



## CD74AC540, CDx4ACT54x, CDx4AC541 Octal Buffer/Line Drivers, 3-State

### 1 Features

- SCR-latchup-resistant CMOS process and circuit design
- Speed of bipolar FAST<sup>®</sup>/AS/S with significantly reduced power consumption
- Balanced propagation delays
- AC types feature 1.5V to 5.5V operation and balanced noise immunity at 30% of the supply.
- $\pm 24\text{mA}$  output drive current
  - Fanout to 15 FAST<sup>®</sup>ICs
  - Drives 50Ohm transmission lines

CMOS technology. The CD54/74AC/ACT540 are inverting 3-state buffers having two active-LOW output enables. The CD54/74AC/ACT541 are non-inverting 3-state buffers having two active-LOW output enables.

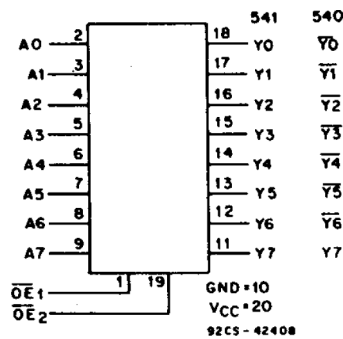
#### Device Information

PART NUMBER	PACKAGE <sup>(1)</sup>	PACKAGE SIZE <sup>(2)</sup>	BODY SIZE <sup>(3)</sup>
CD74AC540, CDx4ACT54x, CDx4AC541	DW (SOIC, 20)	12.8mm x 10.3mm	12.8mm x 7.5mm
	DB (SSOP, 20)	7.2mm x 7.8mm	7.2mm x 5.3mm
	N (PDIP, 20)	24.33mm x 9.4mm	24.33mm x 6.35mm

- (1) For all available packages, see [Section 10](#).
- (2) The package size (length x width) is a nominal value and includes pins, where applicable.
- (3) The body size (length x width) is a nominal value and does not include pins.

### 2 Description

The CD54/74AC540, -541, and CD54/74ACT540, -541 octal buffer/line drivers use the RCA ADVANCED



Functional Block Diagram



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# 3 Pin Configuration and Functions

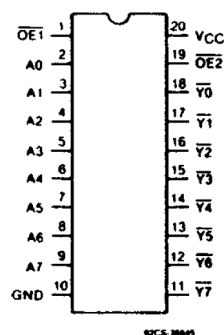


Figure 3-1. CDx4AC540, CDx4ACT540

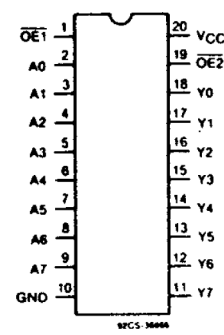


Figure 3-2. CDx4AC541, CDx4ACT541

Table 3-1. Pin Functions

PIN			
NO.	NAME	I/O <sup>1</sup>	DESCRIPTION
!MR	1	I	Master reset, active low
Q0	2	O	Output Q0
D0	3	I	Input D0
D1	4	I	Input D1
Q1	5	O	Output Q1
Q2	6	O	Output Q2
D2	7	I	Input D2
D3	8	I	Input D3
Q3	9	O	Output Q3
GND	10	-	Ground
CP	11	I	Clock, rising edge triggered
Q4	12	O	Output Q4
D4	13	I	Input D4
D5	14	I	Input D5
Q5	15	O	Output Q5
Q6	16	O	Output Q6
D6	17	I	Input D6
D7	18	I	Input D7
Q7	19	O	Output Q7
V <sub>CC</sub>	20	-	Supply

1. I = input, O = output, P = power, FB = feedback, GND = ground, N/A = not applicable

## 4 Specifications

### 4.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
$V_{CC}$	Supply voltage	-0.5	6	V
$I_{IK}$	Input diode current ( $V_I < -0.5$ or $V_I > V_{CC} + 0.5$ V)		$\pm 20$	mA
$I_{OK}$	Output diode current ( $V_O < -0.5$ or $V_O > V_{CC} + 0.5$ V)		$\pm 50$	mA
$I_O$	Output source or sink current per output PIN ( $V_O > -0.5$ or $V_O < V_{CC} + 0.5$ V)		$\pm 50$	mA
	$V_{CC}$ or ground current, $I_{CC}$ or $I_{GND}$ <sup>(1)</sup>		$\pm 100$	mA
$T_{stg}$	Storage temperature	-65	+150	°C

(1) For up to 4 outputs per device: add  $\pm 25$  mA for each additional output.

### 4.2 ESD Ratings

		VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge Human-body model (HBM), per ANSI/ESDA/ JEDEC JS-001 <sup>1</sup>	$\pm 2000$	V

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

### 4.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		MIN	MAX	UNIT
$V_{CC}$	Supply voltage (For $T_A$ = full package-temperature range) AC types ACT types	1.5 4.5	5.5 5.5	V V
$V_I, V_O$	Input or output voltage	0	$V_{CC}$	V
$T_A$	Operating temperature	-55	+125	°C
$dt/dv$	Input rise and fall slew rate at 1.5V to 3V (AC types) at 3.6V to 5.5V (AC types) at 4.5V to 5.5V (ACT types)	0 0 0	50 20 10	ns/V ns/V ns/V

(1) Unless otherwise specified, all voltages are referenced to ground.

### 4.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		CD74AC540, CDx4ACT54x, CDx4AC541		UNIT
		N (PDIP)	DW (SOIC)	
		20 PINS	20 PINS	
$R_{\theta JA}$	Thermal Resistance	69	101.2	°C/W

(1) The package thermal impedance is calculated in accordance with JESD 51.

## 4.5 Electrical Characteristics, AC Series

PARAMETER		TEST CONDITIONS		V <sub>CC</sub> (V)	(T <sub>A</sub> ) - °C						UNIT
					+25		-40 to +85		-55 to +125		
		V <sub>I</sub> (V)	I <sub>O</sub> (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
V <sub>IH</sub>	High-level input voltage			1.5	1.2	—	1.2	—	1.2	—	V
				3	2.1	—	2.1	—	2.1	—	
				5.5	3.85	—	3.85	—	3.85	—	
V <sub>IL</sub>	Low-level input voltage			1.5	—	0.3	—	0.3	—	0.3	V
				3	—	0.9	—	0.9	—	0.9	
				5.5	—	1.65	—	1.65	—	1.65	
V <sub>OH</sub>	High-level output voltage	V <sub>IH</sub> or V <sub>IL</sub> (1), (2)	-0.05	1.5	1.4	—	1.4	—	1.4	—	V
			-0.05	3	2.9	—	2.9	—	2.9	—	
			-0.05	4.5	4.4	—	4.4	—	4.4	—	
			-4	3	2.58	—	2.48	—	2.4	—	
			-24	4.5	3.94	—	3.8	—	3.7	—	
			-75	5.5	—	—	3.85	—	—	—	
			-50	5.5	—	—	—	—	3.85	—	
V <sub>OL</sub>	Low-level output voltage	V <sub>IH</sub> or V <sub>IL</sub> (1), (2)	0.05	1.5	—	0.1	—	0.1	—	0.1	V
			0.05	3	—	0.1	—	0.1	—	0.1	
			0.05	4.5	—	0.1	—	0.1	—	0.1	
			12	3	—	0.36	—	0.44	—	0.5	
			24	4.5	—	0.36	—	0.44	—	0.5	
			75	5.5	—	—	—	1.65	—	—	
			50	5.5	—	—	—	—	—	1.65	
I <sub>I</sub>	Input leakage current	V <sub>CC</sub> or GND		5.5	—	±0.1	—	±1	—	±1	μA
I <sub>OZ</sub>	3-state leakage current	V <sub>IH</sub> or V <sub>IL</sub> V <sub>O</sub> = V <sub>CC</sub> or GND		5.5	—	±0.5	—	±5	—	±10	μA
I <sub>CC</sub>	Quiescent supply current, MSI	V <sub>CC</sub> or GND	0	5.5	—	8	—	80	—	160	μA

- (1) Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
- (2) Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

## 4.6 Electrical Characteristics, ACT Series

PARAMETER		TEST CONDITIONS		V <sub>CC</sub> (V)	(T <sub>A</sub> ) - °C						UNIT
					+25		-40 to +85		-55 to +125		
		V <sub>I</sub> (V)	I <sub>O</sub> (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
V <sub>IH</sub>	High-level input voltage			4.5 to 5.5	2	—	2	—	2	—	V
V <sub>IL</sub>	Low-level input voltage			4.5 to 5.5	—	0.8	—	0.8	—	0.8	V
V <sub>OH</sub>	High-level output voltage	V <sub>IH</sub> or V <sub>IL</sub> (1), (2)	-0.05	4.5	4.4	—	4.4	—	4.4	—	V
			-24	4.5	3.94	—	3.8	—	3.7	—	
			-75	5.5	—	—	3.85	—	—	—	
			-50	5.5	—	—	—	—	3.85	—	
V <sub>OL</sub>	Low-level output voltage	V <sub>IH</sub> or V <sub>IL</sub> (1), (2)	0.05	4.5	—	0.1	—	0.1	—	0.1	V
			24	4.5	—	0.36	—	0.44	—	0.5	
			75	5.5	—	—	—	1.65	—	—	
			50	5.5	—	—	—	—	—	1.65	
I <sub>I</sub>	Input leakage current	V <sub>CC</sub> or GND		5.5	—	±0.1	—	±1	—	±1	μA
I <sub>OZ</sub>	3-state leakage current	V <sub>IH</sub> or V <sub>IL</sub> V <sub>O</sub> = V <sub>CC</sub> or GND		5.5	—	±0.5	—	±5	—	±10	μA
I <sub>CC</sub>	Quiescent supply current, MSI	V <sub>CC</sub> or GND	0	5.5	—	8	—	80	—	160	μA
	Additional quiescent supply current per input pin	V <sub>CC</sub> -2.1		4.5 to 5.5	—	2.4	—	28	—	3	mA
ΔI <sub>CC</sub>	TTL inputs high 1 unit load										

- (1) Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.  
(2) Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

**Table 4-1. Act Input Loading Table**

INPUT	UNIT LOAD <sup>(2)</sup>	
	540	541
DATA	1.42	0.5
OE1, OE2	1.3	1.3



## 4.7 Switching Characteristics, AC Series

$t_r, t_f = 3\text{ns}$ ,  $C_L = 50\text{pF}$  (See [Section 5](#))

PARAMETER			V <sub>CC</sub> (V)	(T <sub>A</sub> ) - °C				UNIT
				-40 to +85		-55 to +125		
				MIN	MAX	MIN	MAX	
Propagation Delays:								
Data to Output								
AC540								
t <sub>PLH</sub>			1.5	—	77	—	85	ns
t <sub>PHL</sub>			3.3*	2.4	8.6	2.4	9.5	
			5†	1.8	6.2	1.7	6.8	
AC541								
t <sub>PLH</sub>			1.5	—	89	—	98	ns
t <sub>PHL</sub>			3.3	2.8	9.9	2.7	10.9	
			5	2.1	7.1	2	7.8	
Enable, to Output to Output								
t <sub>PZL</sub>			1.5	—	136	—	150	ns
t <sub>PZH</sub>			3.3	4.6	16.4	4.5	18	
			5	3.1	10.9	3	12	
Disable to Output to Output								
t <sub>PLZ</sub>			1.5	—	136	—	150	ns
t <sub>PHZ</sub>			3.3	3.9	13.6	3.8	15	
			5	3.1	10.9	3	12	
C <sub>PD</sub> ‡	Power Dissipation Capacitance	AC540	—	60 Typ.		60 Typ.		pF
		AC541	—	60 Typ.		60 Typ.		
V <sub>OHV</sub>	Min. (Valley) V <sub>OH</sub>	During Switching of Other Outputs (Output Under Test Not Switching)	5	4 Typ. @ 25°C				V
V <sub>OLP</sub>	Max. (Peak) V <sub>OL</sub>	During Switching of Other Outputs (Output Under Test Not Switching)	5	1 Typ. @ 25°C				V
C <sub>I</sub>	Input Capacitance		—	—	10	—	10	pF
C <sub>O</sub>	3-State Output Capacitance		—	—	15	—	15	pF

## 4.8 Switching Characteristics, ACT Series

$t_r, t_f = 3\text{ns}$ ,  $C_L = 50\text{pF}$  (See [Section 5](#))

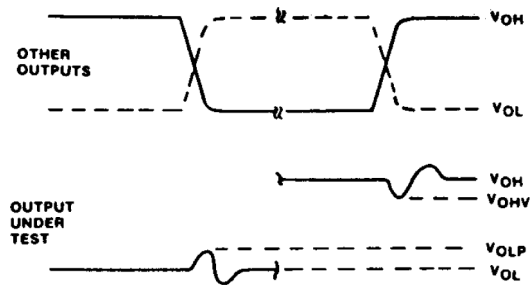
PARAMETER		V <sub>CC</sub> (V)	(T <sub>A</sub> ) - °C				UNIT
			-40 to +85		-55 to +125		
			MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	Propagation Delays: Data to Output: ACT540	5 <sup>(1)</sup>	1.9	6.5	1.8	7.2	ns
t <sub>PHL</sub>	ACT541	5 <sup>(1)</sup>	2.1	7.5	2.1	8.2	ns
t <sub>PZL</sub>	Enable to Output	5	5	3.5	12.2	3.4	ns
t <sub>PZH</sub>							
t <sub>PLZ</sub>	Disable to Output	5	3.5	12.2	3.4	13.4	ns
t <sub>PHZ</sub>							
C <sub>PD</sub> <sup>CPD</sup> is used to determine the dynamic power consumpti on, per channel.	Power Dissipation Capacitance ACT540/ ACT541	—	60 Typ.		60 Typ.		pF
V <sub>OHV</sub>	Min. (Valley) V <sub>OH</sub> During Switching of Other Outputs (Output Under Test Not Switching)	5	4 Typ. @ 25°C				V
V <sub>OLP</sub>	Max. (Peak) V <sub>OL</sub> During Switching of Other Outputs (Output Under Test Not Switching)	5	1 Typ. @ 25°C				V
C <sub>I</sub>	Input Capacitance	—	—	10	—	10	pF
C <sub>O</sub>	3-State Output Capacitance	—	—	15	—	15	pF

(1) 5V: min. is @5.5 V

(2)  $C_{PD}$  is used to determine the dynamic power consumption, per channel.



## 5 Parameter Measurement Information



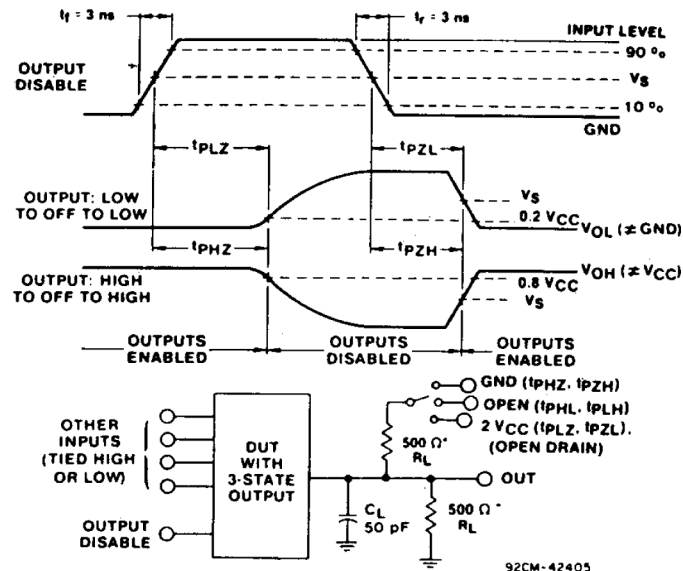
### NOTES:

1.  $V_{OHV}$  AND  $V_{OLP}$  ARE MEASURED WITH RESPECT TO A GROUND REFERENCE NEAR THE OUTPUT UNDER TEST.
2. INPUT PULSES HAVE THE FOLLOWING CHARACTERISTICS:  
 $PRR \leq 1 \text{ MHz}$ ,  $t_r = 3 \text{ ns}$ ,  $t_f = 3 \text{ ns}$ , SKEW 1 ns.
3. R.F. FIXTURE WITH 700-MHz DESIGN RULES REQUIRED. IC SHOULD BE SOLDERED INTO TEST BOARD AND BYPASSED WITH  $0.1 \mu\text{F}$  CAPACITOR. SCOPE AND PROBES REQUIRE 700-MHz BANDWIDTH.

92CS-42406

- A.  $V_{OHV}$  AND  $V_{OLP}$  ARE MEASURED WITH RESPECT TO A GROUND REFERENCE NEAR THE OUTPUT UNDER TEST.
- B. INPUT PULSES HAVE THE FOLLOWING CHARACTERISTICS:  $PRR \leq 1 \text{ MHz}$ ,  $t_r = 3 \text{ ns}$ ,  $t_f = 3 \text{ ns}$ , SKEW 1 ns.
- C. R.F. FIXTURE WITH 700-MHz DESIGN RULES REQUIRED. IC SHOULD BE SOLDERED INTO TEST BOARD AND BYPASSED WITH  $0.1 \mu\text{F}$  CAPACITOR. SCOPE AND PROBES REQUIRE 700-MHz BANDWIDTH.
- D. 92CS-42406

Figure 5-1. Simultaneous Switching Transient Waveforms.



92CM-42405

\*FOR AC SERIES ONLY: WHEN  $V_{CC} = 1.5 \text{ V}$ ,  $R_L = 1 \text{ k}\Omega$

Figure 5-2. Three-state Propagation Delay Waveforms and Test Circuit.

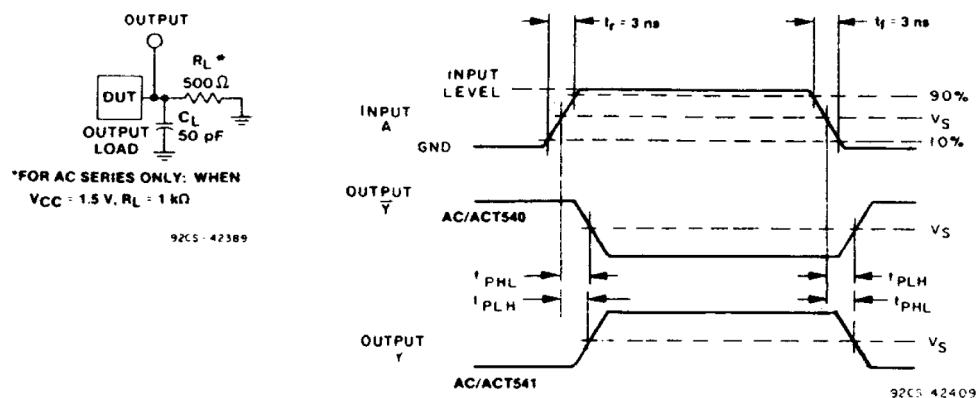


Figure 5-3. Propagation Delay Times and Test Circuit.

	CD54/74AC	CD54/74ACT
Input Level	$V_{CC}$	3 V
input Switching Voltage, $V_S$	0.5 $V_{CC}$	1.5 V
Output Switching Voltage, $V_S$	0.5 $V_{CC}$	0.5 $V_{CC}$

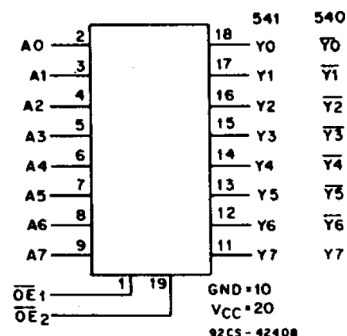
## 6 Detailed Description

### 6.1 Overview

The CD74AC540, -541, and CD74ACT540, -541 are supplied in 20-lead dual-in-line plastic packages (E suffix) and in 20-lead dual-in-line small-outline plastic packages (M suffix). Both package types are operable over the following temperature ranges: Industrial (–40 to +85°C) and Extended Industrial/Military (–55 to +125°C).

The CD54AC540, -541, and CD54ACT540, -541, available in chip form (H suffix), are operable over the –55 to +125°C temperature range.

### 6.2 Functional Block Diagram



### 6.3 Device Functional Modes

Table 6-1. Truth Table

CD54/74AC/ACT540		
INPUTS		OUTPUTS
OE1,OE1	A	Y
L	L	H
L	H	L
H	X	Z

Table 6-2. Truth Table

CD54/74AC/ACT541		
INPUTS		OUTPUTS
OE1,OE2	A	Y
L	L	L
L	H	H
H	X	Z

## 7 Application and Implementation

### Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

### 7.1 Power Supply Recommendations

The power supply can be any voltage between the min and max supply voltage rating located in [Section 4.3](#).

Each  $V_{CC}$  terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, TI recommends 0.1  $\mu\text{F}$  and if there are multiple  $V_{CC}$  terminals, then TI recommends .01  $\mu\text{F}$  or .022  $\mu\text{F}$  for each power terminal. It is okay to parallel multiple bypass capacitors to reject different frequencies of noise. A 0.1  $\mu\text{F}$  and 1  $\mu\text{F}$  are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

### 7.2 Layout

#### 7.2.1 Layout Guidelines

When using multiple bit logic devices inputs should not ever 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 three of the four 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. Specified below are 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 make more sense or is more convenient. Floating outputs is generally acceptable, unless the part is a transceiver. If the transceiver has an output enable pin it will disable the outputs section of the part when asserted. This will not disable the input section of the I.O's so they also cannot float when disabled.

## 8 Device and Documentation Support

### 8.1 Documentation Support (Analog)

#### 8.1.1 Related Documentation

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 8-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
CD74AC540	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD54AC541	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD74AC541	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD54ACT540	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD74ACT540	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD54ACT541	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
CD74ACT541	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>

### 8.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](#). Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

### 8.3 Support Resources

[TI E2E™ support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

### 8.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.  
All trademarks are the property of their respective owners.

### 8.5 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 8.6 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

## 9 Revision History

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

Changes from Revision A (December 1998) to Revision B (May 2024)	Page
• Added <i>Device Information</i> table, <i>Pin Functions</i> table, <i>ESD Ratings</i> table, <i>Thermal Information</i> table, <i>Device Functional Modes</i> , <i>Application and Implementation</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section .....	1
• Updated $\theta_{JA}$ value: DW = 58 to 101.2, all values in °C/W .....	4

## 10 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)
<a href="#">CD54AC541F3A</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54AC541F3A
CD54AC541F3A.A	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54AC541F3A
<a href="#">CD54ACT540F3A</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54ACT540F3A
CD54ACT540F3A.A	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54ACT540F3A
<a href="#">CD54ACT541F3A</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54ACT541F3A
CD54ACT541F3A.A	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54ACT541F3A
<a href="#">CD74AC540M</a>	Obsolete	Production	SOIC (DW)   20	-	-	Call TI	Call TI	-55 to 125	AC540M
<a href="#">CD74AC540M96</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-	AC540M
CD74AC540M96.A	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC540M
<a href="#">CD74AC541E</a>	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74AC541E
CD74AC541E.A	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74AC541E
CD74AC541EE4	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74AC541E
<a href="#">CD74AC541M96</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	(AC541, AC541M)
CD74AC541M96.A	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	(AC541, AC541M)
CD74AC541M96E4	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	(AC541, AC541M)
<a href="#">CD74AC541SM96</a>	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC541SM
CD74AC541SM96.A	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC541SM
<a href="#">CD74ACT540E</a>	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74ACT540E
CD74ACT540E.A	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74ACT540E
<a href="#">CD74ACT540M</a>	Obsolete	Production	SOIC (DW)   20	-	-	Call TI	Call TI	-55 to 125	ACT540M
<a href="#">CD74ACT540M96</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT540M
CD74ACT540M96.A	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT540M
<a href="#">CD74ACT541E</a>	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74ACT541E
CD74ACT541E.A	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74ACT541E
CD74ACT541EE4	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74ACT541E
<a href="#">CD74ACT541M96</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541M
CD74ACT541M96.A	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541M
CD74ACT541M96E4	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541M
CD74ACT541M96G4	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541M

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)
CD74ACT541SM96	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541SM
CD74ACT541SM96.A	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT541SM

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

<sup>(2)</sup> **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.

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

<sup>(4)</sup> **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.

<sup>(5)</sup> **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.

<sup>(6)</sup> **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.

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**OTHER QUALIFIED VERSIONS OF CD54AC541, CD54ACT540, CD54ACT541, CD74AC541, CD74ACT540, CD74ACT541 :**

- Catalog : [CD74AC541](#), [CD74ACT540](#), [CD74ACT541](#)
- Military : [CD54AC541](#), [CD54ACT540](#), [CD54ACT541](#)



NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION



\*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
CD74AC540M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
CD74AC541M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
CD74AC541M96	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
CD74AC541SM96	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
CD74ACT540M96	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
CD74ACT540M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
CD74ACT541M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
CD74ACT541M96	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
CD74ACT541SM96	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74AC540M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74AC541M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74AC541M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74AC541SM96	SSOP	DB	20	2000	353.0	353.0	32.0
CD74ACT540M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74ACT540M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74ACT541M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74ACT541M96	SOIC	DW	20	2000	356.0	356.0	45.0
CD74ACT541SM96	SSOP	DB	20	2000	353.0	353.0	32.0

**TUBE**

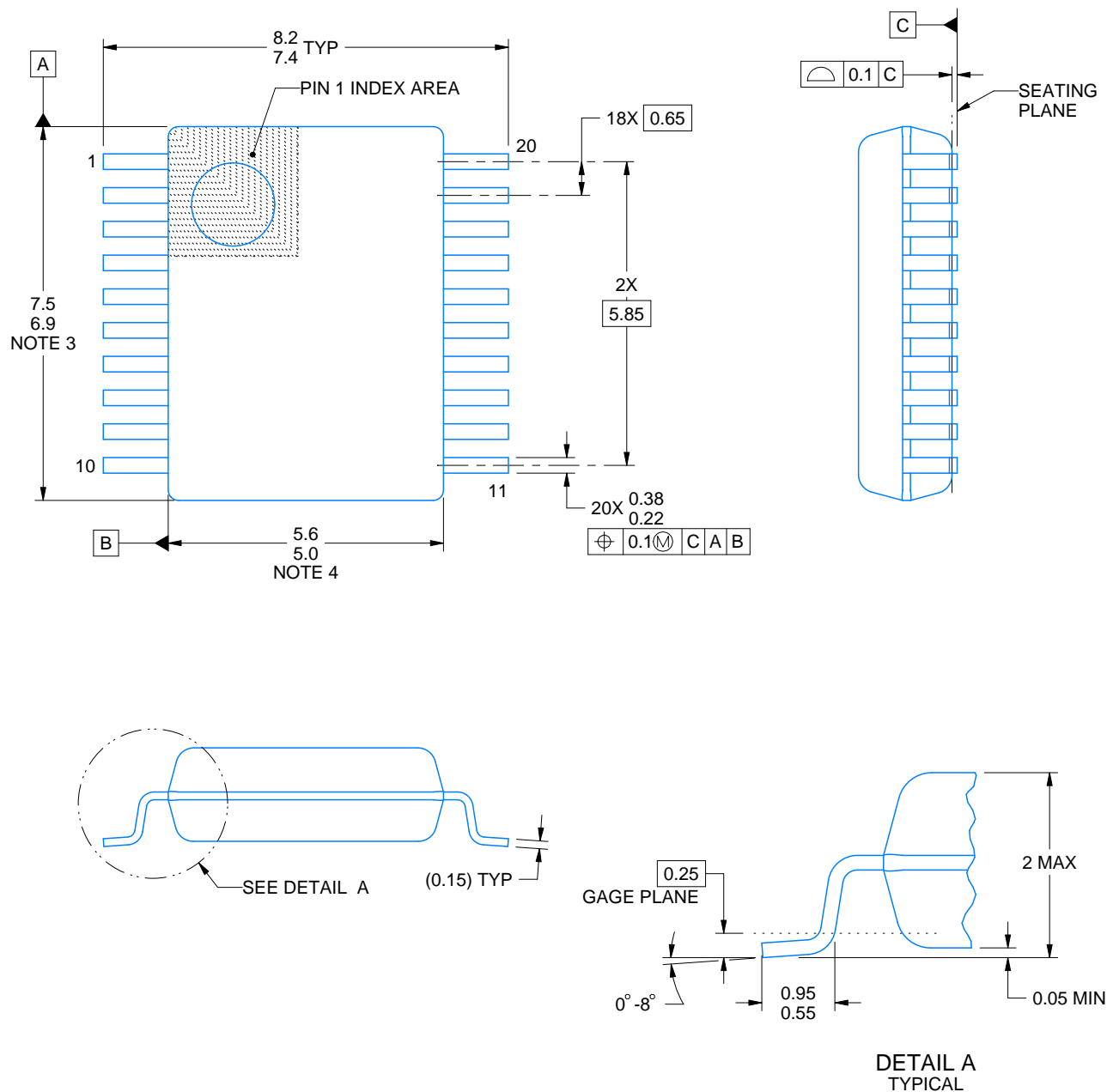

\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
CD74AC541E	N	PDIP	20	20	506	13.97	11230	4.32
CD74AC541E.A	N	PDIP	20	20	506	13.97	11230	4.32
CD74AC541EE4	N	PDIP	20	20	506	13.97	11230	4.32
CD74ACT540E	N	PDIP	20	20	506	13.97	11230	4.32
CD74ACT540E.A	N	PDIP	20	20	506	13.97	11230	4.32
CD74ACT541E	N	PDIP	20	20	506	13.97	11230	4.32
CD74ACT541E.A	N	PDIP	20	20	506	13.97	11230	4.32
CD74ACT541EE4	N	PDIP	20	20	506	13.97	11230	4.32



## 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

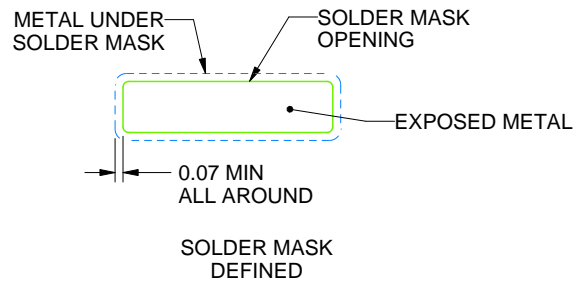
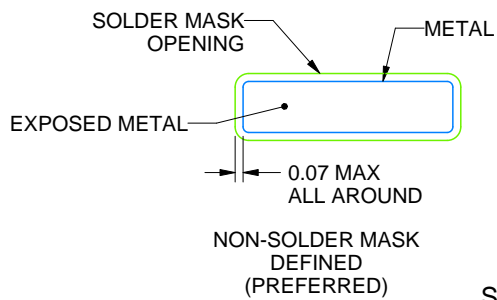
DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



SOLDER MASK DETAILS

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.

J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



PINS ** DIM	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

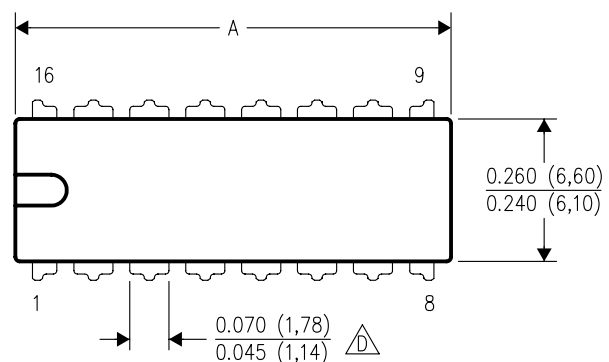
- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit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



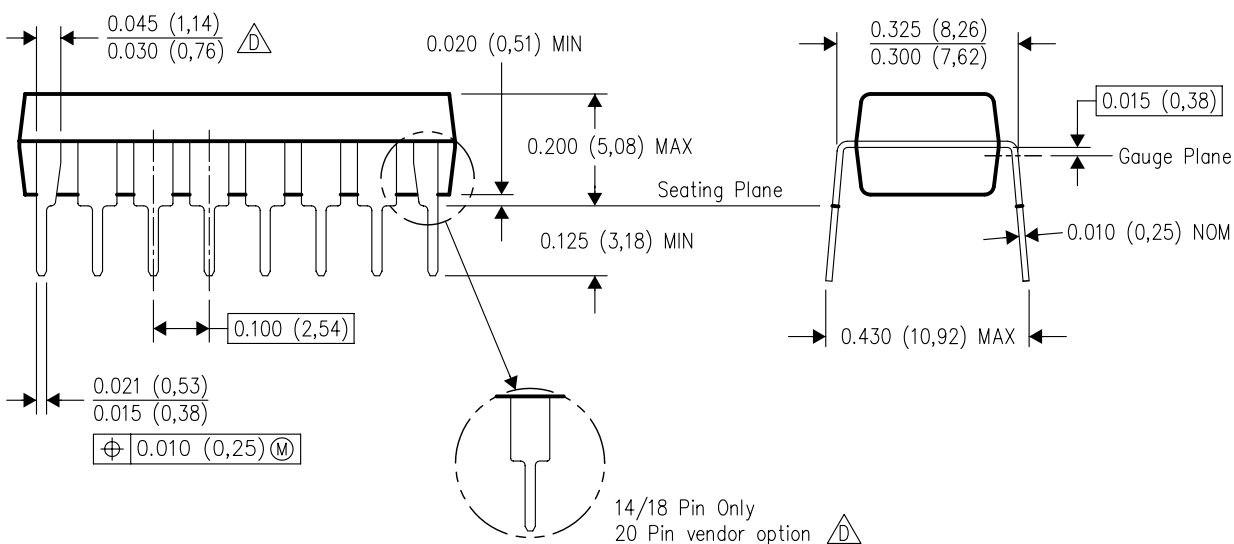
N (R-PDIP-T\*\*)

16 PINS SHOWN



## PLASTIC DUAL-IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



4040049/E 12/2002

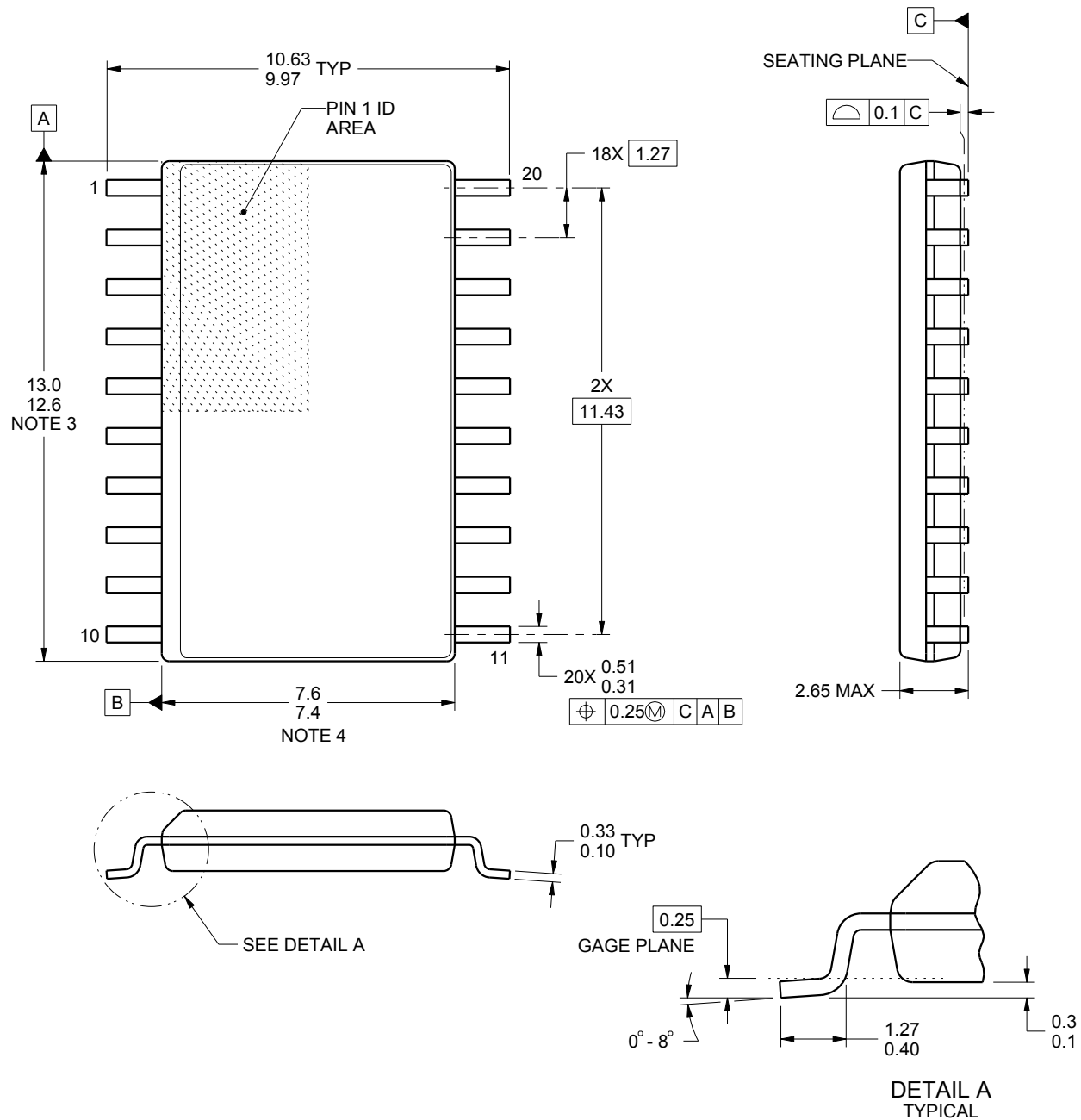
- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  -  Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  -  The 20 pin end lead shoulder width is a vendor option, either half or full width.

**DW0020A**

## PACKAGE OUTLINE

**SOIC - 2.65 mm max height**

SOIC



4220724/A 05/2016

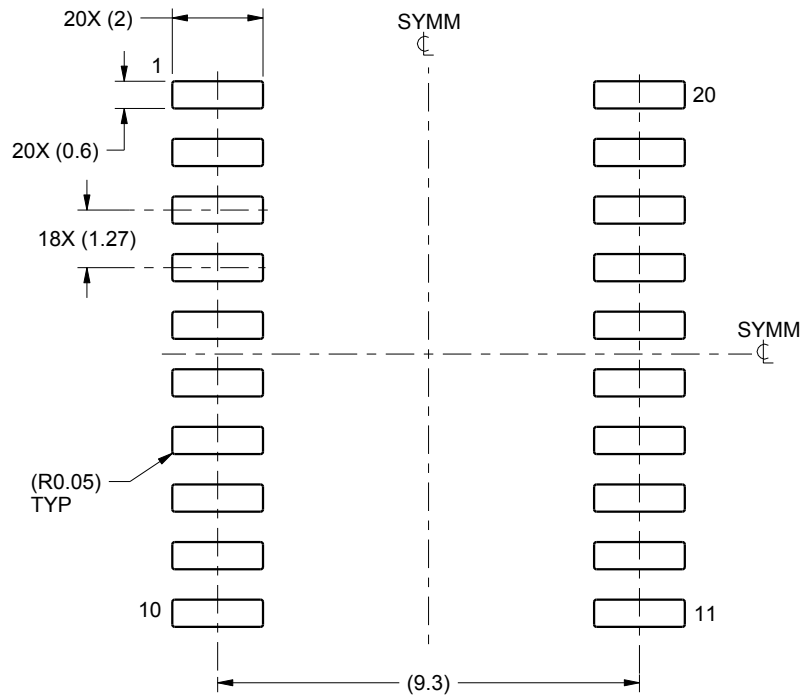
NOTES:

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.

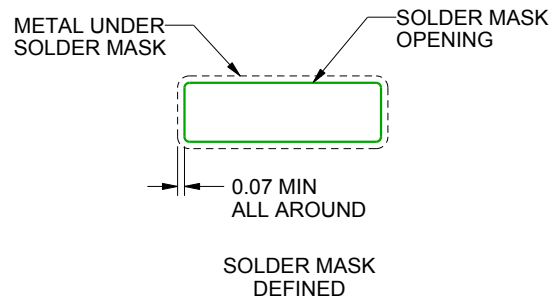
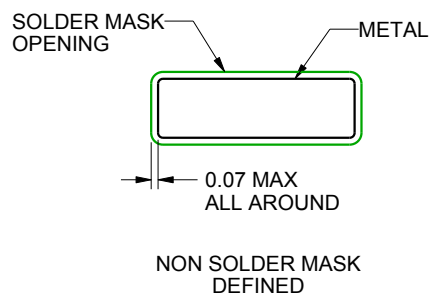
**DW0020A**

**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.

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