
**FUNCTIONAL DIAGRAM**

## Octal D-Type Flip-Flop, 3-State Positive-Edge-Triggered

CD54/74AC/ACT564 - Inverting  
 CD54/74AC/ACT574 - Non-Inverting

**Type Features:**

- Buffered inputs
- Typical propagation delay:  
6.5 ns @  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ ,  $C_L = 50\text{ pF}$

The RCA-CD54/74AC564 and CD54/74AC574 and the CD54/74ACT564 and CD54/74ACT574 octal D-type, 3-state, positive-edge-triggered flip-flops use the RCA ADVANCED CMOS technology. The eight flip-flops enter data into their registers on the LOW-to-HIGH transition of the clock (CP). The Output Enable ( $\overline{OE}$ ) controls the 3-state outputs and is independent of the register operation. When the Output Enable ( $\overline{OE}$ ) is HIGH, the outputs are in the high-impedance state. The CD54/74AC/ACT564 and CD54/74AC/ACT574 share the same pin configurations; the CD54/74AC/ACT564, however, has inverted outputs and the CD54/74AC/ACT574 has non-inverted outputs.

The CD74AC/ACT564 and CD74AC/ACT574 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: Commercial (0 to  $70^\circ\text{C}$ ); Industrial ( $-40$  to  $+85^\circ\text{C}$ ); and Extended Industrial/Military ( $-55$  to  $+125^\circ\text{C}$ ).

The CD54AC/ACT564 and CD54AC/ACT574, available in chip form (H suffix), are operable over the  $-55$  to  $+125^\circ\text{C}$  temperature range.

**Family Features:**

- Exceeds 2-kV ESD Protection - MIL-STD-883, Method 3015
- SCR-Latchup-resistant CMOS process and circuit design
- Speed of bipolar FAST\*/AS/S with significantly reduced power consumption
- Balanced propagation delays
- AC types feature 1.5-V to 5.5-V operation and balanced noise immunity at 30% of the supply
- $\pm 24\text{-mA}$  output drive current
  - Fanout to 15 FAST\* ICs
  - Drives 50-ohm transmission lines

\*FAST is a Registered Trademark of Fairchild Semiconductor Corp.

**TRUTH TABLE**

INPUTS			OUTPUTS	
			564	574
$\overline{OE}$	CP	$D_n$	$\overline{Q_n}$	$Q_n$
L		H	L	H
L		L	H	L
L	L	X	$\overline{QO}$	QO
H	X	X	Z	Z

H = High level (steady state)

L = Low level (steady state)

X = Don't care

= Transition from low to high level

QO = The level of Q before the indicated steady-state input conditions were established

$\overline{QO}$  = The level of  $\overline{Q}$  before the indicated steady-state input conditions were established.

Z = High impedance

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Technical Data

# CD54/74AC564, CD54/74AC574 CD54/74ACT564, CD54/74ACT574

**MAXIMUM RATINGS, Absolute-Maximum Values:**

DC SUPPLY-VOLTAGE ( $V_{CC}$ )	-0.5 to 6 V
DC INPUT DIODE CURRENT, $I_{IK}$ (for $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V)	$\pm 20$ mA
DC OUTPUT DIODE CURRENT, $I_{OK}$ (for $V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V)	$\pm 50$ mA
DC OUTPUT SOURCE OR SINK CURRENT per Output Pin, $I_O$ (for $V_O > -0.5$ V or $V_O < V_{CC} + 0.5$ V)	$\pm 50$ mA
DC $V_{CC}$ or GROUND CURRENT ( $I_{CC}$ or $I_{GND}$ )	$\pm 100$ mA*
POWER DISSIPATION PER PACKAGE ( $P_D$ ):	
For $T_A = -55$ to $+100^\circ\text{C}$ (PACKAGE TYPE E)	500 mW
For $T_A = +100$ to $+125^\circ\text{C}$ (PACKAGE TYPE E)	Derate Linearly at 8 mW/ $^\circ\text{C}$ to 300 mW
For $T_A = -55$ to $+70^\circ\text{C}$ (PACKAGE TYPE M)	400 mW
For $T_A = +70$ to $+125^\circ\text{C}$ (PACKAGE TYPE M)	Derate Linearly at 6 mW/ $^\circ\text{C}$ to 70 mW
OPERATING-TEMPERATURE RANGE ( $T_A$ ):	-55 to $+125^\circ\text{C}$
STORAGE TEMPERATURE ( $T_{stg}$ )	-65 to $+150^\circ\text{C}$
LEAD TEMPERATURE (DURING SOLDERING):	
At distance $1/16 \pm 1/32$ in. ( $1.59 \pm 0.79$ mm) from case for 10 s maximum	$+265^\circ\text{C}$
Unit inserted into PC board min. thickness $1/16$ in. ( $1.59$ mm) with solder contacting lead tips only	$+300^\circ\text{C}$

\*For up to 4 outputs per device; add  $\pm 25$  mA for each additional output.

**RECOMMENDED OPERATING CONDITIONS:**

For maximum reliability, normal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIMITS		UNITS
	MIN.	MAX.	
Supply-Voltage Range, $V_{CC}$ *: (For $T_A =$ Full Package-Temperature Range) AC Types ACT Types	1.5 4.5	5.5 5.5	V V
DC Input or Output Voltage, $V_I, V_O$	0	$V_{CC}$	V
Operating Temperature, $T_A$ :	-55	+125	$^\circ\text{C}$
Input Rise and Fall Slew Rate, $dt/dv$ at 1.5 V to 3 V (AC Types) at 3.6 V to 5.5 V (AC Types) at 4.5 V to 5.5 V (ACT Types)	0 0 0	50 20 10	ns/V ns/V ns/V

\*Unless otherwise specified, all voltages are referenced to ground.

**TERMINAL ASSIGNMENT DIAGRAMS**



CD54/74AC/ACT564



CD54/74AC/ACT574

Technical Data

# CD54/74AC564, CD54/74AC574 CD54/74ACT564, CD54/74ACT574

STATIC ELECTRICAL CHARACTERISTICS: AC Series

CHARACTERISTICS	TEST CONDITIONS		V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>a</sub> ) - °C						UNITS	
				+25		-40 to +85		-55 to +125			
	V <sub>i</sub> (V)	I <sub>o</sub> (mA)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
High-Level Input Voltage V <sub>IH</sub>			1.5	1.2	—	1.2	—	1.2	—	V	
			3	2.1	—	2.1	—	2.1	—		
			5.5	3.85	—	3.85	—	3.85	—		
Low-Level Input Voltage V <sub>IL</sub>			1.5	—	0.3	—	0.3	—	0.3	V	
			3	—	0.9	—	0.9	—	0.9		
			5.5	—	1.65	—	1.65	—	1.65		
High-Level Output Voltage V <sub>OH</sub>	V <sub>IH</sub> or V <sub>IL</sub>	#, *	-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	—	—	—	
Low-Level Output Voltage V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub>	#, *	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	—	—	
Input Leakage Current I <sub>i</sub>	V <sub>CC</sub> or GND		5.5	—	±0.1	—	±1	—	±1	μA	
3-State Leakage Current I <sub>oz</sub>	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	
Quiescent Supply Current, MSI I <sub>CC</sub>	V <sub>CC</sub> or GND	0	5.5	—	8	—	80	—	160	μA	

#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.

\*Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C. 75 ohms at +125°C.

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# CD54/74AC564, CD54/74AC574 CD54/74ACT564, CD54/74ACT574

STATIC ELECTRICAL CHARACTERISTICS: ACT Series

CHARACTERISTICS	TEST CONDITIONS		V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>A</sub> ) - °C						UNITS	
				+25		-40 to +85		-55 to +125			
	V <sub>I</sub> (V)	I <sub>O</sub> (mA)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
High-Level Input Voltage	V <sub>IH</sub>		4.5 to 5.5	2	—	2	—	2	—	V	
Low-Level Input Voltage	V <sub>IL</sub>		4.5 to 5.5	—	0.8	—	0.8	—	0.8	V	
High-Level Output Voltage	V <sub>OH</sub>	V <sub>IH</sub> or V <sub>IL</sub> , #, *	-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	—	
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub> , #, *	0.05	4.5	—	±0.1	—	±1	—	±1	V
			24	4.5	—	0.36	—	0.44	—	0.5	
			75	5.5	—	—	—	1.65	—	—	
			50	5.5	—	—	—	—	—	1.65	
Input Leakage Current	I <sub>I</sub>	V <sub>CC</sub> or GND	5.5	—	±0.1	—	±1	—	±1	μA	
3-State Leakage Current	I <sub>OZ</sub>	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	
Quiescent Supply Current, MSI	I <sub>CC</sub>	V <sub>CC</sub> or GND	0	5.5	—	8	—	80	—	160	μA
Additional Quiescent Supply Current per Input Pin TTL Inputs High 1 Unit Load	ΔI <sub>CC</sub>	V <sub>CC</sub> -2.1	4.5 to 5.5	—	2.4	—	2.8	—	3	mA	

#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.

\*Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

ACT INPUT LOADING TABLE

INPUT	UNIT LOADS*
D, OE	0.7
CP	1.17

\*Unit load is ΔI<sub>CC</sub> limit specified in Static Characteristics Chart, e.g., 2.4 mA max. @ 25°C.

# CD54/74AC564, CD54/74AC574 CD54/74ACT564, CD54/74ACT574

PREREQUISITE FOR SWITCHING: AC Series

CHARACTERISTICS	SYMBOL	V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>A</sub> ) -°C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Clock Pulse Width	t <sub>w</sub>	1.5	44	—	50	—	ns
		3.3*	4.9	—	5.6	—	
		5†	3.5	—	4	—	
Setup Time Data to Clock	t <sub>su</sub>	1.5	2	—	2	—	ns
		3.3	2	—	2	—	
		5	2	—	2	—	
Hold Time Data to Clock	t <sub>h</sub>	1.5	2	—	2	—	ns
		3.3	2	—	2	—	
		5	2	—	2	—	
Maximum Clock Frequency	f <sub>MAX</sub>	1.5	11	—	10	—	MHz
		3.3	101	—	89	—	
		5	143	—	125	—	

\*3.3 V: min. is @ 3 V

†5 V: min. is @ 4.5 V

SWITCHING CHARACTERISTICS: AC Series; t<sub>r</sub>, t<sub>f</sub> = 3 ns, C<sub>L</sub> = 50 pF

CHARACTERISTICS	SYMBOL	V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>A</sub> ) -°C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Propagation Delays: Clock to Q AC574	t <sub>PLH</sub> t <sub>PHL</sub>	1.5	—	123	—	135	ns
		3.3*	4	13.7	3.8	15.1	
		5†	2.9	9.8	2.7	10.8	
Clock to $\bar{Q}$ AC564	t <sub>PLH</sub> t <sub>PHL</sub>	1.5	—	128	—	141	ns
		3.3	4.1	14.4	4	15.8	
		5	2.9	10.3	2.8	11.3	
Output Enable to Q, $\bar{Q}$	t <sub>PZL</sub> t <sub>PZH</sub>	1.5	—	165	—	181	ns
		3.3	5.6	19.2	5.5	21.8	
		5	3.7	13.2	3.6	14.5	
Output Disable to Q, $\bar{Q}$	t <sub>PLZ</sub> t <sub>PHZ</sub>	1.5	—	165	—	181	ns
		3.3	4.7	16.5	4.5	18.1	
		5	3.7	13.2	3.6	14.5	
Power Dissipation Capacitance	C <sub>PD</sub> §	—	67 Typ.		67 Typ.		pF
Min. (Valley) V <sub>OH</sub> During Switching of Other Outputs (Output Under Test Not Switching)	V <sub>OHV</sub> See Fig. 1	5	4 Typ. @ 25°C				V
Max. (Peak) V <sub>OL</sub> During Switching of Other Outputs (Output Under Test Not Switching)	V <sub>OLP</sub> See Fig. 1	5	1 Typ. @ 25°C				V
Input Capacitance	C <sub>I</sub>	—	—	10	—	10	pF
3-State Output Capacitance	C <sub>O</sub>	—	—	15	—	15	pF

\*3.3 V: min. is @ 3.6 V  
max. is @ 3 V

†5 V: min. is @ 5.5 V  
max. is @ 4.5 V

§C<sub>PD</sub> is used to determine the dynamic power consumption, per flip flop.

P<sub>D</sub> = C<sub>PD</sub> V<sub>CC</sub><sup>2</sup> f<sub>i</sub> + Σ V<sub>CC</sub><sup>2</sup> f<sub>o</sub> C<sub>L</sub> where f<sub>i</sub> = input frequency

f<sub>o</sub> = output frequency

C<sub>L</sub> = output load capacitance

V<sub>CC</sub> = supply voltage.

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Technical Data

**CD54/74AC564, CD54/74AC574**  
**CD54/74ACT564, CD54/74ACT574**

PREREQUISITE FOR SWITCHING: ACT Series

CHARACTERISTICS	SYMBOL	V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>A</sub> ) -°C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Clock Pulse Width	t <sub>w</sub>	5†	3.9	—	4.5	—	ns
Setup Time Data to Clock	t <sub>su</sub>	5	2	—	2	—	ns
Hold Time Data to Clock	t <sub>h</sub>	5	2.6	—	3	—	ns
Maximum Clock Frequency	f <sub>MAX</sub>	5	125	—	110	—	MHz

†5 V: min. is @ 4.5 V

SWITCHING CHARACTERISTICS: ACT Series; t<sub>r</sub>, t<sub>f</sub> = 3 ns, C<sub>L</sub> = 50 pF

CHARACTERISTICS	SYMBOL	V <sub>CC</sub> (V)	AMBIENT TEMPERATURE (T <sub>A</sub> ) -°C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Propagation Delays: Clock to Q ACT574	t <sub>PLH</sub> t <sub>PHL</sub>	5†	2.9	10.2	2.8	11.2	ns
Clock to $\bar{Q}$ ACT564	t <sub>PLH</sub> t <sub>PHL</sub>	5	3	10.6	2.9	11.7	ns
Output Enable and Disable to Q ACT574	t <sub>PLZ</sub> t <sub>PHZ</sub> t <sub>PZL</sub> t <sub>PZH</sub>	5	3.7	13.2	3.6	14.5	ns
Output Enable and Disable to $\bar{Q}$ ACT564	t <sub>PLZ</sub> t <sub>PHZ</sub> t <sub>PZL</sub> t <sub>PZH</sub>	5	3.7	13.2	3.6	14.5	ns
Power Dissipation Capacitance	C <sub>PD</sub> §	—	67 Typ.		67 Typ.		pF
Min. (Valley) V <sub>OH</sub> During Switching of Other Outputs (Output Under Test Not Switching)	V <sub>OHV</sub> See Fig. 1	5	4 Typ. @ 25°C				V
Max. (Peak) V <sub>OL</sub> During Switching of Other Outputs (Output Under Test Not Switching)	V <sub>OLP</sub> See Fig. 1	5	1 Typ. @ 25°C				V
Input Capacitance	C <sub>I</sub>	—	—	10	—	10	pF
3-State Output Capacitance	C <sub>O</sub>	—	—	15	—	15	pF

†5 V: min. is @ 5.5 V  
 max. is @ 4.5 V

§C<sub>PD</sub> is used to determine the dynamic power consumption, per flip flop.

$$P_D = C_{PD} V_{CC}^2 f_i + \sum V_{CC}^2 f_o C_L + V_{CC} \Delta I_{CC}$$

where f<sub>i</sub> = input frequency  
 f<sub>o</sub> = output frequency  
 C<sub>L</sub> = output load capacitance  
 V<sub>CC</sub> = supply voltage.

# Technical Data

## CD54/74AC564, CD54/74AC574 CD54/74ACT564, CD54/74ACT574

### 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:  
 $PRR \leq 1$  MHz,  $t_r = 3$  ns,  $t_f = 3$  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  $\mu$ F CAPACITOR. SCOPE AND PROBES REQUIRE 700-MHz BANDWIDTH.

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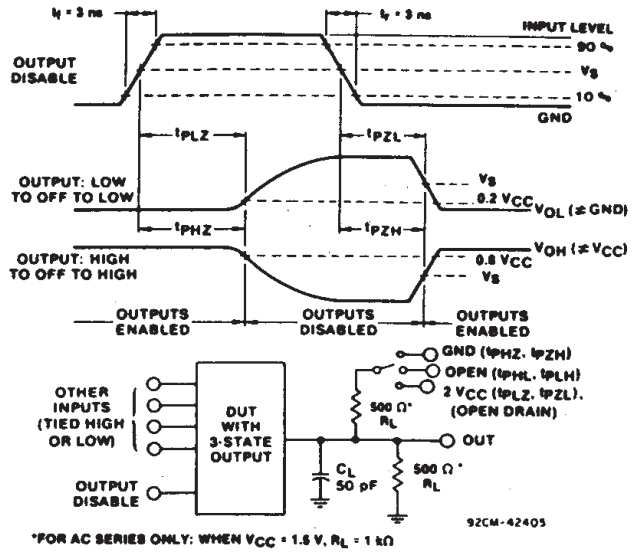
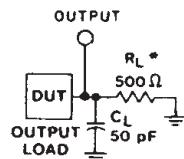
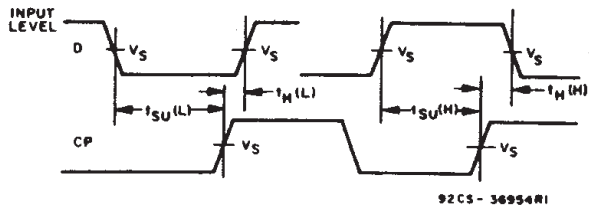
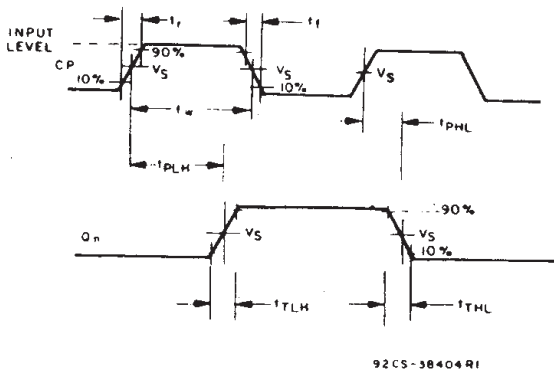


Fig. 1 - Simultaneous switching transient waveforms.

Fig. 2 - Three-state propagation delay waveforms and test circuit.



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

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	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, $V_S$	$0.5 V_{CC}$	$0.5 V_{CC}$

Fig. 3 - Propagation delays times and test circuit.

**PACKAGING INFORMATION**

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
CD54AC574F3A	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	CD54AC574F3A	<a href="#">Samples</a>
CD54ACT574F3A	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	CD54ACT574F3A	<a href="#">Samples</a>
CD74AC574E	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74AC574E	<a href="#">Samples</a>
CD74AC574M	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC574M	<a href="#">Samples</a>
CD74AC574M96	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC574M	<a href="#">Samples</a>
CD74AC574M96G4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC574M	<a href="#">Samples</a>
CD74AC574MG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC574M	<a href="#">Samples</a>
CD74ACT574E	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74ACT574E	<a href="#">Samples</a>
CD74ACT574EE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74ACT574E	<a href="#">Samples</a>
CD74ACT574M	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>
CD74ACT574M96	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>
CD74ACT574M96E4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>
CD74ACT574M96G4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>
CD74ACT574ME4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>
CD74ACT574MG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT574M	<a href="#">Samples</a>

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.



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**OBSELETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

<sup>(3)</sup> MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

<sup>(4)</sup> There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

<sup>(5)</sup> 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.

<sup>(6)</sup> Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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**OTHER QUALIFIED VERSIONS OF CD54AC574, CD54ACT574, CD74AC574, CD74ACT574 :**

● Catalog: [CD74AC574](#), [CD74ACT574](#)

● Military: [CD54AC574](#), [CD54ACT574](#)

NOTE: Qualified Version Definitions:

● Catalog - TI's standard catalog product

- 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
CD74AC574M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
CD74ACT574M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1

TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74AC574M96	SOIC	DW	20	2000	367.0	367.0	45.0
CD74ACT574M96	SOIC	DW	20	2000	367.0	367.0	45.0

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.

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



### 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

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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

DW0020A

SOIC - 2.65 mm max height

SOIC



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

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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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