CD54AC157...F PACKAGE CD74AC157...E OR M PACKAGE

(TOP VIEW)

1A [] 2 1B [] 3

4

5

8

Ā/B

1Υ **Π**

2A 🛛

2B 🛛 6

2Y [] 7

GND [

16 V_{CC}

15 G

14**1** 4A

13 4B

12 4Y

11 3A

10 3B

9 3Y

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- AC Types Feature 1.5-V to 5.5-V Operation and Balanced Noise Immunity at 30% of the Supply Voltage
- Speed of Bipolar F, AS, and S, With Significantly Reduced Power Consumption
- Balanced Propagation Delays
- ±24-mA Output Drive Current
 Fanout to 15 F Devices
- SCR-Latchup-Resistant CMOS Process and Circuit Design
- Exceeds 2-kV ESD Protection Per MIL-STD-883, Method 3015

descri	otion/or	derina	information
acoun		acing	mormation

These quadruple 2-line to 1-line data selectors/multiplexers are designed for 1.5-V to 5.5-V V_{CC} operation.

The 'AC157 devices feature a common strobe (\overline{G}) input. When the strobe is high, all outputs are low. When the strobe is low, a 4-bit word is selected from one of two sources and is routed to the four outputs. The devices provide true data.

ORDERING INFORMATION

TA	PACKA	ORDERABLE PART NUMBER	TOP-SIDE MARKING		
	PDIP – E	Tube	CD74AC157E	CD74AC157E	
–55°C to 125°C	SOIC – M	Tube	CD74AC157M	AC157M	
-55 C 10 125 C	301C - M	Tape and reel	CD74AC157M96	ACTOTIM	
	CDIP – F	Tube	CD54AC157F3A	CD54AC157F3A	

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

	INPU	JTS		OUTPUT
G	Ā/B	Α	В	Y
н	Х	Х	Х	L
L	L	L	х	L
L	L	Н	х	н
L	Н	Х	L	L
L	н	Х	н	н

FUNCTION TABLE



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

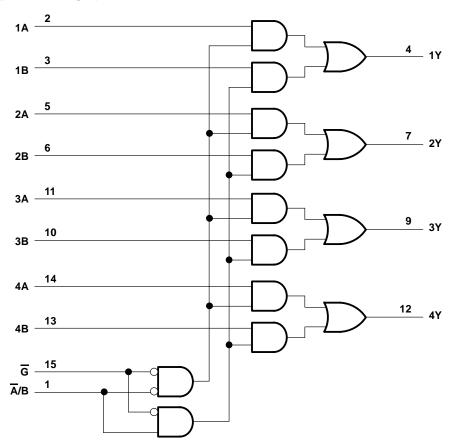
PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage range, V _{CC}	–0.5 V to 6 V
Input clamp current, I_{IK} ($V_I < 0$ V or $V_I > V_{CC}$) (see Note 1)	±20 mA
Output clamp current, I _{OK} (V _O < 0 V or V _O > V _{CC}) (see Note 1)	±50 mA
Continuous output current, I _O (V _O > 0 V or V _O < V _{CC})	±50 mA
Continuous current through V _{CC} or GND	±100 mA
Package thermal impedance, θ_{JA} (see Note 2): E package	67°C/W
M package	73°C/W
Storage temperature range, T _{stg}	–65°C to 150°C

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. The package thermal impedance is calculated in accordance with JESD 51-7.



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recommended operating conditions (see Note 3)

			T _A = 25°C		–55°C to 125°C		–40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
VCC	Supply voltage		1.5	5.5	1.5	5.5	1.5	5.5	V
		V _{CC} = 1.5 V	1.2		1.2		1.2		
VIH High-lev	High-level input voltage	$V_{CC} = 3 V$	2.1		2.1		2.1		V
		V _{CC} = 5.5 V	3.85		3.85		3.85		
	Low-level input voltage	V _{CC} = 1.5 V		0.3		0.3		0.3	
VIL		V _{CC} = 3 V		0.9		0.9		0.9	V
		V _{CC} = 5.5 V		1.65		1.65		1.65	
VI	Input voltage		0	VCC	0	VCC	0	VCC	V
VO	Output voltage		0	VCC	0	VCC	0	VCC	V
IОН	High-level output current	V _{CC} = 4.5 V to 5.5 V		-24		-24		-24	mA
IOL	Low-level output current	V _{CC} = 4.5 V to 5.5 V		24		24		24	mA
A+/A.	Input transition rise or fall rate	V_{CC} = 1.5 V to 3 V		50		50		50	n o//
$\Delta t / \Delta v$	Input transition rise or fall rate	V _{CC} = 3.6 V to 5.5 V		20		20		20	ns/V

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

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

PARAMETER	TEST CON	vcc	T _A = 25°C		–55°C to 125°C		–40°C to 85°C		
				MIN MA	X MIN	MAX	MIN	MAX	
			1.5 V	1.4	1.4		1.4		
		I _{OH} = -50 μA	3 V	2.9	2.9		2.9		
			4.5 V	4.4	4.4		4.4		
VOH	$V_I = V_{IH} \text{ or } V_{IL}$	I _{OH} =4 mA	3 V	2.58	2.4		2.48		V
		I _{OH} = -24 mA	4.5 V	3.94	3.7		3.8		
		I _{OH} = -50 mA [†]	5.5 V		3.85				
		I _{OH} = -75 mA†	5.5 V				3.85		
			1.5 V	0	1	0.1		0.1	
		I _{OL} = 50 μA	3 V	0	1	0.1		0.1	
			4.5 V	0	1	0.1		0.1	
VOL	$V_I = V_{IH} \text{ or } V_{IL}$	I _{OL} = 12 mA	3 V	0.3	6	0.5		0.44	V
		I _{OL} = 24 mA	4.5 V	0.3	6	0.5		0.44	
		I _{OL} = 50 mA [†]	5.5 V			1.65			
		I _{OL} = 75 mA [†]	5.5 V					1.65	
lj	$V_I = V_{CC}$ or GND		5.5 V	±0.	1	±1		±1	μA
ICC	$V_I = V_{CC}$ or GND,	IO = 0	5.5 V		8	160		80	μA
Ci				1	0	10		10	pF

† Test one output at a time, not exceeding 1-second duration. Measurement is made by forcing indicated current and measuring voltage to minimize power dissipation. Test verifies a minimum 50-Ω transmission-line drive capability at 85°C and 75-Ω transmission-line drive capability at 125°C.



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switching characteristics over recommended operating free-air temperature range, $V_{CC} = 1.5 \text{ V}$, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	–55°C 125°		–40°(85°	UNIT		
	(111 01)	(001F01)	MIN	MAX	MIN	MAX		
^t PLH	A or B	Any X		106		97	20	
^t PHL	AUB	Any Y		106		97	ns	
^t PLH	Ā/B	Any Y		180		164	20	
^t PHL	А/В	Ally I		180		164	ns	
^t PLH	IJ	Any Y		169		154	-	
^t PHL	9			169		154	ns	

switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V \pm 0.3 V, C_L = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	–55° 125		–40°(85°		UNIT
			MIN	MAX	MIN	MAX	
^t PLH	A or B	Any V	3	11.9	3.2	10.8	ns
^t PHL	AOIB	Any Y	3	11.9	3.2	10.8	115
^t PLH	Ā/B	Any Y	5.1	20.3	5.4	18.5	ns
^t PHL	A/B		5.1	20.3	5.4	18.5	115
^t PLH	G	Any Y	4.7	18.9	5.1	17.2	ns
^t PHL	0		4.7	18.9	5.1	17.2	115

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V \pm 0.5 V, C_L = 50 pF (unless otherwise noted) (see Figure 1)

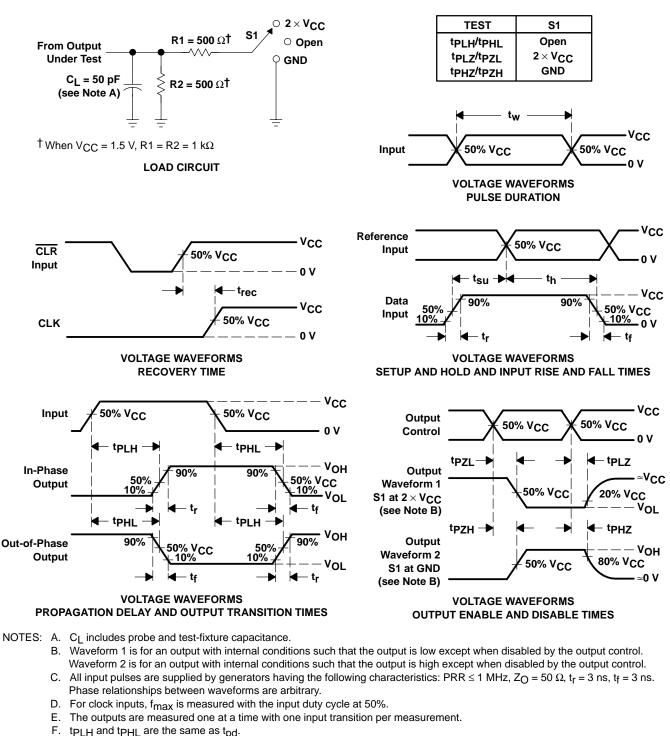
PARAMETER	FROM (INPUT)	ТО (О U ТРUТ)	–55° 125		–40°(85°	UNIT	
		(001F01)	MIN	MAX	MIN	MAX	
^t PLH	A or B		2.1	8.5	2.2	7.7	20
^t PHL	AUB	Any Y	2.1	8.5	2.2	7.7	ns
^t PLH	Ā/B		3.6	14.5	3.8	13.2	20
^t PHL	A/B	Any Y	3.6	14.5	3.8	13.2	ns
^t PLH	G	Any Y	3.4	13.5	3.6	12.3	200
^t PHL	0		3.4	13.5	3.6	12.3	ns

operating characteristics, V_{CC} = 5 V, T_A = 25°C

	PARAMETER	TYP	UNIT
C _{pd}	Power dissipation capacitance	156	pF



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PARAMETER MEASUREMENT INFORMATION

- G. tp71 and tp7H are the same as ten.
- H. tpLz and tpHz are the same as tdis.
- I. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms





11-Apr-2013

PACKAGING INFORMATION

Orderable Device	Status	Package Type	Package Drawing		Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
CD54AC157F3A	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	CD54AC157F3A	Samples
CD74AC157E	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74AC157E	Samples
CD74AC157EE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74AC157E	Samples
CD74AC157M	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples
CD74AC157M96	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples
CD74AC157M96E4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples
CD74AC157M96G4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples
CD74AC157ME4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples
CD74AC157MG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC157M	Samples

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

ACTIVE: Product device recommended for new designs.

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

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.



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PACKAGE OPTION ADDENDUM

11-Apr-2013

(4) Multiple Top-Side Markings will be inside parentheses. Only one Top-Side 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 Top-Side Marking for that device.

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OTHER QUALIFIED VERSIONS OF CD54AC157, CD74AC157 :

- Catalog: CD74AC157
- Military: CD54AC157

NOTE: Qualified Version Definitions:

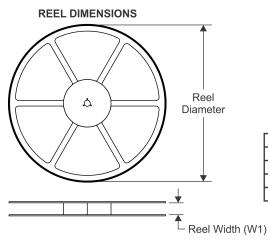
- Catalog TI's standard catalog product
- Military QML certified for Military and Defense Applications

PACKAGE MATERIALS INFORMATION

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TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal												
Device	Package Type	Package Drawing	Pins		Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD74AC157M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1

TEXAS INSTRUMENTS

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PACKAGE MATERIALS INFORMATION

26-Jan-2013



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74AC157M96	SOIC	D	16	2500	333.2	345.9	28.6

J (R-GDIP-T**) 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



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**)

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



D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters).

- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AC.



4211283-4/E 08/12

D (R-PDSO-G16) PLASTIC SMALL OUTLINE Stencil Openings (Note D) Example Board Layout (Note C) –16x0,55 -14x1,27 -14x1,27 16x1,50 5,40 5.40 Example Non Soldermask Defined Pad Example Pad Geometry (See Note C) 0,60 .55 Example 1. Solder Mask Opening (See Note E) -0,07 All Around

NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



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