

|  |          |                      |
|--|----------|----------------------|
| <b>SANYO</b>   | NO.1188D | <b>LB1231 Series</b> |
| <b>High-Voltage, Large Current Darlington Transistor Array</b> |          |                      |

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 ( $V_{CE0} \geq 50V$ ), large-current ( $I_{Cmax} = 500mA$ ) drive

- LB1231 . Drivable by TTL, MOS output
- LB1232 . Contains base current limiting resistors, Zener diodes for level shift.
  - . Direct drivable by 24V P MOS.
- LB1233 . Contains base current limiting resistors.
  - . Direct drivable by TTL, C MOS output.
- LB1234 . Contains base current limiting resistors.
  - . Direct drivable by C MOS, P MOS output.

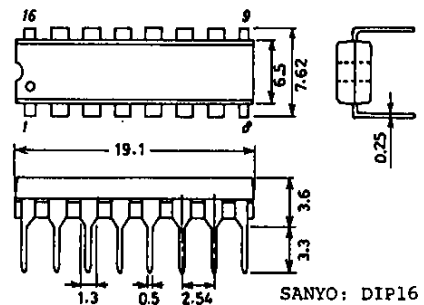
**Absolute Maximum Ratings at  $T_a = 25^\circ C$**

|                             |  |             | 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,<br>f=10Hz, duty, =23% | 2.8         | A          |
| Allowable Power Dissipation | $P_{dmax}$   | 1.5         | W          |
| Operating Temperature       | $T_{opr}$  | -20 to +75  | $^\circ C$ |
| Storage Temperature         | $T_{stg}$  | -40 to +150 | $^\circ C$ |

**Allowable Operating Conditions at  $T_a = 25^\circ C$**

|                         |           |                                   |              | unit |
|-------------------------|-----------|-----------------------------------|--------------|------|
| Output Supply Voltage   | $V_{OUT}$ | 50                                |              | V    |
| Input "H" Level Voltage | $V_{IH}$  | LB1232 $I_{OUT} = 350mA$          | 11 to 30     | V    |
|                         |           | LB1233 $I_{OUT} = 350mA$          | 3 to 30      | V    |
|                         |           | LB1234 $I_{OUT} = 350mA$          | 5 to 30      | V    |
| Input "L" Level Voltage | $V_{IL}$  | LB1231/33 $I_{OUT} \leq 100\mu A$ | -0.3 to +0.3 | V    |
|                         |           | LB1232 $I_{OUT} \leq 100\mu A$    | -0.3 to +6.0 | V    |
|                         |           | LB1234 $I_{OUT} \leq 100\mu A$    | -0.3 to +0.7 | V    |

**Package Dimensions 3064-D16TR**  
(unit : mm)



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LB1231,1232,1233,1234

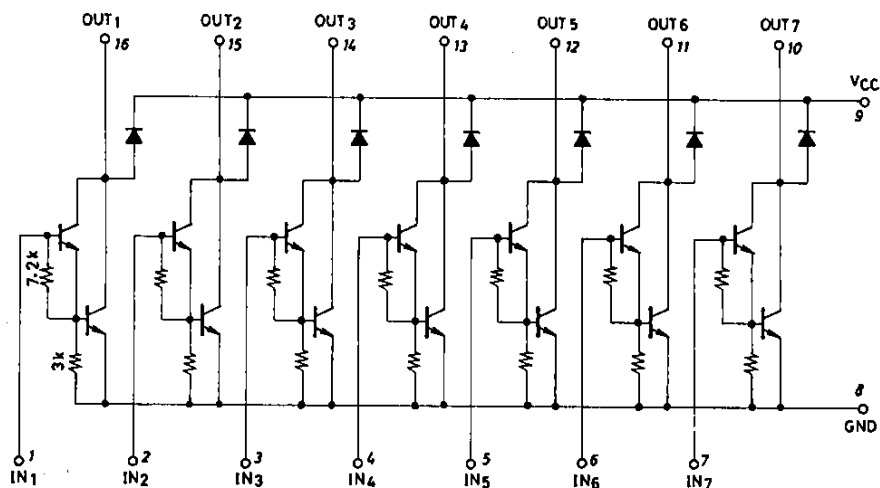
Electrical Characteristics at  $T_a=25^\circ\text{C}$

|                                    |             |  | min  | typ  | max | unit          |
|------------------------------------|-------------|--|------|------|-----|---------------|
| Output Leak Current                | $I_{OFF}$   | $V_{OUT}=50V$                                |      |      | 100 | $\mu\text{A}$ |
| Output Voltage                     | $V_{OH1}$   | $I_{IN}=0.25\text{mA}, I_{OUT}=100\text{mA}$ | 0.9  | 1.1  |     | V             |
|                                    | $V_{OH2}$   | $I_{IN}=0.35\text{mA}, I_{OUT}=200\text{mA}$ | 1.1  | 1.3  |     | V             |
|                                    | $V_{OH3}$   | $I_{IN}=0.5\text{mA}, I_{OUT}=350\text{mA}$  | 1.3  | 1.6  |     | V             |
|                                    | $V_{OH4}$   | $I_{IN}=1\text{mA}, I_{OUT}=400\text{mA}$    |      | 2.4  |     | V             |
| Input Voltage                      | $V_{IN}$    | LB1231 $I_{IN}=1\text{mA}$                   | 1.35 | 1.7  |     | V             |
| Input Current                      | $V_{IN}$    | LB1232 $V_{IN}=17V$                          | 0.82 | 1.25 |     | mA            |
|                                    |             | LB1233 $V_{IN}=3.85V$                        | 0.93 | 1.35 |     | mA            |
|                                    |             | LB1234 $V_{IN}=5V$                           | 0.35 | 0.5  |     | mA            |
|                                    |             | LB1234 $V_{IN}=12V$                          | 1.00 | 1.45 |     | mA            |
| Spark Killer Diode Leak Current    | $I_{R(S)}$  | $V_{R(S)}=50V$                               |      |      | 100 | $\mu\text{A}$ |
| Spark Killer Diode Forward Voltage | $V_{F(S)1}$ | $I_{F(S)}=350\text{mA}$                      |      |      | 2.0 | V             |
|                                    | $V_{F(S)2}$ | $I_{F(S)}=400\text{mA}$                      |      |      | 2.4 | V             |

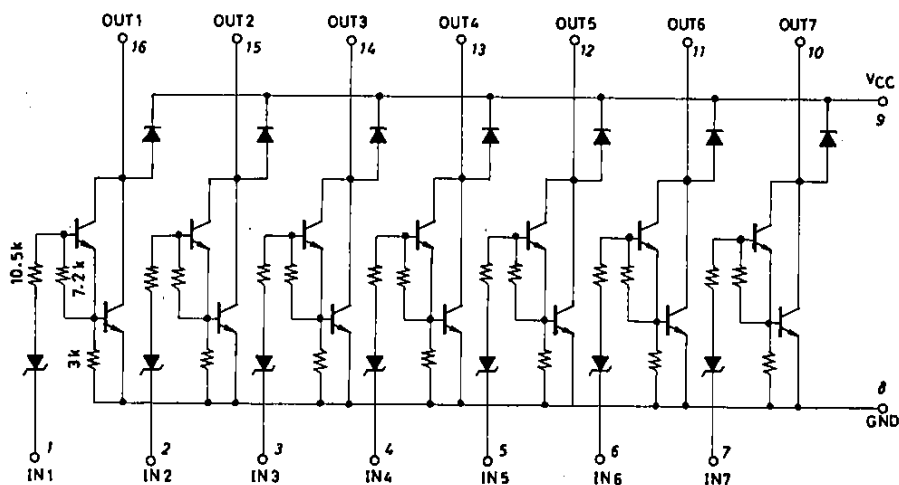
Equivalent Circuits

Unit (resistance:  $\Omega$ )

LB1231



LB1232

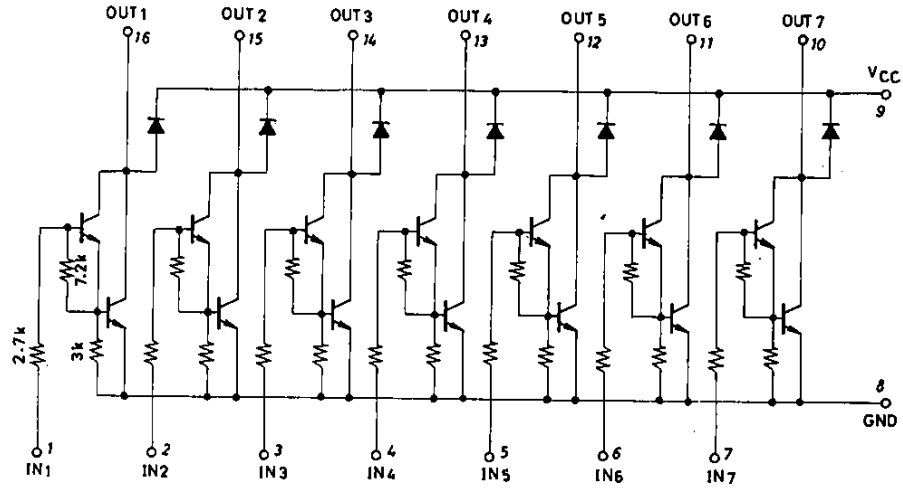


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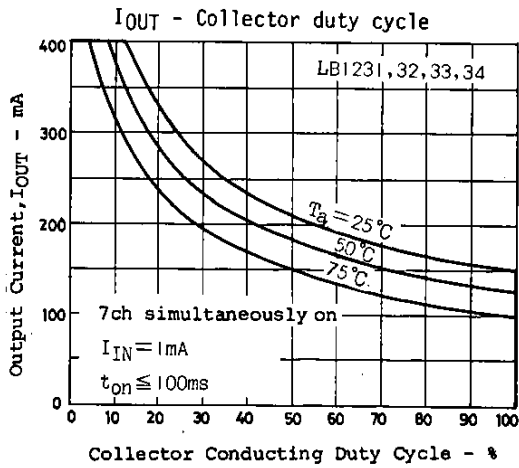
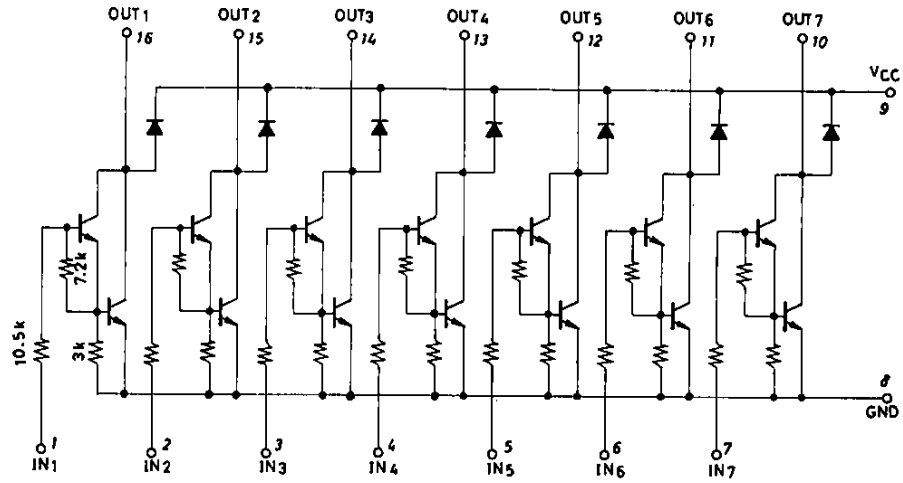
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Unit (resistance:  $\Omega$ )

LB1233



LB1234



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