



SANYO Semiconductors

## DATA SHEET

# LB1231 Series — Monolithic Digital IC High-Voltage, Large Current Darlington Transistor Array

## Overview

The circuit configuration of this IC is of 7-channel Darlington transistor array consisting of NPN transistors. It is especially suited for use in hammer drivers and lamp, relay drivers. It contains spark killer diodes against L load.

## Features

- High-voltage ( $V_{CEO} \geq 50V$ ), large-current ( $I_C \text{ max} = 500mA$ ) drive
  - LB1231 • Drivable by TTL, MOS output.
  - LB1232 • Contains base current limiting resistors, Zener diodes for level shift.
    - Direct drivable by 24V PMOS.
  - LB1233 • Contains base current limiting resistors.
    - Direct drivable by TTL, CMOS output.
  - LB1234 • Contains base current limiting resistors.
    - Direct drivable by CMOS, PMOS output.

## Specifications

**Absolute Maximum Ratings** at  $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Output supply voltage	$V_{OUT}$		50	V
Output current	$I_{OUT}$	Per unit	500	mA
Input supply voltage	$V_{IN}$	LB1232/33/34	30	V
Input current	$I_{IN}$	LB1231 only	25	mA
GND pin current	$I_{GND}$	7ch simultaneously on, $f = 10Hz$ , duty = 23%	2.8	A
Allowable power dissipation	$P_d \text{ max}$		1.5	W
Operating temperature	$T_{opr}$		-20 to +75	$^\circ C$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ C$

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# LB1231,1232,1233,1234

## Allowable Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Output supply voltage	V <sub>OUT</sub>		50	V
Input "H" level voltage	V <sub>IH</sub>	LB1232 I <sub>OUT</sub> = 350mA	11 to 30	V
		LB1233 I <sub>OUT</sub> = 350mA	3 to 30	V
		LB1234 I <sub>OUT</sub> = 350mA	5 to 30	V
Input "L" level voltage	V <sub>IL</sub>	LB1231/33 I <sub>OUT</sub> ≤ 100μA	-0.3 to +0.3	V
		LB1232 I <sub>OUT</sub> ≤ 100μA	-0.3 to +6.0	V
		LB1234 I <sub>OUT</sub> ≤ 100μA	-0.3 to +0.7	V

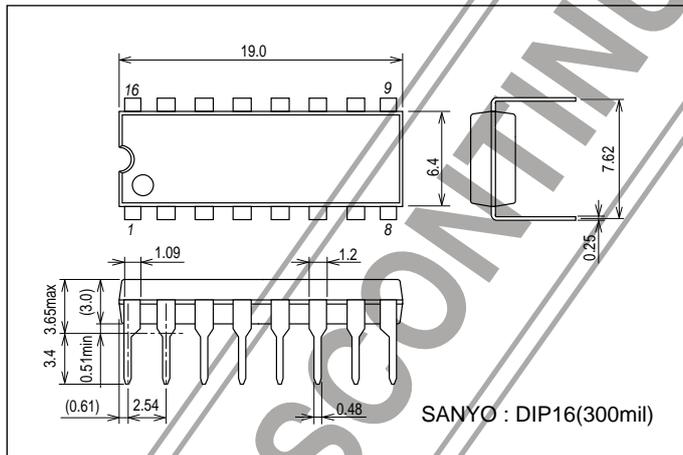
## Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output leakage current	I <sub>OFF</sub>	V <sub>OUT</sub> = 50V			100	μA
Output voltage	V <sub>OH1</sub>	I <sub>IN</sub> = 0.25mA, I <sub>OUT</sub> = 100mA		0.9	1.1	V
	V <sub>OH2</sub>	I <sub>IN</sub> = 0.35mA, I <sub>OUT</sub> = 200mA		1.1	1.3	V
	V <sub>OH3</sub>	I <sub>IN</sub> = 0.5mA, I <sub>OUT</sub> = 350mA		1.3	1.6	V
	V <sub>OH4</sub>	I <sub>IN</sub> = 1mA, I <sub>OUT</sub> = 400mA			2.4	V
Input voltage	V <sub>IN</sub>	LB1231 I <sub>IN</sub> = 1mA		1.35	1.7	V
Input voltage	I <sub>IN</sub>	LB1232 V <sub>IN</sub> = 17V		0.82	1.25	mA
		LB1233 V <sub>IN</sub> = 3.85V		0.93	1.35	mA
		LB1234 V <sub>IN</sub> = 5V		0.35	0.5	mA
		LB1234 V <sub>IN</sub> = 12V		1.00	1.45	mA
Spark killer diode leak current	I <sub>R</sub> (S)	V <sub>R</sub> (S) = 50V			100	μA
Spark killer diode forward voltage	V <sub>F</sub> (S) 1	I <sub>F</sub> (S) = 350mA			2.0	V
	V <sub>F</sub> (S) 2	I <sub>F</sub> (S) = 400mA			2.4	V

## Package Dimensions

unit : mm (typ)

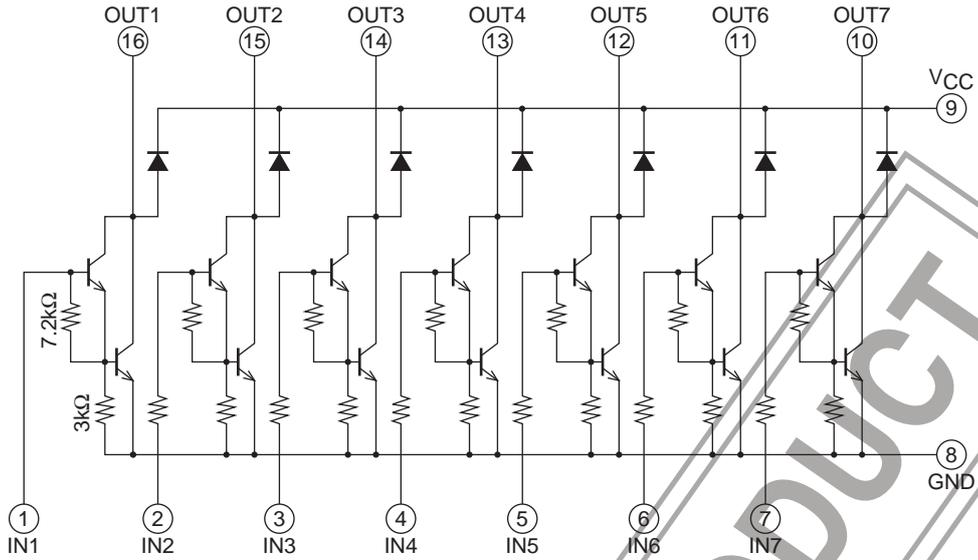
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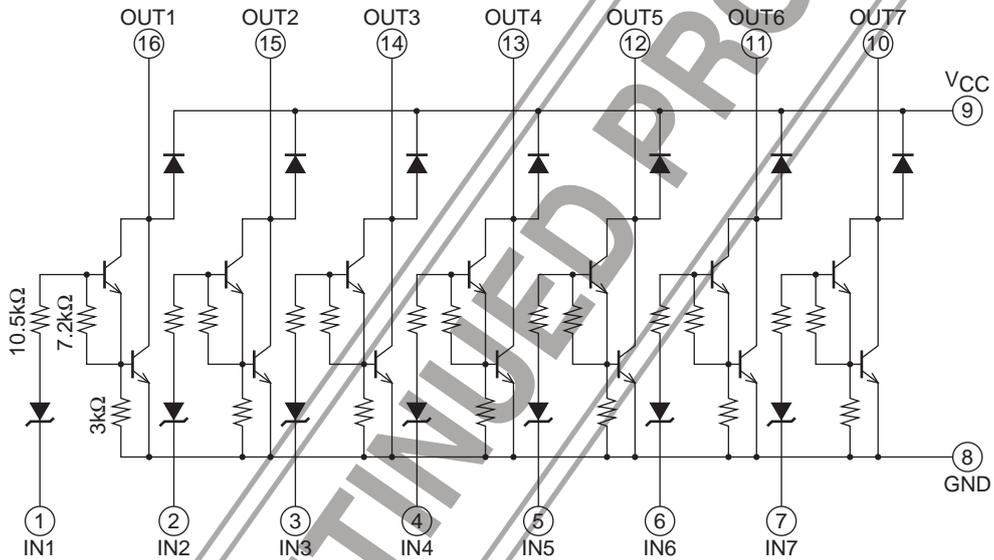
# LB1231,1232,1233,1234

## Equivalent Circuit

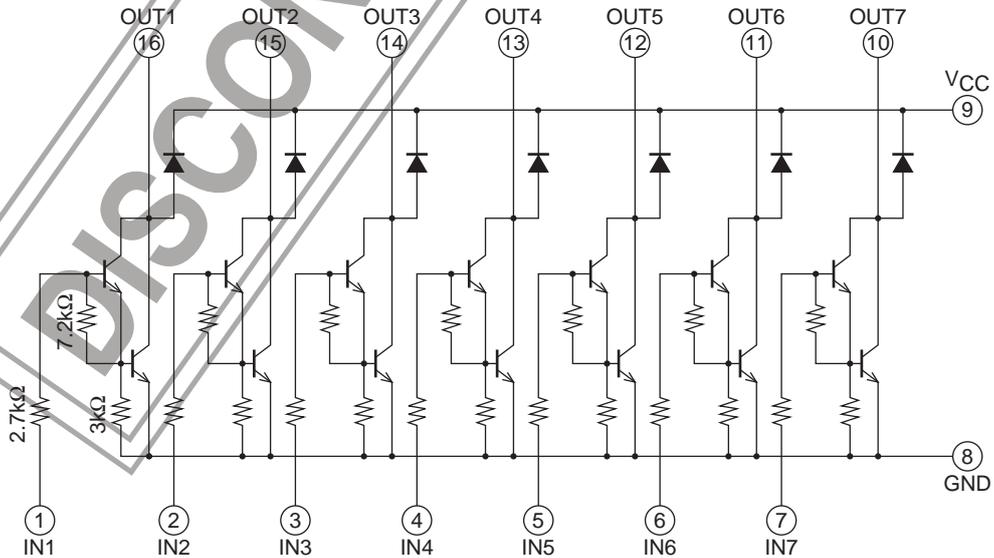
LB1231



LB1232

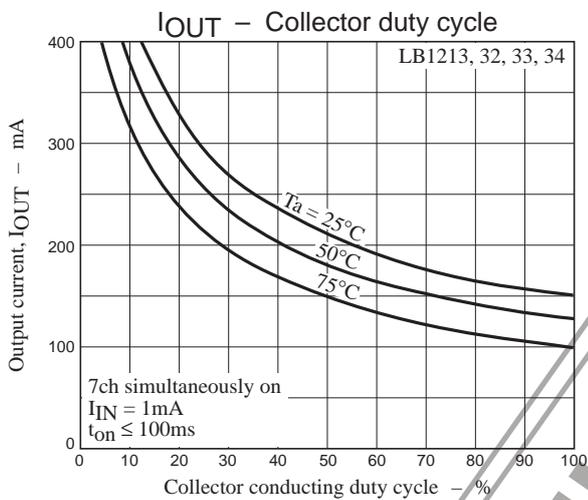
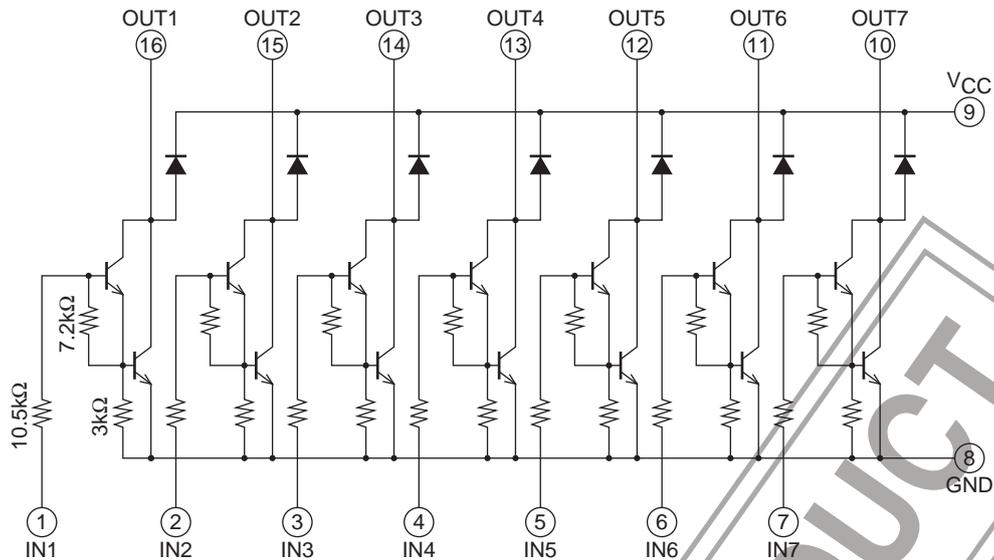


LB1233



# LB1231,1232,1233,1234

LB1234



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