

Monolithic Digital IC



No.4094

LB1741

Octal NPN Darlington-pair Transistor Array

OVERVIEW

The LB1741 is a high-current Darlington-pair transistor array that incorporates output clamp diodes, making it ideal for driving inductive loads.

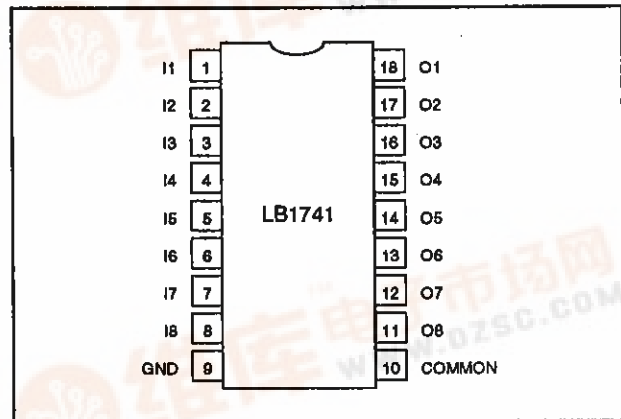
The LB1741 with active-HIGH, 10.5 kΩ impedance inputs interfaces directly to P-MOS or CMOS logic. With an input voltage of -0.5 to 30 V (max), outputs can sink 500 mA (max) per channel and have 50 V (max) output withstand voltages.

The LB1741 is available in 18-pin DIPs.

FEATURES

- Output clamp diodes
- Drives inductive loads
- Active-HIGH, 10.5 kΩ impedance inputs
- Interfaces to P-MOS or CMOS logic
- 500 mA (max) per channel output current sink
- 50 V (max) output withstand voltage
- 30 V (max) input voltage
- 18-pin DIP

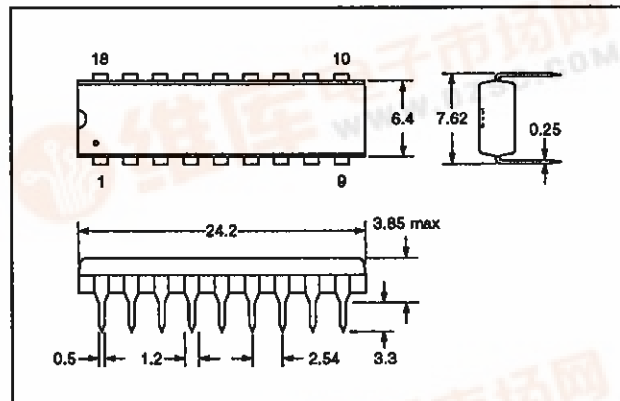
PINOUT



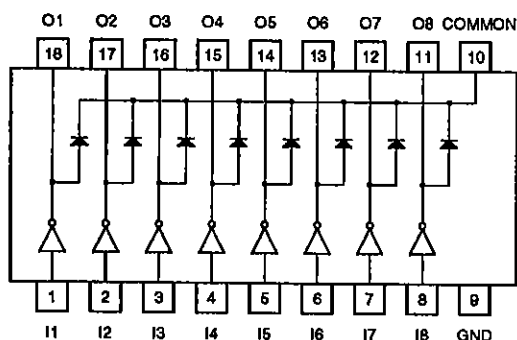
PACKAGE DIMENSIONS

Unit: mm

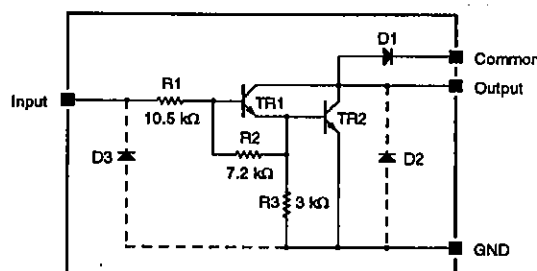
3007A-DIP18



BLOCK DIAGRAM



EQUIVALENT CIRCUIT



Notes

1. Only one channel is shown.
2. D2 and D3 are parasitic diodes.

PIN DESCRIPTION

Number	Name	Description
1 to 8	I1 to I8	Transistor inputs
9	GND	Ground
10	COMMON	Transistor common
11 to 18	O1 to O8	Transistor outputs

SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Output withstand voltage range	V_{CEO}	-0.5 to 50	V
Input voltage range	V_i	-0.5 to 30	V
Output current	I_o	500	mA
GND current	I_{GND}	3.2	A
Clamp diode withstand voltage	V_R	50	V
Clamp diode forward current	I_F	500	mA
Power dissipation	P_D	1.47	W
Operating temperature range	T_{OPR}	-40 to 85	°C
Storage temperature range	T_{stg}	-55 to 150	°C

Recommended Operating Conditions

$T_a = 25\text{ °C}$

Parameter	Symbol	Conditions	Rating			Unit
			min	typ	max	
Output withstand voltage range	V_{CEO}		0	-	50	V
Power dissipation	P_D		-	-	0.52	W
Input voltage	V_i		0	-	30	V
Output current	I_o	25 ms, 8% duty cycle, eight circuits	0	-	400	mA
		25 ms, 25% duty cycle, eight circuits	0	-	200	

LB1741

Parameter	Symbol	Conditions	Rating			Unit
			min	typ	max	
Clamp diode withstand voltage	V_R		-	-	50	V
Clamp diode forward current	I_F		-	-	400	mA

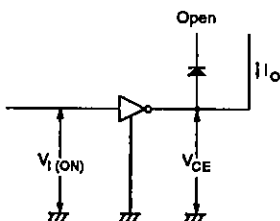
Electrical Characteristics

$T_a = 25\text{ }^\circ\text{C}$

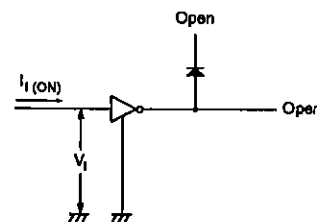
Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Turn-ON input voltage	$V_{I(ON)}$	$V_{CE} = 2\text{ V}, I_O = 125\text{ mA}$	-	-	5.0	V
		$V_{CE} = 2\text{ V}, I_O = 200\text{ mA}$	-	-	6.0	
		$V_{CE} = 2\text{ V}, I_O = 275\text{ mA}$	-	-	7.0	
		$V_{CE} = 2\text{ V}, I_O = 350\text{ mA}$	-	-	8.0	
Transistor ON input current	$I_{I(ON)}$	$V_I = 12\text{ V}$	-	1.0	1.45	mA
Transistor OFF input current	$I_{I(OFF)}$	$I_O = 500\text{ }\mu\text{A}$	-	-	65	μA
DC current gain	h_{FE}	$V_{CE} = 2\text{ V}, I_O = 350\text{ mA}$	1000	-	-	
Output saturation voltage	$V_{CE(sat)}$	$I_I = 500\text{ }\mu\text{A}, I_O = 350\text{ mA}$	-	1.3	1.6	V
		$I_I = 350\text{ }\mu\text{A}, I_O = 200\text{ mA}$	-	1.1	1.3	
		$I_O = 250\text{ }\mu\text{A}, I_O = 100\text{ mA}$	-	0.9	1.1	
Output leakage current	I_{CEX}	$V_{CE} = 50\text{ V}$	-	-	50	μA
		$V_{CE} = 50\text{ V}, V_I = 1\text{ V}$	-	-	500	
Clamp diode leakage current	I_R	$V_R = 50\text{ V}$	-	-	50	μA
Clamp diode forward voltage	V_F	$I_F = 350\text{ mA}$	-	-	2.0	V
Input capacitance	C_I		-	40	-	pF
Turn-ON delay time	t_{ON}	$R_L = 125\text{ }\Omega, C_L = 15\text{ pF}, V_O = 50\text{ V}$	-	0.1	-	μs
Turn-OFF delay time	t_{OFF}	$R_L = 125\text{ }\Omega, C_L = 15\text{ pF}, V_O = 50\text{ V}$	-	0.2	-	μs

Measurement Circuits

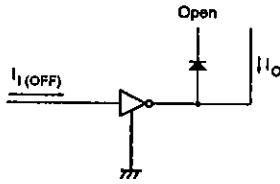
Turn-ON input voltage



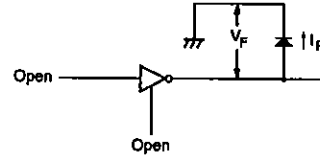
ON-state input current



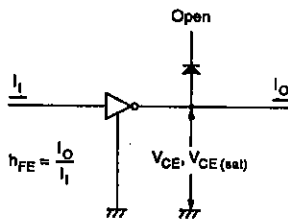
OFF-state input current



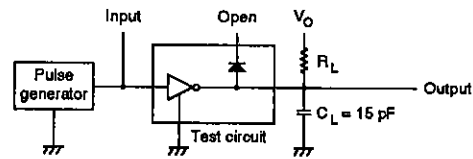
Clamp diode forward voltage



DC current gain and output saturation voltage



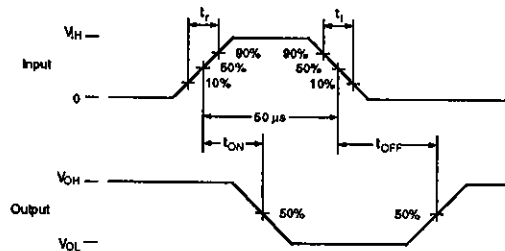
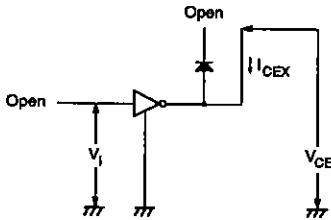
Turn-ON and turn-OFF delay times



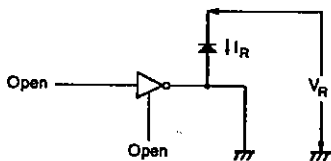
Notes

1. 50 μ s pulsewidth, 10% duty cycle, 50 Ω pulse generator output impedance, $t_r \leq 5$ ns, $t_f \leq 10$ ns, $V_I = 8$ V

Output leakage current



Clamp diode leakage current



2. C_L includes probe and jig capacitances.

■ No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.

■ Anyone purchasing any products described or contained herein for an above-mentioned use shall:

- ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use.
- ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.

■ Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.