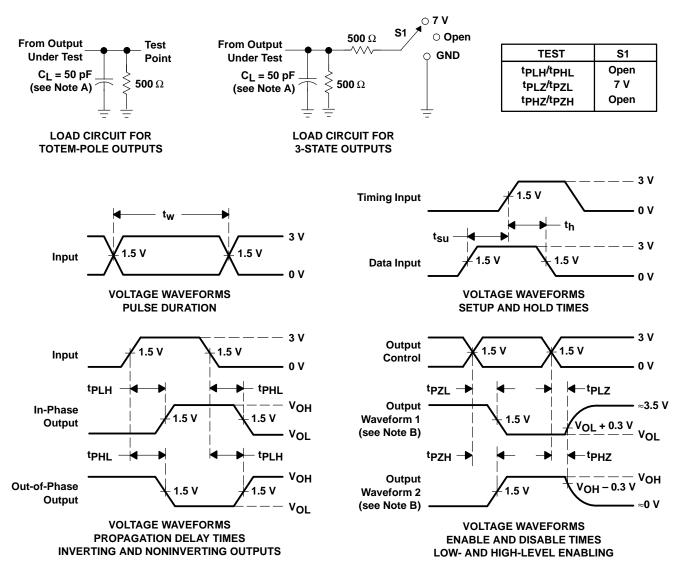
				CY74FCT2373T		CY74FCT2373AT		CY74FCT2373CT	
			MIN	MAX	MIN	MAX	MIN	MAX	UNIT
t _W	Pulse duration, LE high		6		5		5		ns
t _{su}	Setup time, D to LE	High to low	2		2		2		ns
t _h	Hold time, D to LE	High to low	1.5		1.5		1.5		ns

switching characteristics over operating free-air temperature range (see Figure 1)

PARAMETER	FROM	то	CY74FC	Г2373Т	CY74FCT	2373AT	CY74FCT2373CT		UNIT
PARAMETER	(INPUT)	(OUTPUT)	MIN	MAX	MIN	MAX	MIN	MAX	UNIT
t _{PLH}	D	0	1.5	8	1.5	5.2	1.5	4.7	ns
t _{PHL}	В		1.5	8	1.5	5.2	1.5	4.7	115
^t PLH	LE	0	2	13	2	8.5	2	5.5	ns
t _{PHL}	LE		2	13	2	8.5	2	5.5	
^t PZH	ŌĒ	0	1.5	11	1.5	6.5	1.5	5.5	ns
t _{PZL}	OE	0	1.5	11	1.5	6.5	1.5	5.5	116
^t PHZ	ŌĒ	0	1.5	7	1.5	5.5	1.5	5	ns
tPLZ	OE .	J	1.5	7	1.5	5.5	1.5	5	115



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. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms



PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
74FCT2373CTSOCTE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT2373CTSOCTG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT2573CTSOCTE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT2573CTSOCTG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2373ATQCT	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373ATQCTE4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373ATQCTG4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373CTQCT	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373CTQCTE4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373CTQCTG4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373CTSOC	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2373CTSOCE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2373CTSOCG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2373CTSOCT	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2373TQCT	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373TQCTE4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2373TQCTG4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573ATPWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573ATPWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573ATPWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573ATQCT	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573ATQCTE4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573ATQCTG4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573CTQCT	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573CTQCTE4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR





.com 24-May-2007

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
CY74FCT2573CTQCTG4	ACTIVE	SSOP/ QSOP	DBQ	20	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
CY74FCT2573CTSOC	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573CTSOCE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573CTSOCG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573CTSOCT	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOC	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOCE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOCG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOCT	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOCTE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT2573TSOCTG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

(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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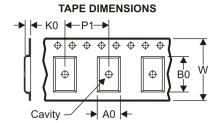




11-Mar-2008

TAPE AND REEL INFORMATION





Δ	10	Dimension designed to accommodate the component width
		Dimension designed to accommodate the component length
		Dimension designed to accommodate the component thickness
		Overall width of the carrier tape
		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
CY74FCT2373ATQCT	SSOP/ QSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT2373CTQCT	SSOP/ QSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT2373CTSOCT	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
CY74FCT2373TQCT	SSOP/ QSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT2573ATPWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
CY74FCT2573ATQCT	SSOP/ QSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT2573CTQCT	SSOP/ QSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT2573CTSOCT	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
CY74FCT2573TSOCT	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1





*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CY74FCT2373ATQCT	SSOP/QSOP	DBQ	20	2500	346.0	346.0	33.0
CY74FCT2373CTQCT	SSOP/QSOP	DBQ	20	2500	346.0	346.0	33.0
CY74FCT2373CTSOCT	SOIC	DW	20	2000	346.0	346.0	41.0
CY74FCT2373TQCT	SSOP/QSOP	DBQ	20	2500	346.0	346.0	33.0
CY74FCT2573ATPWR	TSSOP	PW	20	2000	346.0	346.0	33.0
CY74FCT2573ATQCT	SSOP/QSOP	DBQ	20	2500	346.0	346.0	33.0
CY74FCT2573CTQCT	SSOP/QSOP	DBQ	20	2500	346.0	346.0	33.0
CY74FCT2573CTSOCT	SOIC	DW	20	2000	346.0	346.0	41.0
CY74FCT2573TSOCT	SOIC	DW	20	2000	346.0	346.0	41.0

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

DBQ (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



NOTES:

- 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) per side.
- D. Falls within JEDEC MO-137 variation AD.



DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



NOTES:

- 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.



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