

SNx4LVC373A Octal Transparent D-Type Latches With 3-State Outputs

1 Features

- Operate From 1.65 V to 3.6 V
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 6.8 ns at 3.3 V
- Typical V_{OLP} (Output Ground Bounce) <0.8 V at $V_{CC} = 3.3$ V, $T_A = 25^\circ\text{C}$
- Typical V_{OHV} (Output V_{OH} Undershoot) >2 V at $V_{CC} = 3.3$ V, $T_A = 25^\circ\text{C}$
- Supports Mixed-Mode Signal Operation on All Ports (5-V Input/Output Voltage With 3.3-V V_{CC})
- I_{off} Supports Live-Insertion, Partial-Power-Down Mode, and Back-Drive Protection
- 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)
- On Products Compliant to MIL-PRF-38535, All Parameters Are Tested Unless Otherwise Noted. On All Other Products, Production Processing Does Not Necessarily Include Testing of All Parameters.

2 Applications

- Network Switches
- TV Set-top Boxes
- Motor Drives
- PCs and Notebooks

3 Description

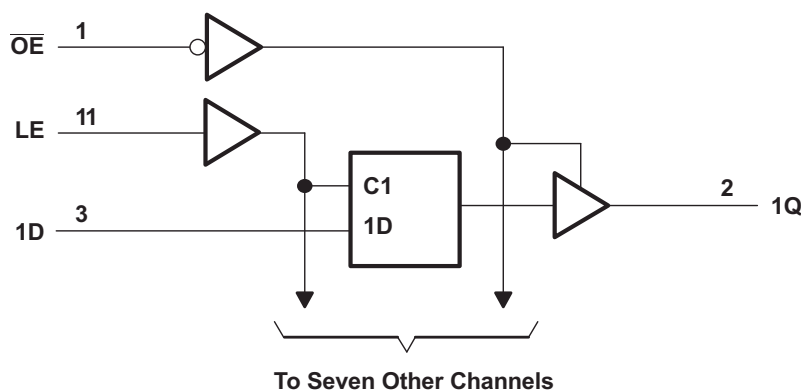
The SN54LVC373A octal transparent D-type latch is designed for 2.7-V to 3.6-V V_{CC} operation, and the SN74LVC373A octal transparent D-type latch is designed for 1.65-V to 3.6-V V_{CC} operation.

Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SNx4LVC373A	SSOP (20)	7.20 mm × 5.30 mm
	SOIC (20)	12.80 mm × 7.50 mm
	PDIP (20)	24.33 mm × 6.35 mm
	TSSOP (20)	6.50 mm × 4.40 mm
	VQFN (20)	4.50 mm × 3.50 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

4 Simplified Schematic



Pin numbers shown are for the DB, DGV, DW, FK, J, N, NS, PW, RGY, and W packages.



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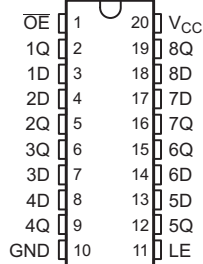
5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

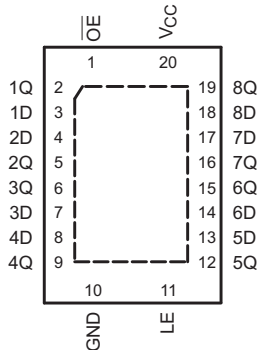
Changes from Revision S (May 2005) to Revision T	Page
• Updated document to new TI data sheet format	1
• Removed Ordering Information table	1
• Changed I _{off} Feature	1
• Added Military Disclaimer to Features	1
• Added Applications	1
• Added Handling Ratings table	4
• Changed MAX ambient temperature from 85°C to 125°C	5
• Added Thermal Information table	5
• Added Typical Characteristics	7
• Added Detailed Description section	9

6 Pin Configuration and Functions

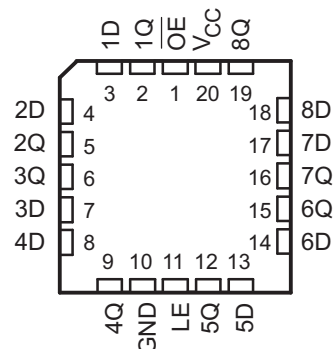
SN54LVC373A . . . J OR W PACKAGE
SN74LVC373A . . . DB, DGV, DW, N,
NS, OR PW PACKAGE
(TOP VIEW)



SN74LVC373A . . . RGY PACKAGE
(TOP VIEW)



SN54LVC373A . . . FK PACKAGE
(TOP VIEW)



Pin Functions

PIN		I/O	DESCRIPTION
NO.	NAME		
1	\overline{OE}	I	Enable Pin
2	1Q	O	Output 1
3	1D	I	Input 1
4	2D	I	Input 2
5	2Q	O	Output 2
6	3Q	O	Output 3
7	3D	I	Input 3
8	4D	I	Input 4
9	4Q	O	Output 4
10	GND	–	Ground Pin
11	LE	I	Latch Enable
12	5Q	O	Output 5
13	5D	I	Input 5
14	6D	I	Input 6
15	6Q	O	Output 6
16	7Q	O	Output 7
17	7D	I	Input 7
18	8D	I	Input 8
19	8Q	O	Output 8
20	VCC	–	Power Pin

GQN OR ZQN PACKAGE
(TOP VIEW)

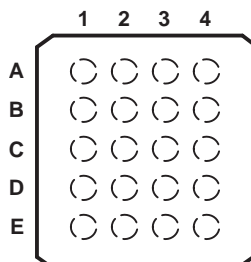


Table 1. Pin Assignments

	1	2	3	4
A	1Q	\overline{OE}	V _{CC}	8Q
B	2D	7D	1D	8D
C	3Q	2Q	6Q	7Q
D	4D	5D	3D	6D
E	GND	4Q	LE	5Q

7 Specifications

7.1 Absolute Maximum Ratings⁽¹⁾

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

		MIN	MAX	UNIT
V _{CC}	Supply voltage range	-0.5	6.5	V
V _I	Input voltage range ⁽²⁾	-0.5	6.5	V
V _O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	-0.5	6.5	V
V _O	Voltage range applied to any output in the high or low state ⁽²⁾⁽³⁾	-0.5	V _{CC} + 0.5	V
I _{IK}	Input clamp current	V _I < 0	-50	mA
I _{OK}	Output clamp current	V _O < 0	-50	mA
I _O	Continuous output current		±50	mA
	Continuous current through V _{CC} or GND		±100	mA

- (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 current ratings are observed.
- (3) The value of V_{CC} is provided in the *Recommended Operating Conditions* table.

7.2 Handling Ratings

		MIN	MAX	UNIT	
T _{stg}	Storage temperature range	-65	150	°C	
V _(ESD)	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins ⁽¹⁾	0	2000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins ⁽²⁾	0	1000	

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

7.3 Recommended Operating Conditions

 over operating free-air temperature range (unless otherwise noted)⁽¹⁾

			SN54LVC373A		SN74LVC373A		UNIT
			MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage	Operating	2	3.6	1.65	3.6	V
		Data retention only	1.5		1.5		
V _{IH}	High-level input voltage	V _{CC} = 1.65 V to 1.95 V			0.65 × V _{CC}		V
		V _{CC} = 2.3 V to 2.7 V			1.7		
		V _{CC} = 2.7 V to 3.6 V	2		2		
V _{IL}	Low-level input voltage	V _{CC} = 1.65 V to 1.95 V			0.35 × V _{CC}		V
		V _{CC} = 2.3 V to 2.7 V			0.7		
		V _{CC} = 2.7 V to 3.6 V		0.8	0.8		
V _I	Input voltage	0	5.5	0	5.5	V	
V _O	Output voltage	High or low state	0	V _{CC}	0	V _{CC}	V
		3-state	0	5.5	0	5.5	
I _{OH}	High-level output current	V _{CC} = 1.65 V				–4	mA
		V _{CC} = 2.3 V				–8	
		V _{CC} = 2.7 V		–12		–12	
		V _{CC} = 3 V		–24		–24	
I _{OL}	Low-level output current	V _{CC} = 1.65 V				4	mA
		V _{CC} = 2.3 V				8	
		V _{CC} = 2.7 V		12		12	
		V _{CC} = 3 V		24		24	
Δt/Δv	Input transition rise or fall rate		10		10	ns/V	
T _A	Operating free-air temperature	–55	125	–40	125	°C	

(1) 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*, (SCBA004).

7.4 Thermal Information

THERMAL METRIC ⁽¹⁾		SN74LVC373A	UNIT
		PW	
		20 PINS	
R _{θJA}	Junction-to-ambient thermal resistance	102.5	°C/W
R _{θJC(top)}	Junction-to-case (top) thermal resistance	35.9	
R _{θJB}	Junction-to-board thermal resistance	53.5	
ψ _{JT}	Junction-to-top characterization parameter	2.2	
ψ _{JB}	Junction-to-board characterization parameter	52.9	
R _{θJC(bot)}	Junction-to-case (bottom) thermal resistance	n/a	

(1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report, [SPRA953](#).

7.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V _{CC}	SN54LVC373A			SN74LVC373A			UNIT	
			MIN	TYP ⁽¹⁾	MAX	MIN	TYP ⁽¹⁾	MAX		
V _{OH}	I _{OH} = -100 μA	1.65 V to 3.6 V				V _{CC} - 0.2			V	
		2.7 V to 3.6 V	V _{CC} - 0.2							
	I _{OH} = -4 mA	1.65 V			1.2					
	I _{OH} = -8 mA	2.3 V			1.7					
	I _{OH} = -12 mA	2.7 V			2.2					
3 V			2.4							
V _{OL}	I _{OL} = 100 μA	1.65 V to 3.6 V				0.2			V	
		2.7 V to 3.6 V				0.2				
	I _{OL} = 4 mA	1.65 V			0.45					
	I _{OL} = 8 mA	2.3 V			0.7					
	I _{OL} = 12 mA	2.7 V			0.4					
3 V			0.55							
I _I	V _I = 0 to 5.5 V	3.6 V			±5			μA		
I _{off}	V _I or V _O = 5.5 V	0						±10	μA	
I _{OZ}	V _O = 0 to 5.5 V	3.6 V			±15			±10	μA	
I _{CC}	V _I = V _{CC} or GND	I _O = 0	3.6 V			10			10	μA
	3.6 V ≤ V _I ≤ 5.5 V ⁽²⁾					10				
ΔI _{CC}	One input at V _{CC} - 0.6 V, Other inputs at V _{CC} or GND	2.7 V to 3.6 V			500			500	μA	
C _i	V _I = V _{CC} or GND	3.3 V			4 12		4		pF	
C _o	V _O = V _{CC} or GND	3.3 V			5.5 12		5.5		pF	

 (1) All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

(2) This applies in the disabled state only.

7.6 Timing Requirements, SN54LVC373A

 over recommended operating free-air temperature range (unless otherwise noted) (see [Figure 3](#))

PARAMETER	SN54LVC373A				UNIT
	V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		
	MIN	MAX	MIN	MAX	
t _w	Pulse duration, LE high				ns
t _{su}	Setup time, data before LE↓				ns
t _h	Hold time, data after LE↓				ns

7.7 Timing Requirements, SN74LVC373A

 over recommended operating free-air temperature range (unless otherwise noted) (see [Figure 3](#))

PARAMETER	SN74LVC373A								UNIT
	V _{CC} = 1.8 V ± 0.15 V		V _{CC} = 2.5 V ± 0.2 V		V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _w	Pulse duration, LE high								ns
t _{su}	Setup time, data before LE↓								ns
t _h	Hold time, data after LE↓								ns

7.8 Switching Characteristics, SN54LVC373A

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54LVC373A				UNIT
			V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		
			MIN	MAX	MIN	MAX	
t _{pd}	D	Q	8.5		1	7.5	ns
	LE		9.5		1	8.5	
t _{en}	\overline{OE}	Q	8.7		1	7.7	ns
t _{dis}	\overline{OE}	Q	8		0.5	7	ns

7.9 Switching Characteristics, SN74LVC373A

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN74LVC373A								UNIT
			V _{CC} = 1.8 V ± 0.15 V		V _{CC} = 2.5 V ± 0.2 V		V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd}	D	Q	1	19.1	1	9.6	7.8		1.5	6.8	ns
	LE		1	22.8	1	10.5	8.2		2	7.6	
t _{en}	\overline{OE}	Q	1	20	1	10.5	8.7		1.5	7.7	ns
t _{dis}	\overline{OE}	Q	1	19.3	1	7.8	7.6		1.5	7	ns
t _{sk(o)}			1		1		1		1		ns

7.10 Operating Characteristics

T_A = 25°C

PARAMETER			TEST CONDITIONS	V _{CC} = 1.8 V	V _{CC} = 2.5 V	V _{CC} = 3.3 V	UNIT
				TYP	TYP	TYP	
C _{pd}	Power dissipation capacitance per latch	Outputs enabled	f = 10 MHz	61	56	46	pF
		Outputs disabled		3	3	3	

7.11 Typical Characteristics

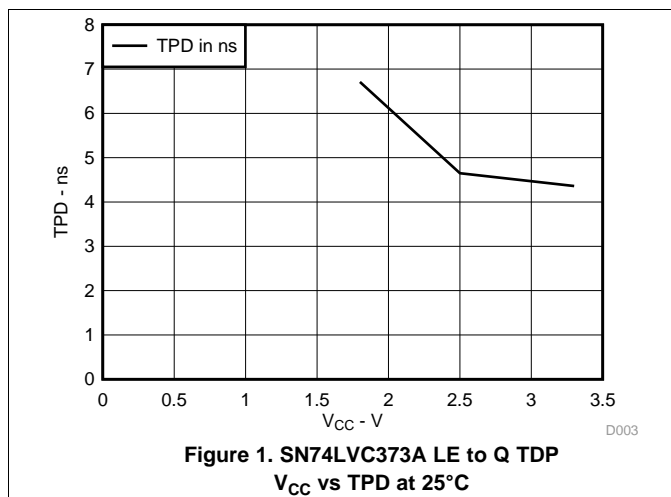


Figure 1. SN74LVC373A LE to Q TDP V_{CC} vs TPD at 25°C

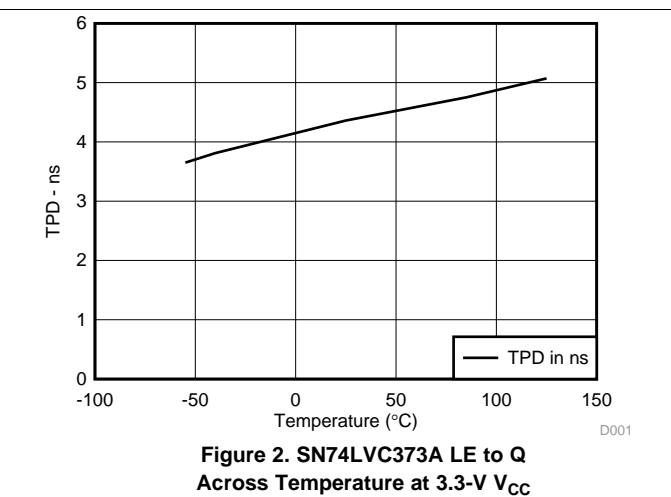
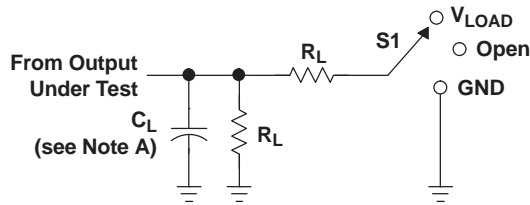


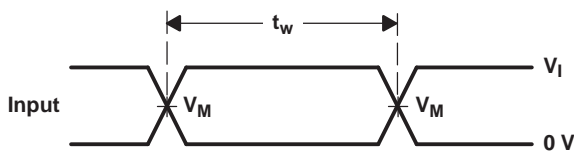
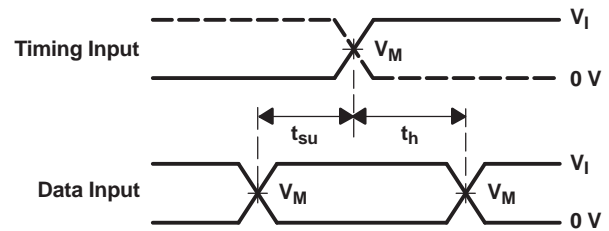
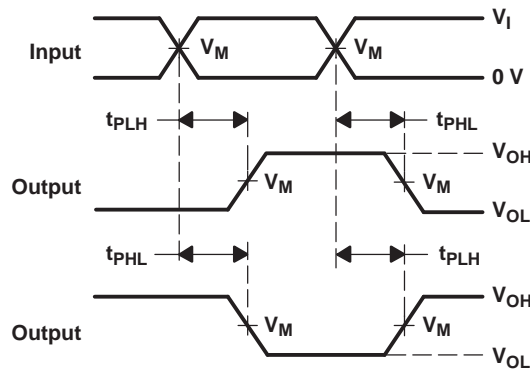
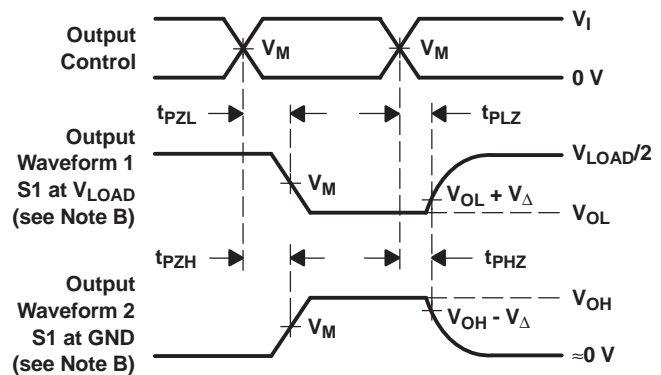
Figure 2. SN74LVC373A LE to Q TPD Across Temperature at 3.3-V V_{CC}

8 Parameter Measurement Information


LOAD CIRCUIT

TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_I	t_r/t_f					
$1.8\text{ V} \pm 0.15\text{ V}$	V_{CC}	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	1 k Ω	0.15 V
$2.5\text{ V} \pm 0.2\text{ V}$	V_{CC}	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	500 Ω	0.15 V
2.7 V	2.7 V	$\leq 2.5\text{ ns}$	1.5 V	6 V	50 pF	500 Ω	0.3 V
$3.3\text{ V} \pm 0.3\text{ V}$	2.7 V	$\leq 2.5\text{ ns}$	1.5 V	6 V	50 pF	500 Ω	0.3 V


**VOLTAGE WAVEFORMS
PULSE DURATION**

**VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES**

**VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS**

**VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING**

- NOTES:
- C_L includes probe and jig capacitance.
 - 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.
 - All input pulses are supplied by generators having the following characteristics: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$.
 - The outputs are measured one at a time, with one transition per measurement.
 - t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - t_{PZL} and t_{PZH} are the same as t_{en} .
 - t_{PLH} and t_{PHL} are the same as t_{pd} .
 - All parameters and waveforms are not applicable to all devices.

Figure 3. Load Circuit and Voltage Waveforms

9 Detailed Description

9.1 Overview

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 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 without interface or pullup components.

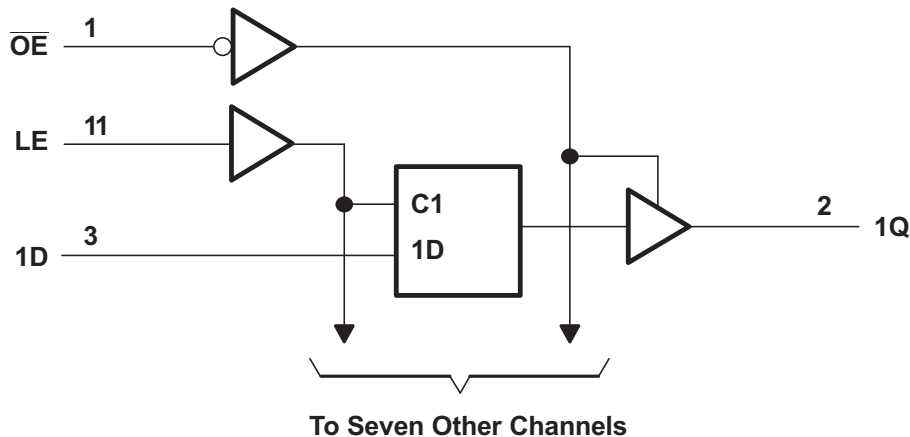
\overline{OE} does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

These devices are fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the devices when they are powered down.

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.

Inputs can be driven from either 3.3-V or 5-V devices. This feature allows the use of these devices as translators in a mixed 3.3-V/5-V system environment.

9.2 Functional Block Diagram



Pin numbers shown are for the DB, DGV, DW, FK, J, N, NS, PW, RGY, and W packages.

9.3 Feature Description

- Wide operating voltage range
 - Operates from 1.65 V to 3.6 V
- Allows down voltage translation
 - Inputs accept voltages to 5.5 V
- I_{off} feature
 - Allows voltages on the inputs and outputs when V_{CC} is 0 V

9.4 Device Functional Modes

Table 2. Function Table (Each Latch)

INPUTS			OUTPUT Q
\overline{OE}	LE	D	
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

10 Application and Implementation

10.1 Application Information

The SN74LVC373A is a high-drive CMOS device that can be used for a multitude of bus-interface type applications where the data needs to be retained or latched. It can produce 24 mA of drive current at 3.3 V. Therefore, this device is ideal for driving multiple outputs and for high speed applications up to 100 Mhz. The inputs are 5.5 V tolerant allowing it to translate down to V_{CC} .

10.2 Typical Application

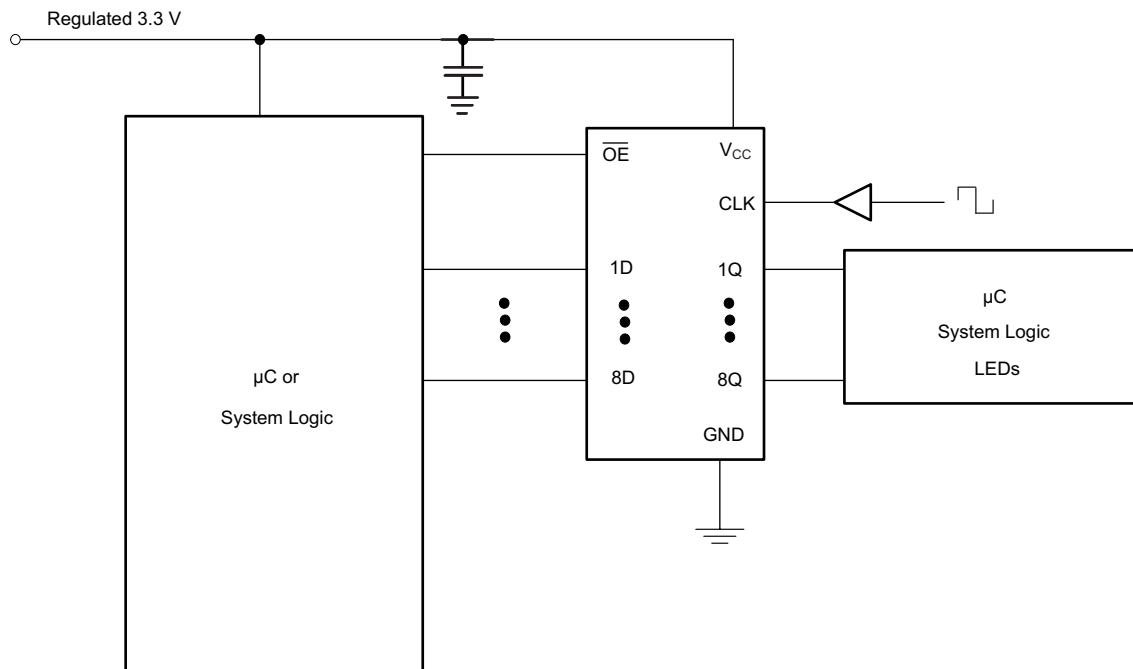


Figure 4. Typical Application Diagram

10.2.1 Design Requirements

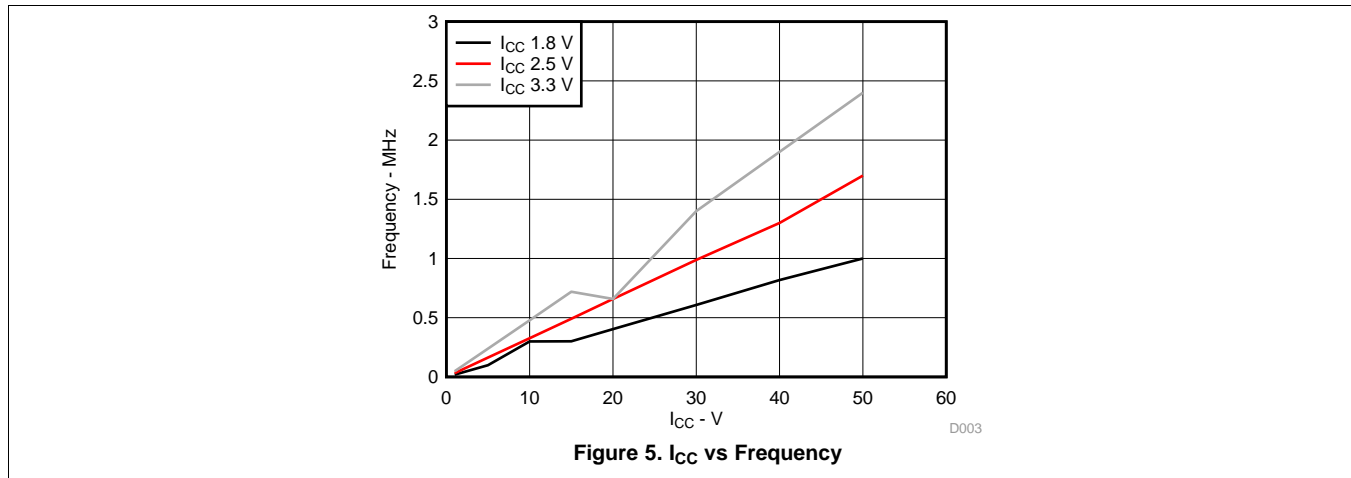
This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive will also create fast edges into light loads; therefore, routing and load conditions should be considered to prevent ringing.

10.2.2 Detailed Design Procedure

1. Recommended Input Conditions
 - Rise time and fall time specs: See $(\Delta t/\Delta V)$ in the [Recommended Operating Conditions](#) table.
 - Specified high and low levels: See $(V_{IH}$ and $V_{IL})$ in the [Recommended Operating Conditions](#) table.
 - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid V_{CC} .
2. Recommend Output Conditions
 - Load currents should not exceed 50 mA per output and 100 mA total for the part.
 - Outputs should not be pulled above V_{CC} .

Typical Application (continued)

10.2.3 Application Curves



11 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [Recommended Operating Conditions](#) table.

Each V_{CC} pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1 μf is recommended; if there are multiple V_{CC} pins, then 0.01 μf or 0.022 μf is recommended for each power pin. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. A 0.1 μf and a 1 μf are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

12 Layout

12.1 Layout Guidelines

When using multiple bit logic devices inputs should never float.

In many cases, functions or parts of functions of digital logic devices are unused, for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. [Figure 6](#) specifies the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or V_{CC} , whichever makes more sense or is more convenient. It is generally acceptable to float outputs, unless the part is a transceiver.

12.2 Layout Example

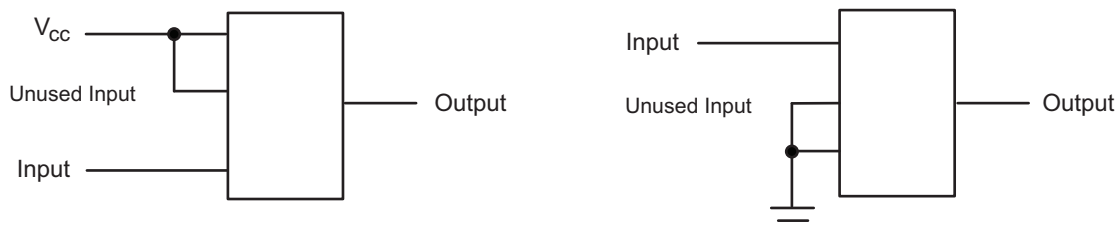


Figure 6. Layout Diagram

13 Device and Documentation Support

13.1 Related Links

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

Table 3. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54LVC373A	Click here	Click here	Click here	Click here	Click here
SN74LVC373A	Click here	Click here	Click here	Click here	Click here

13.2 Trademarks

All trademarks are the property of their respective owners.

13.3 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

13.4 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

14 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
5962-9757301Q2A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9757301Q2A SNJ54LVC 373AFK
5962-9757301QRA	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9757301QR A SNJ54LVC373AJ
5962-9757301QSA	Active	Production	CFP (W) 20	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9757301QS A SNJ54LVC373AW
SN74LVC373ADBR	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADBR.A	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADBR.B	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADBRG4	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADBRG4.A	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADBRG4.B	Active	Production	SSOP (DB) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADGVR	Active	Production	TVSOP (DGV) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADGVR.B	Active	Production	TVSOP (DGV) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADGVRG4	Active	Production	TVSOP (DGV) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADGVRG4.B	Active	Production	TVSOP (DGV) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ADW	Active	Production	SOIC (DW) 20	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373ADW.B	Active	Production	SOIC (DW) 20	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373ADWR	Active	Production	SOIC (DW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373ADWR.A	Active	Production	SOIC (DW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373ADWR.B	Active	Production	SOIC (DW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373AN	Active	Production	PDIP (N) 20	20 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74LVC373AN
SN74LVC373AN.B	Active	Production	PDIP (N) 20	20 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74LVC373AN
SN74LVC373ANSR	Active	Production	SOP (NS) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373ANSR.B	Active	Production	SOP (NS) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LVC373A
SN74LVC373APW	Active	Production	TSSOP (PW) 20	70 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APW.B	Active	Production	TSSOP (PW) 20	70 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN74LVC373APWE4	Active	Production	TSSOP (PW) 20	70 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWG4	Active	Production	TSSOP (PW) 20	70 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWR	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWR.A	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWR.B	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWRG4	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWRG4.A	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWRG4.B	Active	Production	TSSOP (PW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWT	Active	Production	TSSOP (PW) 20	250 SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373APWT.B	Active	Production	TSSOP (PW) 20	250 SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LC373A
SN74LVC373ARGYR	Active	Production	VQFN (RGY) 20	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LC373A
SN74LVC373ARGYR.A	Active	Production	VQFN (RGY) 20	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LC373A
SN74LVC373ARGYR.B	Active	Production	VQFN (RGY) 20	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LC373A
SN74LVC373ARGYRG4.A	Active	Production	VQFN (RGY) 20	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LC373A
SN74LVC373ARGYRG4.B	Active	Production	VQFN (RGY) 20	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LC373A
SNJ54LVC373AFK	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9757301Q2A SNJ54LVC 373AFK
SNJ54LVC373AJ	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9757301QR A SNJ54LVC373AJ
SNJ54LVC373AW	Active	Production	CFP (W) 20	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9757301QS A SNJ54LVC373AW

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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.

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 SN54LVC373A, SN74LVC373A :

- Catalog : [SN74LVC373A](#)
- Enhanced Product : [SN74LVC373A-EP](#), [SN74LVC373A-EP](#)
- Military : [SN54LVC373A](#)

NOTE: Qualified Version Definitions:

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

TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

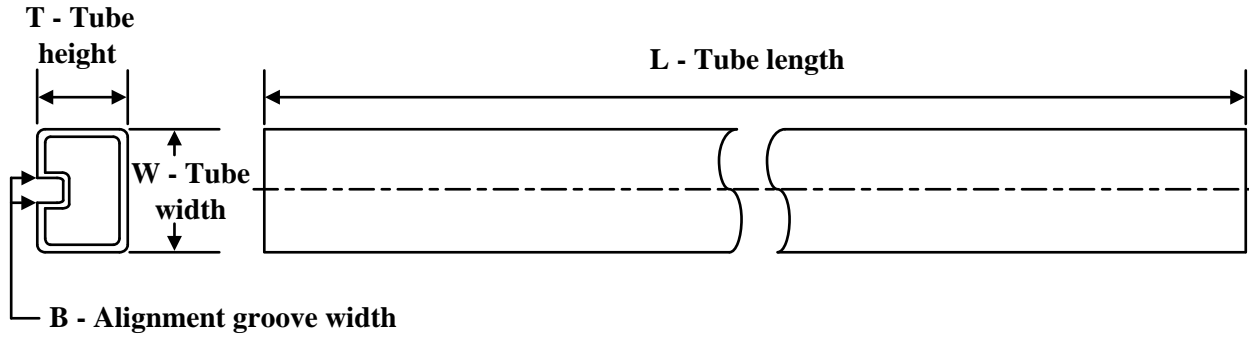

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LVC373ADBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74LVC373ADBRG4	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74LVC373ADGVR	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LVC373ADGVRG4	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LVC373ADWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74LVC373ANSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74LVC373APWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74LVC373APWRG4	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74LVC373APWT	TSSOP	PW	20	250	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
SN74LVC373ARGYR	VQFN	RGY	20	3000	330.0	12.4	3.8	4.8	1.6	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC373ADBR	SSOP	DB	20	2000	356.0	356.0	35.0
SN74LVC373ADBRG4	SSOP	DB	20	2000	356.0	356.0	35.0
SN74LVC373ADGVR	TVSOP	DGV	20	2000	356.0	356.0	35.0
SN74LVC373ADGVRG4	TVSOP	DGV	20	2000	356.0	356.0	35.0
SN74LVC373ADWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74LVC373ANSR	SOP	NS	20	2000	367.0	367.0	45.0
SN74LVC373APWR	TSSOP	PW	20	2000	356.0	356.0	35.0
SN74LVC373APWRG4	TSSOP	PW	20	2000	356.0	356.0	35.0
SN74LVC373APWT	TSSOP	PW	20	250	356.0	356.0	35.0
SN74LVC373ARGYR	VQFN	RGY	20	3000	356.0	356.0	35.0

TUBE


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-9757301Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9757301QSA	W	CFP	20	25	506.98	26.16	6220	NA
SN74LVC373ADW	DW	SOIC	20	25	507	12.83	5080	6.6
SN74LVC373ADW.B	DW	SOIC	20	25	507	12.83	5080	6.6
SN74LVC373AN	N	PDIP	20	20	506	13.97	11230	4.32
SN74LVC373AN.B	N	PDIP	20	20	506	13.97	11230	4.32
SN74LVC373APW	PW	TSSOP	20	70	530	10.2	3600	3.5
SN74LVC373APW.B	PW	TSSOP	20	70	530	10.2	3600	3.5
SN74LVC373APWE4	PW	TSSOP	20	70	530	10.2	3600	3.5
SN74LVC373APWG4	PW	TSSOP	20	70	530	10.2	3600	3.5
SNJ54LVC373AFK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LVC373AW	W	CFP	20	25	506.98	26.16	6220	NA

DB0020A



PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



4214851/B 08/2019

NOTES:

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.

EXAMPLE BOARD LAYOUT

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4214851/B 08/2019

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.

EXAMPLE STENCIL DESIGN

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4214851/B 08/2019

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**)

PLASTIC SMALL-OUTLINE PACKAGE

14-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.

J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package is hermetically sealed with a ceramic lid using glass frit.
 - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
 - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

24 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 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194

GENERIC PACKAGE VIEW

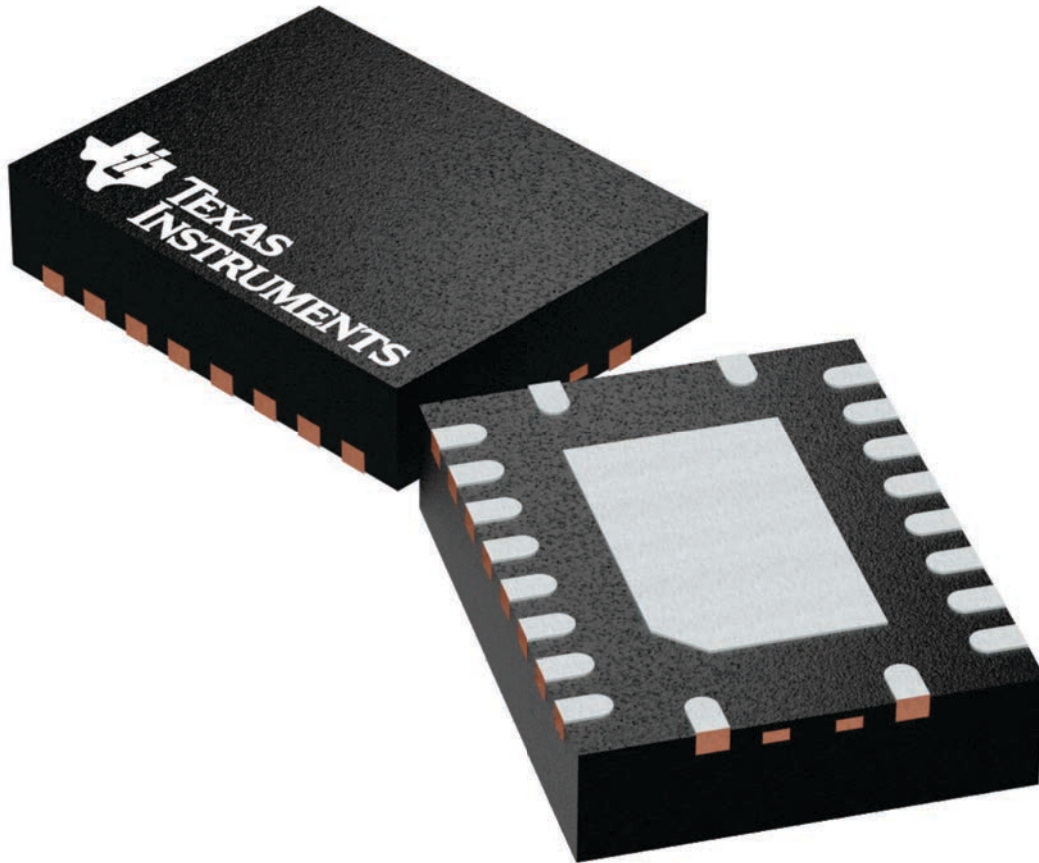
RGY 20

VQFN - 1 mm max height

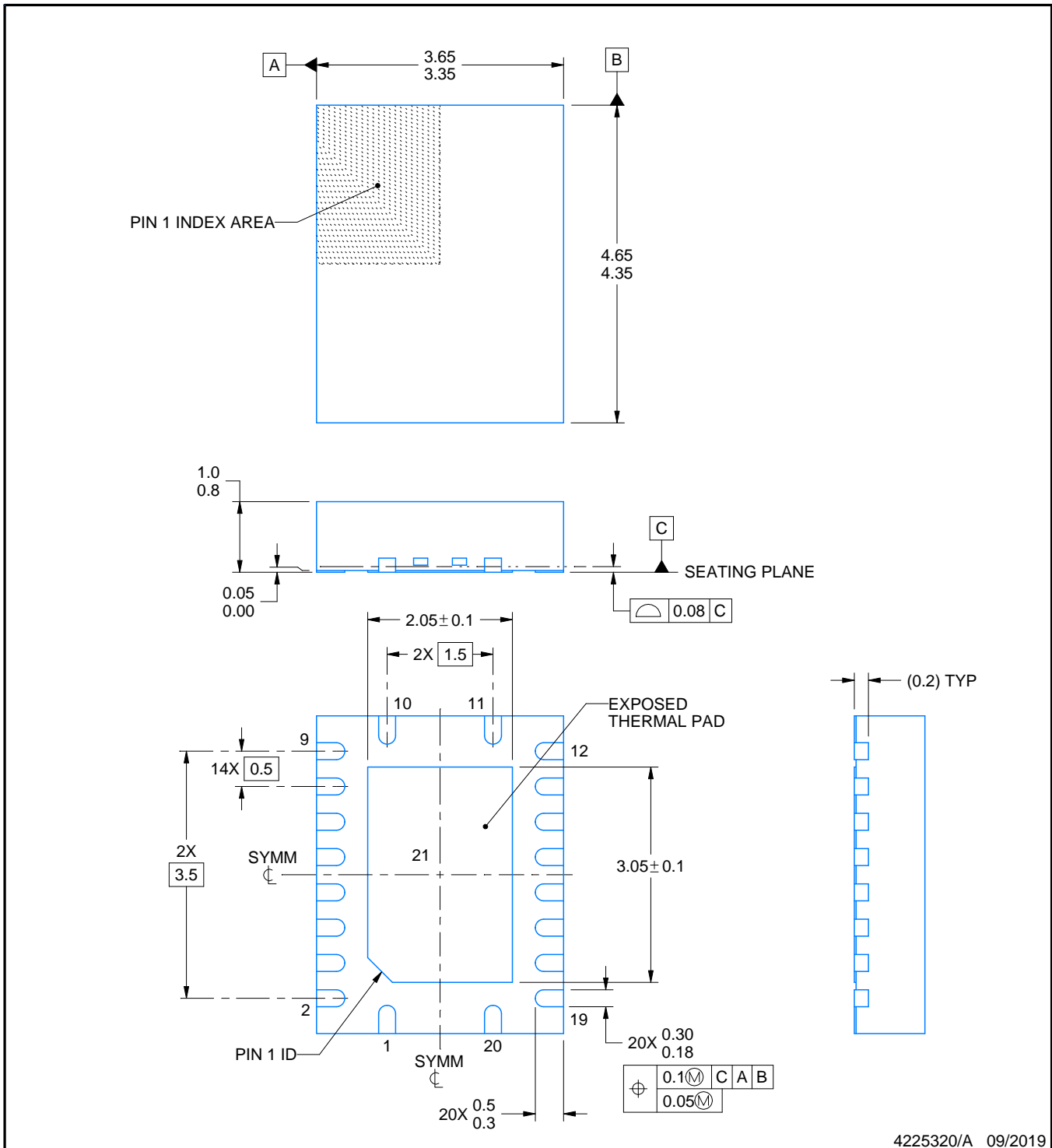
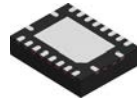
3.5 x 4.5, 0.5 mm pitch

PLASTIC QUAD FGLATPACK - NO LEAD

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



4225264/A



4225320/A 09/2019

NOTES:

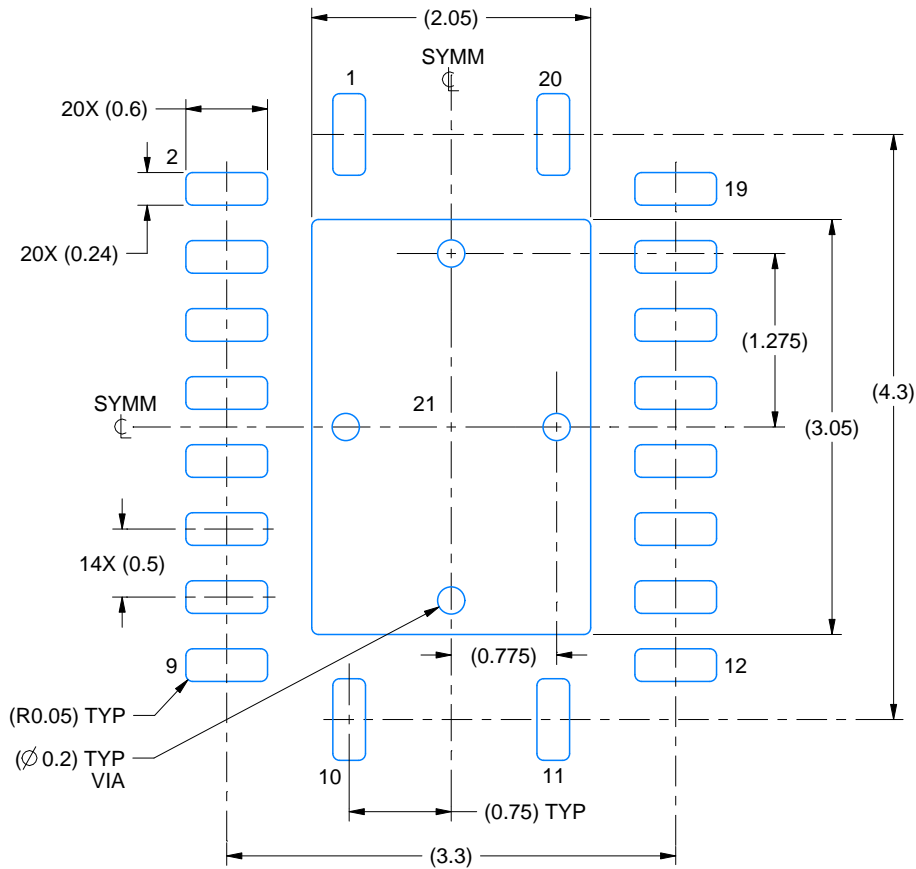
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

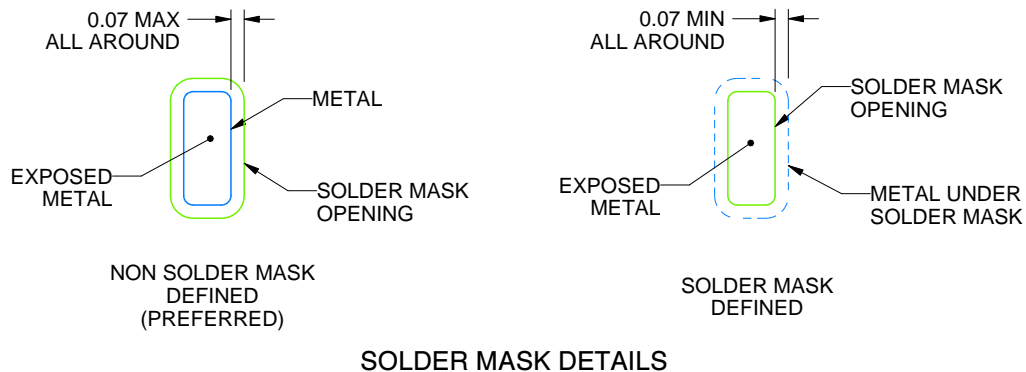
RGY0020A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:18X



SOLDER MASK DETAILS

4225320/A 09/2019

NOTES: (continued)

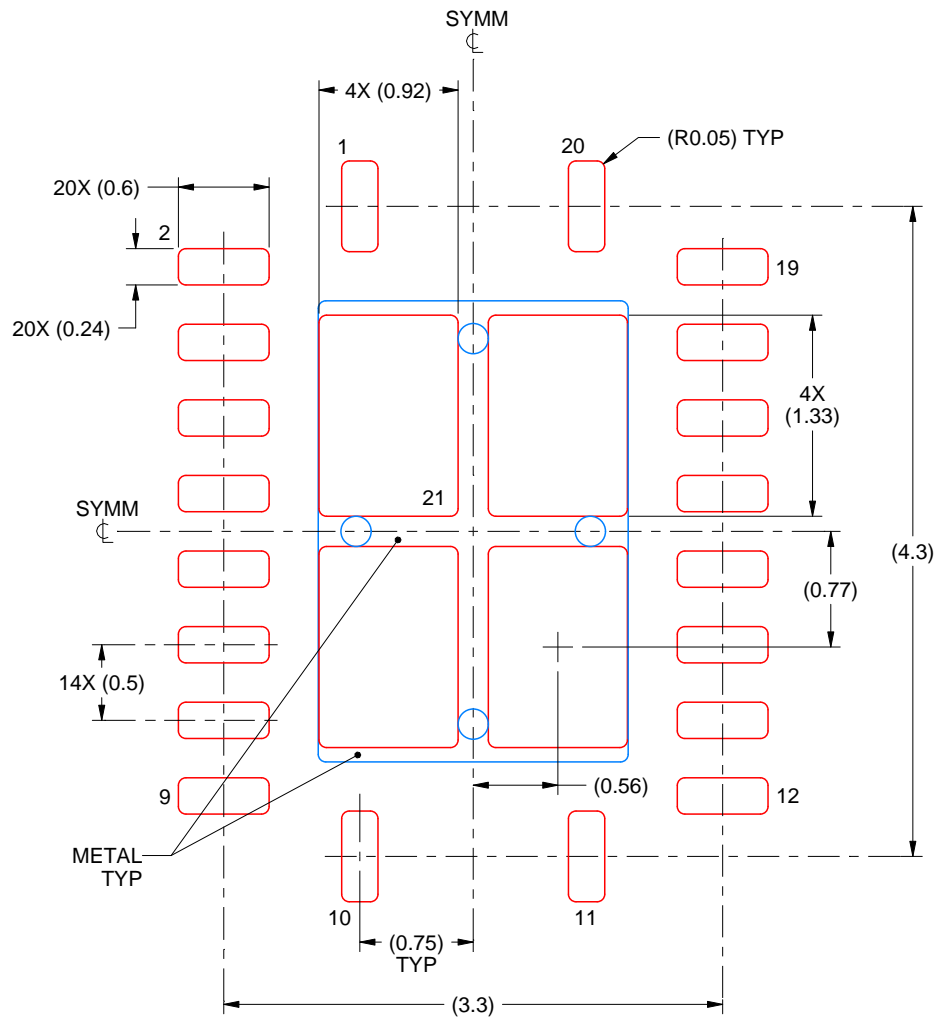
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

EXAMPLE STENCIL DESIGN

RGY0020A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD 21
78% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
SCALE:20X

4225320/A 09/2019

NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

GENERIC PACKAGE VIEW

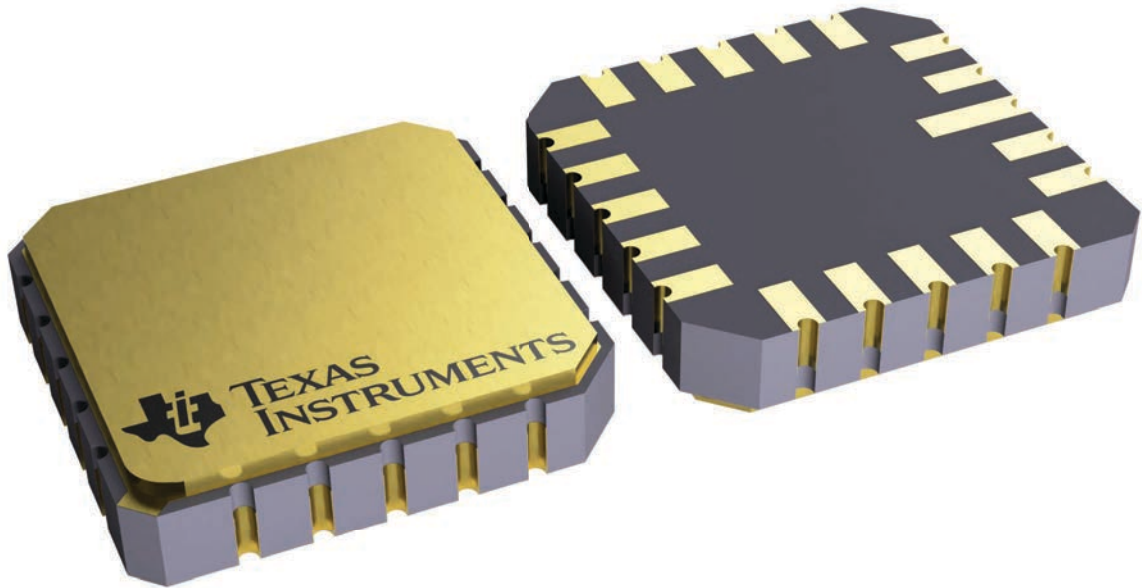
FK 20

LCCC - 2.03 mm max height

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.



4229370VA\

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).
 - The 20 pin end lead shoulder width is a vendor option, either half or full width.

DW0020A



PACKAGE OUTLINE

SOIC - 2.65 mm max height

SOIC



4220724/A 05/2016

NOTES:

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.

EXAMPLE BOARD LAYOUT

DW0020A

SOIC - 2.65 mm max height

SOIC



LAND PATTERN EXAMPLE
SCALE:6X



SOLDER MASK DETAILS

4220724/A 05/2016

NOTES: (continued)

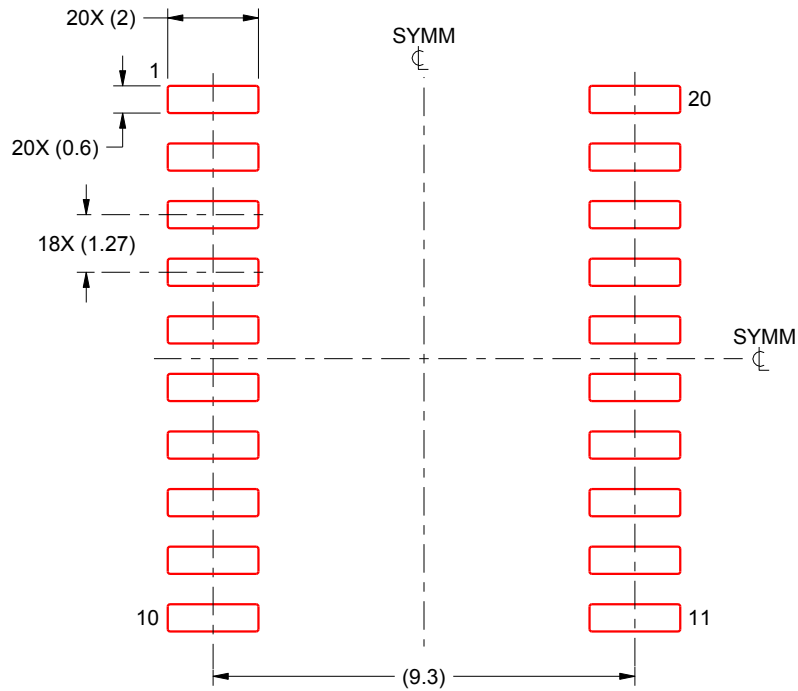
- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:6X

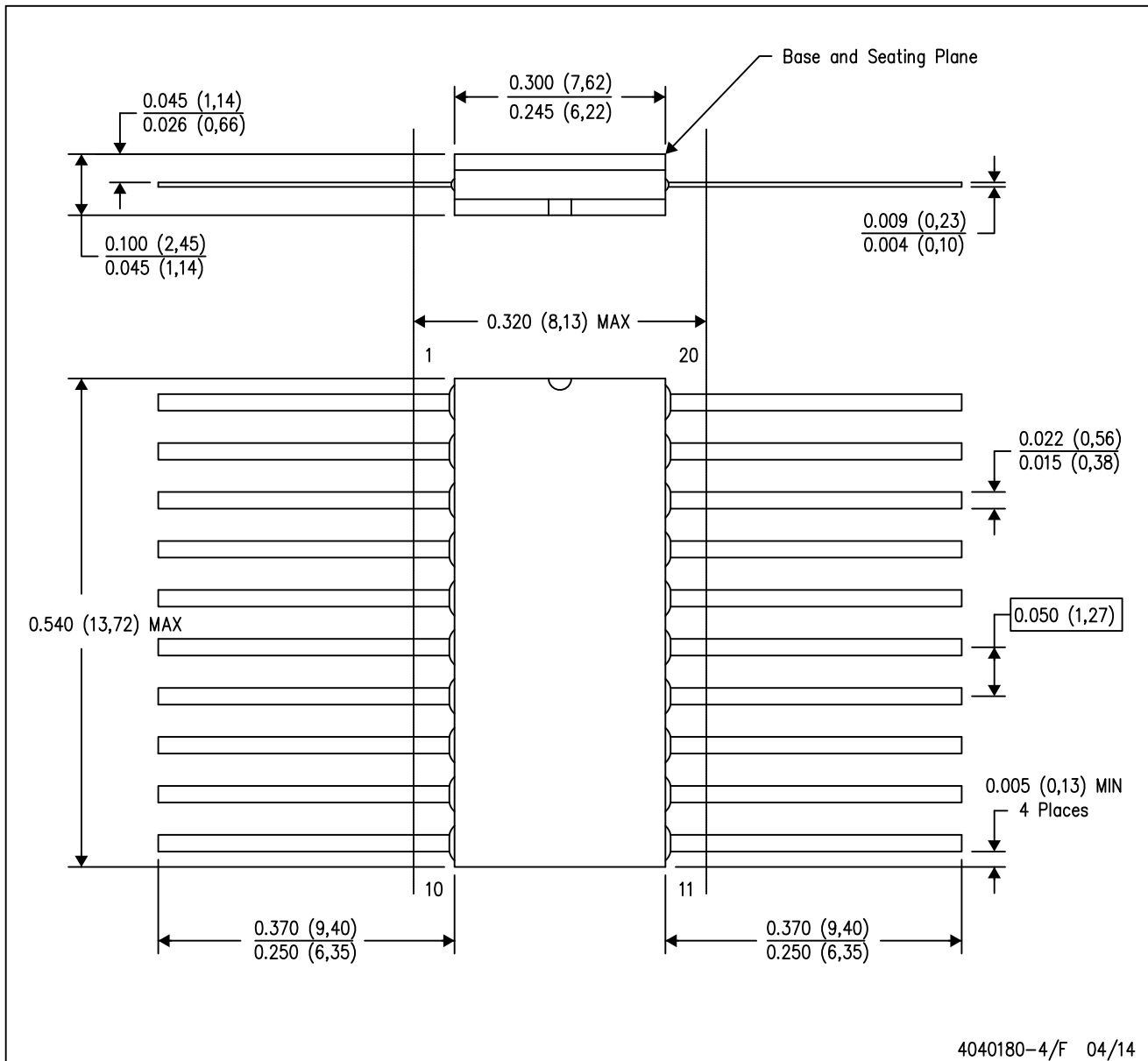
4220724/A 05/2016

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.

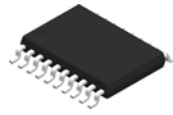
W (R-GDFP-F20)

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 GDFP2-F20

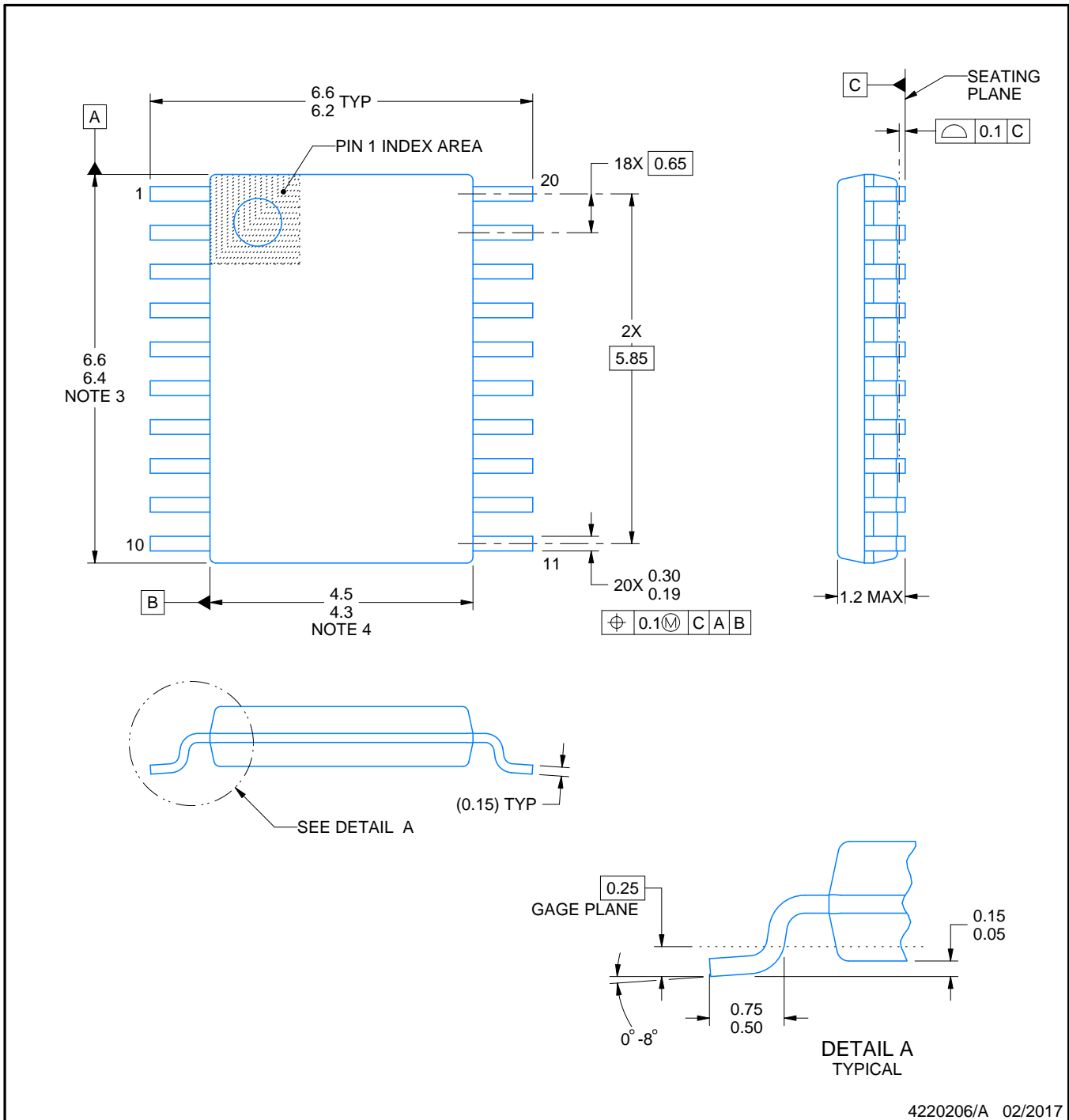
PW0020A



PACKAGE OUTLINE

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



4220206/A 02/2017

NOTES:

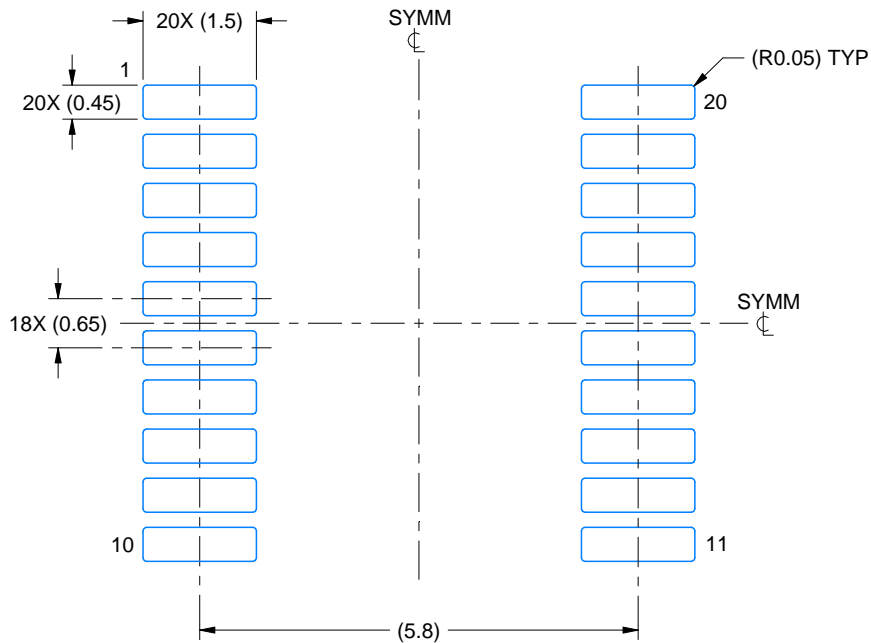
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or 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.

EXAMPLE BOARD LAYOUT

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

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NOTES: (continued)

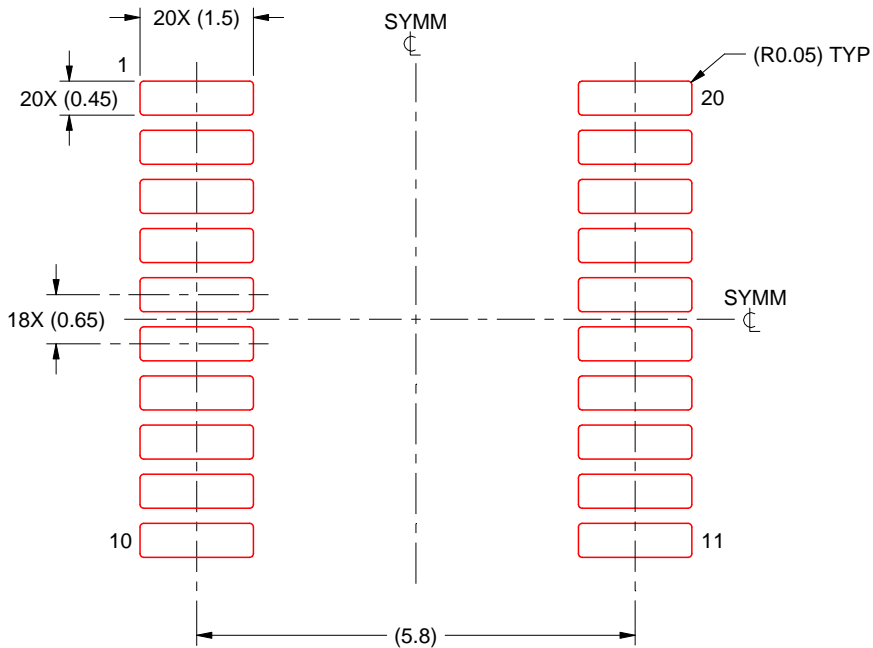
- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

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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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