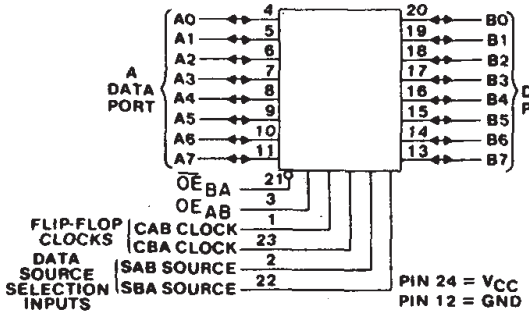
CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

Texas Instruments
Data sheet acquired from Harris Semiconductor
SCHS294



FUNCTIONAL DIAGRAM

Octal-Bus Transceiver/Registers, 3-State

CD54/74AC/ACT651 - Inverting
CD54/74AC/ACT652 - Non-Inverting

Type Features:

- *Buffered inputs*
- *Typical propagation delay:*
  5.3 ns @ V_{CC} = 5 V, T_A = 25°C, C_L = 50 pF

The RCA CD54/74AC651 and CD54/74AC652 and the CD54/74ACT651 and CD54/74ACT652 3-state, octal-bus transceiver/registers use the RCA ADVANCED CMOS technology. The CD54/74AC651 and CD54/74ACT651 have inverting outputs. The CD54/74AC652 and CD54/74ACT652 have non-inverting outputs. These devices consist of bus transceiver circuits, D-type flip-flops, and control circuitry arranged for multiplexed transmission of data directly from the data bus or from the internal storage registers. Output Enables OE_{AB} and $\overline{OE}_{BA}$ are provided to control the transceiver functions. SAB and SBA control pins are provided to select whether real-time or stored data is transferred. The circuitry used for select control will eliminate the typical decoding glitch that occurs in a multiplexer during the transition between stored and real-time data. A LOW input level selects real-time data, and a HIGH selects stored data. The following examples demonstrate the four fundamental bus-management functions that can be performed with the octal-bus transceivers and registers.

Data on the A or B data bus, or both, can be stored in the internal D flip-flops by low-to-high transitions at the appropriate clock pins (CAB or CBA) regardless of the select or enable control pins. When SAB and SBA are in the real-time transfer mode, it is also possible to store data without using the internal D-type flip-flops by simultaneously enabling OE_{AB} and $\overline{OE}_{BA}$. In this configuration, each output reinforces its input. Thus, when all other data sources to the two sets of bus lines are at high impedance, each set of bus lines will remain at its last state.

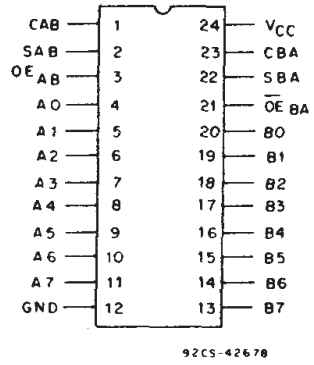
The CD74AC/ACT651 and CD74AC/ACT652 are supplied in 24-lead dual-in-line narrow-body plastic packages (EN suffix) and in 24-lead dual-in-line small-outline plastic packages (M suffix). Both package types are operable over the following temperature ranges: Commercial (0 to 70°C); Industrial (-40 to +85°C); and Extended Industrial/Military (-55 to +125°C).

The CD54AC/ACT651 and CD54AC/ACT652, available in chip form (H suffix), are operable over the -55 to +125°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*
- *± 24-mA output drive current*
  - *Fanout to 15 FAST* ICs*
  - *Drives 50-ohm transmission lines*

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



TERMINAL ASSIGNMENT

This data sheet is applicable to the CD74AC562, CD74ACT651, and CD74ACT652. The CD54/74AC651, CD54AC652, CD54ACT651, and CD54ACT652 were not acquired from Harris Semiconductor.

File Number **1974**

CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

FUNCTION TABLE

INPUTS						DATA I/O		OPERATION OR FUNCTION	
OE_{AB}	$\overline{OE}_{BA}$	CAB	CBA	SAB	SBA	A0 THRU A7	B0 THRU B7	651	652
L	H	H or L	H or L	X	X	Input	Input	Isolation *	Isolation*
L	H	⎍	⎍	X	X			Store A and B Data	Store A and B Data
X	H	⎍	H or L	X	X	Input	Unspecified†	Store A, Hold B	Store A, Hold B
H	H	⎍	⎍	X‡	X	Input	Output	Store A in both registers	Store A in both registers
L	X	H or L	⎍	X	X	Unspecified†	Input	Hold A, Store B	Hold, A Store B
L	L	⎍	⎍	X	X‡	Output	Input	Store B in both registers	Store B in both registers
L	L	X	X	X	L	Output	Input	Real-Time $\overline{B}$ Data to A Bus	Real-Time B Data to A Bus
L	L	X	H or L	X	H			Stored $\overline{B}$ Data to A Bus	Stored B Data to A Bus
H	H	X	X	L	X	Input	Output	Real-Time $\overline{A}$ Data to B Bus	Real-Time A Data to B Bus
H	H	H or L	X	H	X			Stored $\overline{A}$ Data to B Bus	Stored A Data to B Bus
H	L	H or L	H or L	H	H	Output	Output	Stored $\overline{A}$ Data to B Bus and	Stored A Data to B Bus
								Stored $\overline{B}$ Data to A bus	Stored B Data to A Bus

* To prevent excess currents in the High-Z (isolation) modes, all I/O terminals should be terminated with 10kΩ to 1MΩ resistors.

† The data output functions may be enabled or disabled by various signals at the OE_{AB} or OE_{BA} inputs. Data input functions are always enabled, i.e., data at the bus pins will be stored on every low-to-high transition on the clock inputs.

‡ Select control = L: clocks can occur simultaneously.
Select control = H: clocks must be staggered in order to load both registers.

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

*For up to 4 outputs per device; add ± 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:

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

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

CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

STATIC ELECTRICAL CHARACTERISTICS: AC Series

CHARACTERISTICS	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C						UNITS
				+25		-40 to +85		-55 to +125		
	V_I (V)	I_O (mA)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
High-Level Input Voltage V_{IH}			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_{IL}			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_{OH}	V_{IH} or V_{IL}	-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	—	
Low-Level Output Voltage V_{OL}	V_{IH} or V_{IL}	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	
Input Leakage Current I_I	V_{CC} or GND		5.5	—	±0.1	—	±1	—	±1	μA
3-State Leakage Current I_{OZ}	V_{IH} or V_{IL} V_O= V_{CC} or GND		5.5	—	±0.5	—	±5	—	±10	μA
Quiescent Supply Current, MSI I_{CC}	V_{CC} 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.

CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

STATIC ELECTRICAL CHARACTERISTICS: ACT Series

CHARACTERISTICS	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C						UNITS
				+25		-40 to +85		-55 to +125		
	V_I (V)	I_O (mA)		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
High-Level Input Voltage V_{IH}			4.5 to 5.5	2	—	2	—	2	—	V
Low-Level Input Voltage V_{IL}			4.5 to 5.5	—	0.8	—	0.8	—	0.8	V
High-Level Output Voltage V_{OH}	V_{IH} or V_{IL}	-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_{OL}	V_{IH} or V_{IL}	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	
Input Leakage Current I_I	V_{CC} or GND		5.5	—	±0.1	—	±1	—	±1	μA
3-State Leakage Current I_{OZ}	V_{IH} or V_{IL} V_O= V_{CC} or GND		5.5	—	±0.5	—	±5	—	±10	μA
Quiescent Supply Current, MSI I_{CC}	V_{CC} or GND	0	5.5	—	8	—	80	—	160	μA
Additional Quiescent Supply Current per Input Pin TTL Inputs High 1 Unit Load ΔI_{CC}	V_{CC}-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 LOAD*
CAB, CBA	1.25
SAB, SBA	1.2
$\overline{OE}_{AB}$	0.67
$\overline{OE}_{BA}$	1.17
An, Bn	0.4

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 2.4 mA max. @ 25°C.

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CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

PREREQUISITE FOR SWITCHING: AC Series

CHARACTERISTICS	SYMBOL	V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Max. Frequency	f_{max}	1.5	11	—	10	—	MHz
		3.3*	101	—	89	—	
		5†	143	—	125	—	
Setup Time Data to Clock	t_{SU}	1.5	27	—	31	—	ns
		3.3	3.1	—	3.5	—	
		5	2.2	—	2.5	—	
Hold Time Data to Clock	t_H	1.5	2	—	2	—	ns
		3.3	2	—	2	—	
		5	2	—	2	—	
Clock Pulse Data to Clock	t_W	1.5	44	—	50	—	ns
		3.3	4.9	—	5.6	—	
		5	3.5	—	4	—	

*3.3 V: min. is @ 3 V
†5 V; min. is @ 4.5 V

SWITCHING CHARACTERISTICS: AC Series; t_r, t_f = 3 ns, C_L = 50 pF

CHARACTERISTICS	SYMBOL	V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Propagation Delays:							
Store A Data to B Bus	t_{PLH}	1.5	—	154	—	169	ns
Store B Data to A Bus	t_{PHL}	3.3*	4.8	17.1	4.7	18.9	
652		5†	3.5	12.3	3.4	13.5	
Store $\overline{A}$ Data to B Bus	t_{PLH}	1.5	—	154	—	169	ns
Store $\overline{B}$ Data to A Bus	t_{PHL}	3.3	4.8	17.1	4.7	18.9	
651		5	3.5	12.3	3.4	13.5	
A Data to B Bus	t_{PLH}	1.5	—	125	—	138	ns
B Data to A Bus	t_{PHL}	3.3	4	14	3.9	15.4	
652		5	2.8	10	2.8	11	
$\overline{A}$ Data to B Bus	t_{PLH}	1.5	—	125	—	138	ns
$\overline{B}$ Data to A Bus	t_{PHL}	3.3	4	14	3.9	15.4	
651		5	2.8	10	2.8	11	
Select to Data	t_{PLH}	1.5	—	136	—	150	ns
652	t_{PHL}	3.3	4.3	15.3	4.2	16.8	
		5	3.1	10.9	3	12	
Select to Data	t_{PLH}	1.5	—	136	—	150	ns
651	t_{PHL}	3.3	4.3	15.3	4.2	16.8	
		5	3.1	10.9	3	12	
3-State Enabling/ Disabling Time Bus to Output or Register to Output	t_{PZL} t_{PZH} t_{PLZ} t_{PHZ}	1.5	—	154	—	169	ns
		3.3	5.2	18.4	5.1	20.2	
		5	3.5	12.3	3.4	13.5	
Power Dissipation Capacitance	C_{PD}§	—	150 Typ.		150 Typ.		pF
Min. (Valley) V_{OH} During Switching of Other Outputs (Output Under Test Not Switching)	V_{OHV} See Fig. 1	5	4 Typ. @ 25°C				V
Max. (Peak) V_{OL} During Switching of Other Outputs (Output Under Test Not Switching)	V_{OLP} See Fig. 1	5	1 Typ. @ 25°C				V
Input Capacitance	C_I	—	—	10	—	10	pF
3-State Output Capacitance	C_O	—	—	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_{PD} is used to determine the dynamic power consumption, per package.
$P_D = V_{CC}^2 C_{PD} f_i + \Sigma (V_{CC}^2 C_L f_o)$ where f_i = input frequency
f_o = output frequency
C_L = output load capacitance
V_{CC} = supply voltage

CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

PREREQUISITE FOR SWITCHING: ACT Series

CHARACTERISTICS	SYMBOL	V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Max. Frequency	f_{max}	5*	125	—	110	—	MHz
Setup Time Data to Clock	t_{su}	5	2.2	—	2.5	—	ns
Hold Time Data to Clock	t_H	5	2	—	2	—	ns
Clock Pulse Width	t_w	5	3.9	—	4.5	—	ns

*5 V: min. is @ 4.5 V

SWITCHING CHARACTERISTICS: ACT Series; t_r, t_f = 3 ns, C_L = 50 pF

CHARACTERISTICS	SYMBOL	V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C				UNITS
			-40 to +85		-55 to +125		
			MIN.	MAX.	MIN.	MAX.	
Propagation Delays: Store A Data to B Bus, Store B Data to A Bus — 652	t_{PLH} t_{PHL}	5*	4	14.1	3.9	15.5	ns
Store $\overline{A}$ Data to B Bus, Store $\overline{B}$ Data to A Bus — 651	t_{PLH} t_{PHL}	5	4	14.1	3.9	15.5	ns
A Data to B Bus, B Data to A Bus — 652	t_{PLH} t_{PHL}	5	3.2	11.4	3.1	12.5	ns
$\overline{A}$ Data to B Bus, $\overline{B}$ Data to A Bus — 651	t_{PLH} t_{PHL}	5	3.2	11.4	3.1	12.5	ns
Select to Data — 652	t_{PLH} t_{PHL}	5	3.7	13.2	3.6	14.5	ns
Select to Data — 651	t_{PLH} t_{PHL}	5	4	14.1	3.9	15.5	ns
3-State Enabling/ Disabling Time Bus to Output or Register to Output	t_{PZL} t_{PZH} t_{PLZ} t_{PHZ}	5	4	14.1	3.9	15.5	ns
Power Dissipation Capacitance	C_{PD}§	—	150 Typ.		150 Typ.		pF
Min. (Valley) V_{OH} During Switching of Other Outputs (Output Under Test Not Switching)	V_{OHV} See Fig. 1	5	4 Typ. @ 25°C				V
Max. (Peak) V_{OL} During Switching of Other Outputs (Output Under Test Not Switching)	V_{OLP} See Fig. 1	5	1 Typ. @ 25°C				V
Input Capacitance	C_I	—	—	10	—	10	pF
3-State Output Capacitance	C_O	—	—	15	—	15	pF

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

§C_{PD} is used to determine the dynamic power consumption, per package.
$P_D = V_{CC}^2 C_{PD} f_i + \Sigma V_{CC}^2 C_L f_o + V_{CC} \Delta I_{CC}$ where f_i = input frequency
f_o = output frequency
C_L = output load capacitance
V_{CC} = supply voltage.

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CD54/74AC651, CD54/74AC652
CD54/74ACT651, CD54/74ACT652

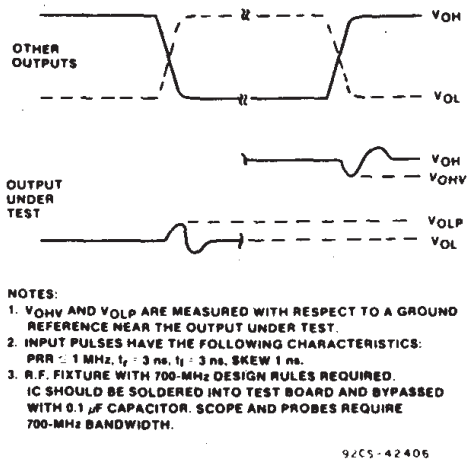


Fig. 1 - Simultaneous switching transient waveforms.

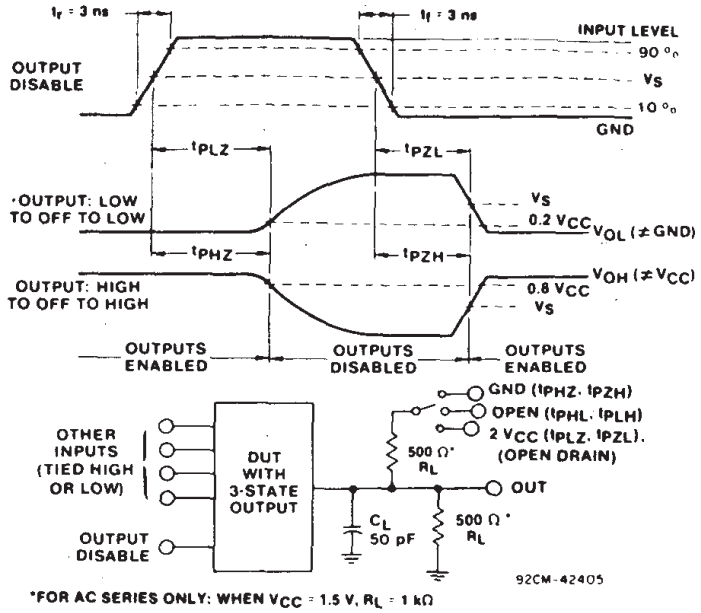


Fig. 2 - Three-state propagation delay waveforms and test circuit.

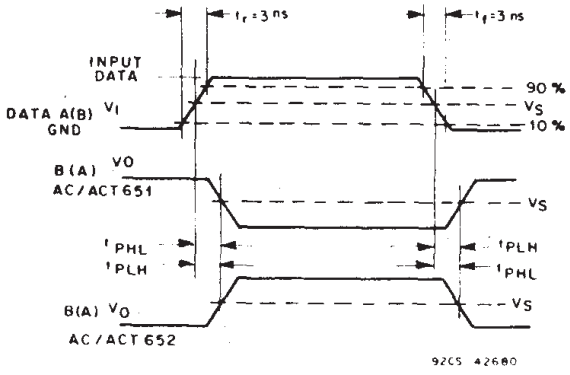


Fig. 3 - Propagation delay times.

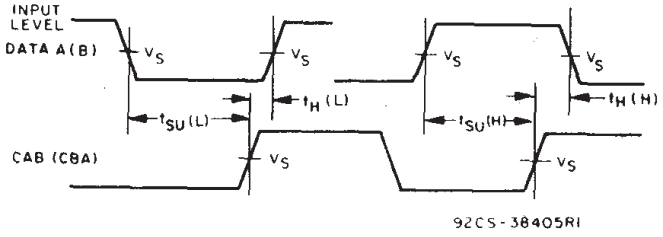


Fig. 4 - Data setup and hold times.

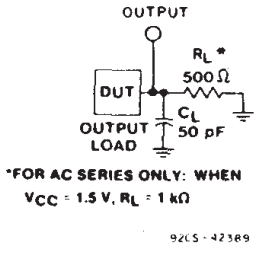


Fig. 5 - Test circuit.

	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}

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
CD74AC652M	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC652M96	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC652M96E4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC652M96G4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC652ME4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC652MG4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT652EN	ACTIVE	PDIP	NT	24	15	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74ACT652ENE4	ACTIVE	PDIP	NT	24	15	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74ACT652M	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT652M96	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT652M96G4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT652MG4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

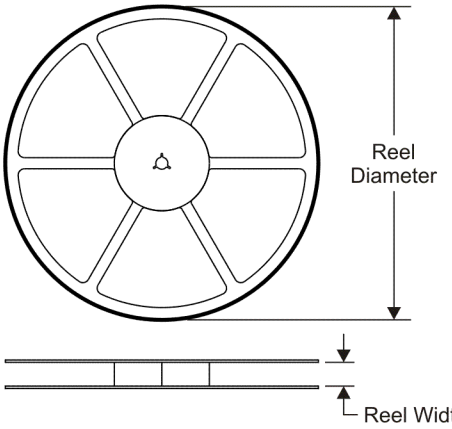
(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

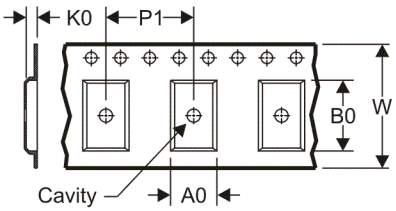
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

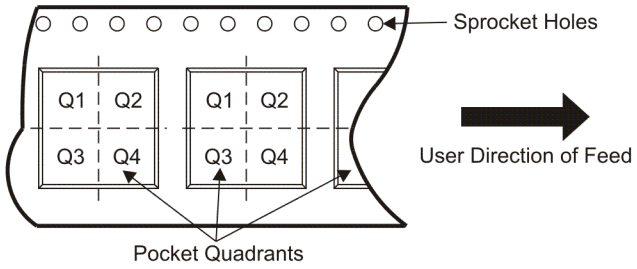


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

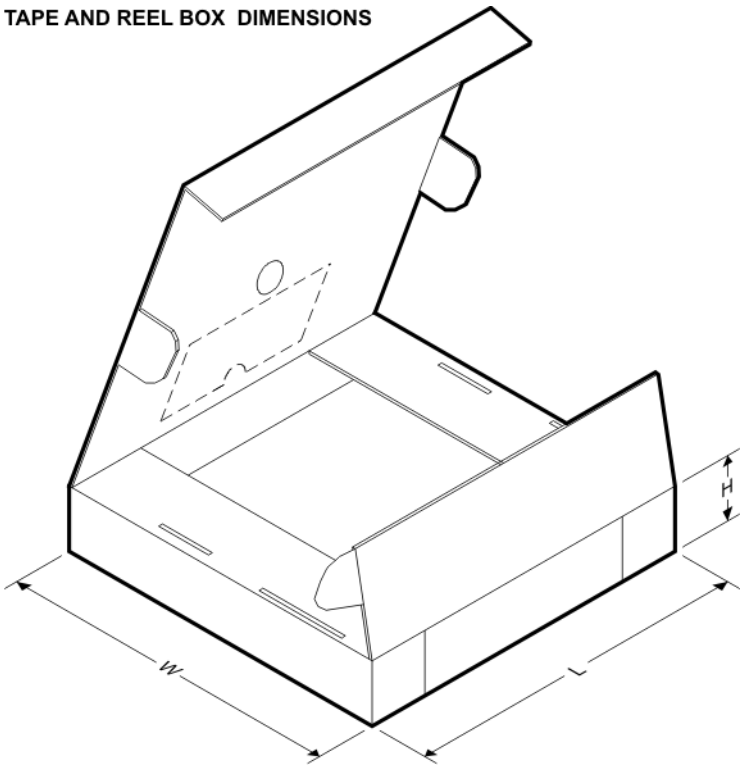
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD74AC652M96	SOIC	DW	24	2000	330.0	24.4	10.75	15.7	2.7	12.0	24.0	Q1
CD74ACT652M96	SOIC	DW	24	2000	330.0	24.4	10.75	15.7	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)
CD74AC652M96	SOIC	DW	24	2000	346.0	346.0	41.0
CD74ACT652M96	SOIC	DW	24	2000	346.0	346.0	41.0

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