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- 4.5-V to 5.5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 10 ns at 5 V
- Inputs Are TTL-Voltage Compatible

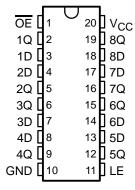
description/ordering information

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

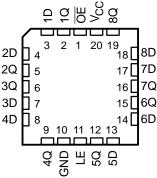
The eight latches are D-type transparent latches. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the logic levels set up at the D inputs.

A buffered output-enable (\overline{OE}) input can be used to place the eight outputs in either a normal logic state (high or low 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 in bus-organized systems without need for interface or pullup components.

SN54ACT373 . . . J OR W PACKAGE SN74ACT373 . . . DB, DW, N, NS, OR PW PACKAGE (TOP VIEW)



SN54ACT373 . . . 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.

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.

ORDERING INFORMATION

TA	PACKAGE	<u>=</u> †	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube	SN74ACT373N	SN74ACT373N
	SOIC - DW	Tube	SN74ACT373DW	ACT373
-40°C to 85°C	30IC - DW	Tape and reel	SN74ACT373DWR	AC1373
-40 C to 65 C	SOP - NS	Tape and reel	SN74ACT373NSR	ACT373
	SSOP – DB	Tape and reel	SN74ACT373DBR	AD373
	TSSOP – PW	Tape and reel	SN74ACT373PWR	AD373
	CDIP – J	Tube	SNJ54ACT373J	SNJ54ACT373J
–55°C to 125°C	CFP – W	Tube	SNJ54ACT373W	SNJ54ACT373W
	LCCC – FK	Tube	SNJ54ACT373FK	SNJ54ACT373FK

[†] 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.

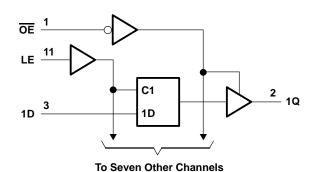


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FUNCTION TABLE (each latch)

	INPUTS	OUTPUT	
OE	LE	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 voltage range, V _I (see Note 1)		\dots -0.5 V to V _{CC} + 0.5 V
Output voltage range, VO (see Note 1)		$-0.5 \text{ V to V}_{CC} + 0.5 \text{ V}$
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$).		±20 mA
Output clamp current, I _{OK} (V _O < 0 or V _O > V _C	C) ·····	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})		
Continuous current through V _{CC} or GND		±200 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 _{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.

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)

		SN54A	CT373	SN74A	CT373	UNIT
		MIN	MAX	MIN	MAX	UNII
VCC	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level input voltage	2		2		V
V_{IL}	Low-level input voltage		0.8		0.8	V
٧ _I	Input voltage	0	VCC	0	VCC	V
٧o	Output voltage	0	VCC	0	VCC	V
ІОН	High-level output current		-24		-24	mA
l _{OL}	Low-level output current		24		24	mA
Δt/Δν	Input transition rise or fall rate		8		8	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)

DADAMETER	TEST COMPLIANCE	V	T,	Δ = 25°C	;	SN54A	CT373	SN74A	CT373	UNIT
PARAMETER	TEST CONDITIONS	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNII
	Jan - 50 WA	4.5 V	4.4	4.49		4.4		4.4		
	I _{OH} = -50 μA	5.5 V	5.4	5.49		5.4		5.4		
Vari	Jan - 24 mA	4.5 V	3.86			3.7		3.76		V
VOH	I _{OH} = -24 mA	5.5 V	4.86			4.7		4.76		V
	$I_{OH} = -50 \text{ mA}^{\dagger}$	5.5 V				3.85				
	$I_{OH} = -75 \text{ mA}^{\dagger}$	5.5 V						3.85		
	I _{OL} = 50 μA	4.5 V			0.1		0.1		0.1	
	ΙΟΣ = 50 μΑ	5.5 V			0.1		0.1		0.1	V
V	le: - 24 mA	4.5 V			0.36		0.44		0.44	
VOL	I _{OL} = 24 mA	5.5 V			0.36		0.44		0.44	
	I _{OL} = 50 mA [†]	5.5 V					1.65			
	$I_{OL} = 75 \text{ mA}^{\dagger}$	5.5 V							1.65	
loz	$V_O = V_{CC}$ or GND	5.5 V			±0.25		±5		±2.5	μΑ
lį	V _I = V _{CC} or GND	5.5 V			±0.1		±1		±1	μΑ
^I cc	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			4		80		40	μΑ
∆lcc [‡]	One input at 3.4 V, Other inputs at GND or V _{CC}	5.5 V		0.6			1.5		1.5	mA
Ci	V _I = V _{CC} or GND	5 V		4.5						pF

[†] Not more than one output should be tested at a time, and the duration of the test should not exceed 2 ms.

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

			25°C	SN54ACT373		SN74ACT373		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	UNIT
t _W	Pulse duration, LE high	7		8.5		8		ns
t _{su}	Setup time, data before LE↓	7		8.5		8		ns
t _h	Hold time, data after LE↓	0		1		1		ns



[‡] 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}.

SN54ACT373, **SN74ACT373 OCTAL D-TYPE TRANSPARENT LATCHES** WITH 3-STATE OUTPUTS SCAS544E - OCTOBER 1995 - REVISED OCTOBER 2002

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

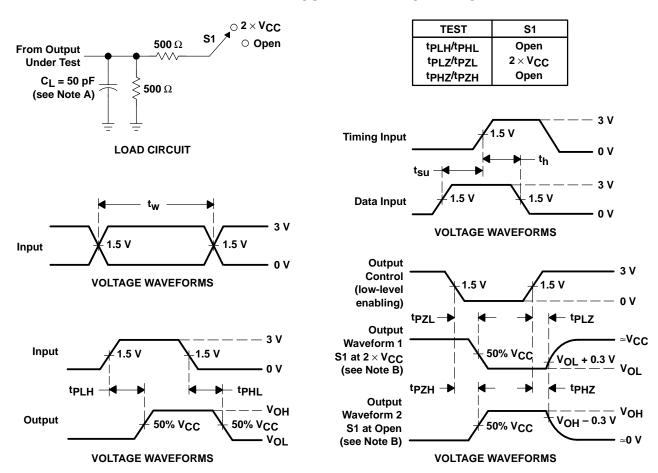
PARAMETER	FROM	то	T,	T _A = 25°C			CT373	SN74ACT373		UNIT
PARAMETER	(INPUT)	(OUTPUT)	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
^t PLH	D	Q	2.5	8.5	10	1.5	12.5	1.5	11.5	nc
^t PHL	Б	ď	2	8	10	1.5	12.5	1.5	11.5	ns
^t PLH	LE	Q	2.5	8.5	11	1.5	12.5	2	11.5	ns
^t PHL	LL		2	8	10	1.5	11.5	1.5	11.5	115
^t PZH	ŌĒ	Q	2	8	9.5	1.5	11.5	1.5	10.5	ns
^t PZL	OE	γ	2	7.5	9	1.5	11	1.5	10.5	110
^t PHZ	ŌĒ	0	2.5	9	11	1.5	14	2.5	12.5	ns
tPLZ	OE	Q	1.5	7.5	8.5	1.5	11	1	10	110

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

	PARAMETER	TEST CO	NDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance	C _L = 50 pF,	f = 1 MHz	40	pF



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, $Z_Q = 50 \ \Omega$, $t_f \leq 2.5 \ ns$, $t_f \leq 2.5 \ ns$.
- D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
5962-87556012A	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 87556012A SNJ54ACT 373FK	Samples
5962-8755601RA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8755601RA SNJ54ACT373J	Samples
5962-8755601SA	ACTIVE	CFP	W	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8755601SA SNJ54ACT373W	Samples
5962-8755601VRA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8755601VR A SNV54ACT373J	Samples
SN74ACT373DBR	ACTIVE	SSOP	DB	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD373	Samples
SN74ACT373DW	ACTIVE	SOIC	DW	20	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT373	Samples
SN74ACT373DWR	ACTIVE	SOIC	DW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT373	Samples
SN74ACT373N	ACTIVE	PDIP	N	20	20	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74ACT373N	Samples
SN74ACT373NSR	ACTIVE	SO	NS	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT373	Samples
SN74ACT373PW	ACTIVE	TSSOP	PW	20	70	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD373	Samples
SN74ACT373PWR	ACTIVE	TSSOP	PW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD373	Samples
SNJ54ACT373FK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 87556012A SNJ54ACT 373FK	Samples
SNJ54ACT373J	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8755601RA SNJ54ACT373J	Samples
SNJ54ACT373W	ACTIVE	CFP	W	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8755601SA SNJ54ACT373W	Samples

(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.

PACKAGE OPTION ADDENDUM

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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) RoHS: TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (CI) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

- (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 finish/Ball material Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF SN54ACT373, SN54ACT373-SP, SN74ACT373:

Catalog: SN74ACT373, SN54ACT373

■ Enhanced Product : SN74ACT373-EP, SN74ACT373-EP

Military: SN54ACT373

Space: SN54ACT373-SP

NOTE: Qualified Version Definitions:



PACKAGE OPTION ADDENDUM

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- Catalog TI's standard catalog product
- Enhanced Product Supports Defense, Aerospace and Medical Applications
- 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



TAPE DIMENSIONS + K0 - P1 - B0 W Cavity - A0 -

	* ' '
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

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
SN74ACT373DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74ACT373DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74ACT373NSR	so	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74ACT373PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1



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*All dimensions are nominal

	til dilitoriorono di o nomina							
	Device Package Type		Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
	SN74ACT373DBR	SSOP	DB	20	2000	356.0	356.0	35.0
	SN74ACT373DWR	SOIC	DW	20	2000	367.0	367.0	45.0
	SN74ACT373NSR	SO	NS	20	2000	367.0	367.0	45.0
I	SN74ACT373PWR	TSSOP	PW	20	2000	356.0	356.0	35.0

PACKAGE MATERIALS INFORMATION

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TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
5962-87556012A	FK	LCCC	20	1	506.98	12.06	2030	NA
5962-8755601SA	W	CFP	20	1	506.98	26.16	6220	NA
SN74ACT373DW	DW	SOIC	20	25	507	12.83	5080	6.6
SN74ACT373N	N	PDIP	20	20	506	13.97	11230	4.32
SN74ACT373PW	PW	TSSOP	20	70	530	10.2	3600	3.5
SNJ54ACT373FK	FK	LCCC	20	1	506.98	12.06	2030	NA
SNJ54ACT373W	W	CFP	20	1	506.98	26.16	6220	NA

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- 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







- 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.





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.





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.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.C. Publication IPC-7351 is recommended for alternate design.
- 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.







- 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-150.





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.





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.



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.



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.

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary. Refer to the product data sheet for package details.



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.





SOIC



- 1. All linear dimensions are in millimeters. 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 0.43 mm per side.
- 5. Reference JEDEC registration MS-013.



SOIC



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.



SOIC



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.



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