

# LB1938T

Continued from preceding page.

| Parameter                   | Symbol            | Conditions                     | Ratings     | Unit |
|-----------------------------|-------------------|--------------------------------|-------------|------|
| Allowable power dissipation | $P_d \text{ max}$ | Mounted on a specified board * | 400         | mW   |
| Operating temperature range | $T_{opr}$         |                                | -30 to +85  | °C   |
| Storage temperature range   | $T_{stg}$         |                                | -55 to +150 | °C   |

Note \*: Mounted on a specified board: 114.3mm×76.1mm×1.5mm, glass epoxy resin, wiring density 20%

## Allowable Operating Range at $T_a = 25^\circ\text{C}$

| Parameter                | Symbol   | Conditions | Ratings      | Unit |
|--------------------------|----------|------------|--------------|------|
| Supply voltage           | $V_{CC}$ |            | 2.2 to 10    | V    |
| Input high-level voltage | $V_{IH}$ |            | 2.0 to 9.5   | V    |
| Input low-level voltage  | $V_{IL}$ |            | -0.3 to +0.3 | V    |

## Electrical Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC} = 3\text{V}$

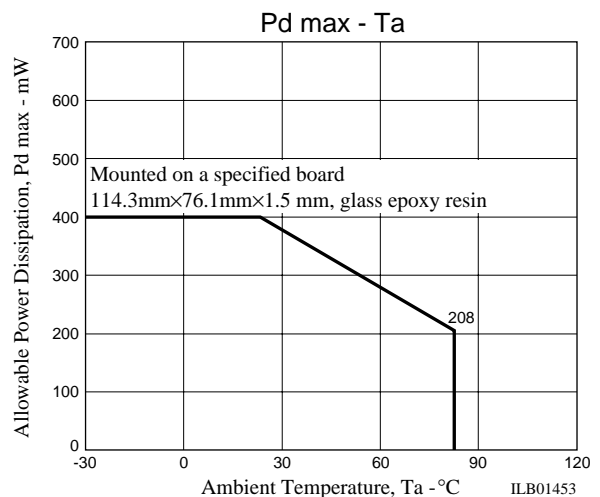
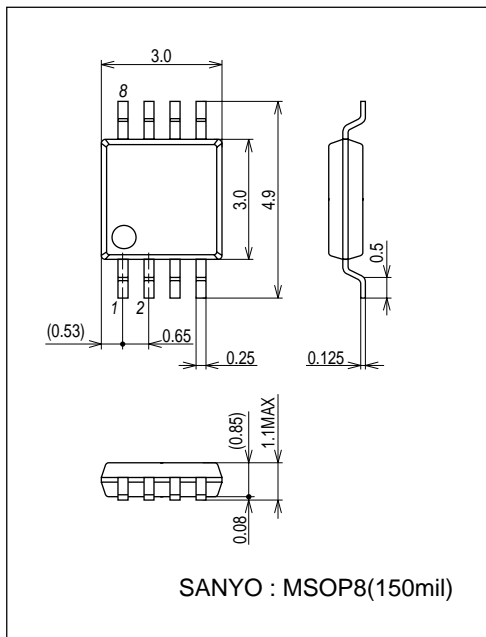
| Parameter                                | Symbol      | Conditions   | Ratings |      |      | Unit |
|--|-------------|--|---------|------|------|------|
|  |             |  | min     | typ  | max  |      |
| Circuit current                          | $I_{CC1}$   | Standby  |         | 0.1  | 5    | μA   |
|  | $I_{CC2}$   | Forward/reverse drive  |         | 14   | 19   | mA   |
|  | $I_{CC3}$   | Brake  |         | 20   | 29   | mA   |
| Output saturation voltage                | $V_{Osat1}$ | Upper+lower $I_O = 100\text{mA}$<br>for forward/reverse rotation |         | 0.15 | 0.2  | V    |
|  | $V_{Osat2}$ | Upper+lower $I_O = 300\text{mA}$<br>for forward/reverse rotation |         | 0.35 | 0.5  | V    |
|  | $V_{Osat3}$ | Upper $I_O = 100\text{mA}$ for braking                           |         | 0.1  | 0.15 | V    |
| Spark killer diode forward voltage       | $V_{SF}$    | $I_O = 300\text{mA}$   |         | 0.9  | 1.7  | V    |
| Spark killer diode inverse current       | $I_{RS}$    | $V_{OUT} = 10\text{V}$   |         | 0.1  | 5    | μA   |
| Input current                            | $I_{IN}$    | $V_{IN} = 5\text{V}$   |         | 75   | 98   | μA   |
| Thermal protection operating temperature | TSD         | Design target value *  |         | 180  |      | °C   |

Note \*: Design target value: Measurement with a single unit not made.

## Package Dimensions

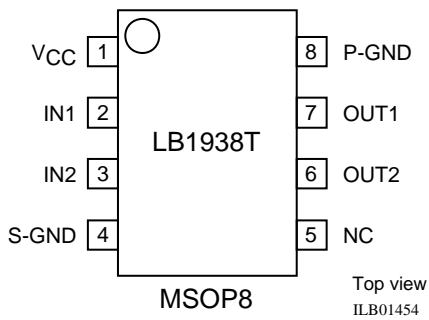
unit : mm (typ)

3245B



# LB1938T

## Pin Assignment

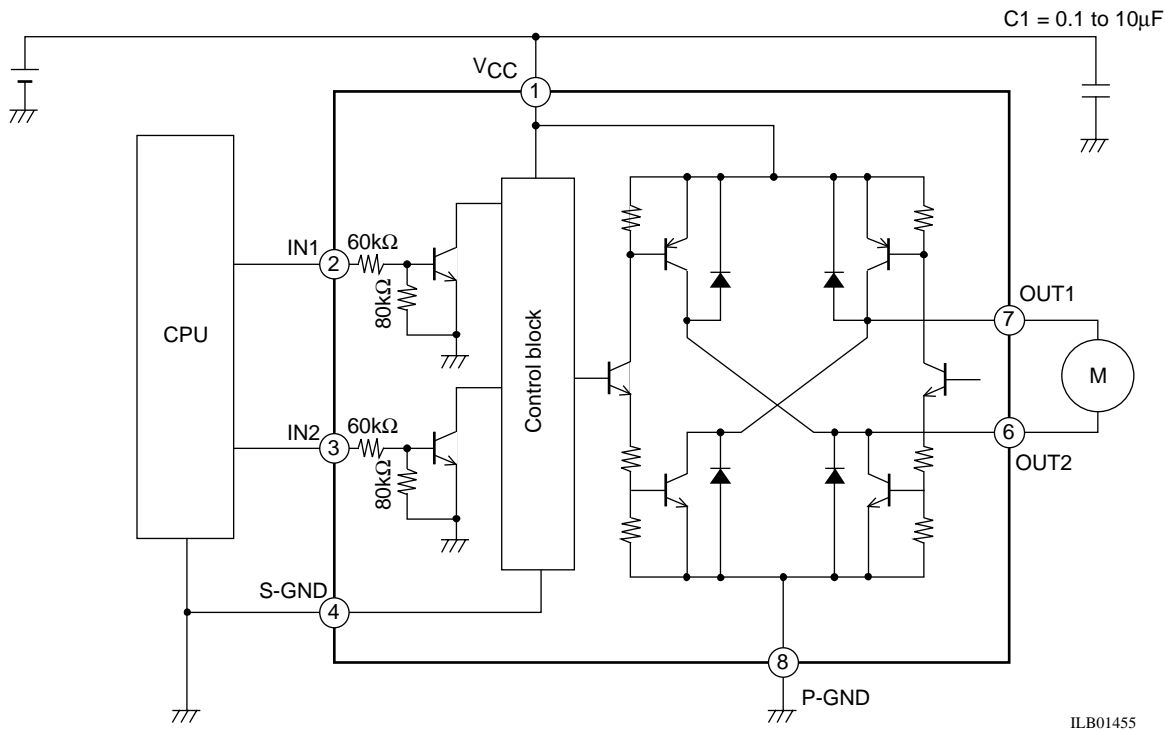


S-GND: GND for the control system  
P-GND: GND for the power system

## Truth Table

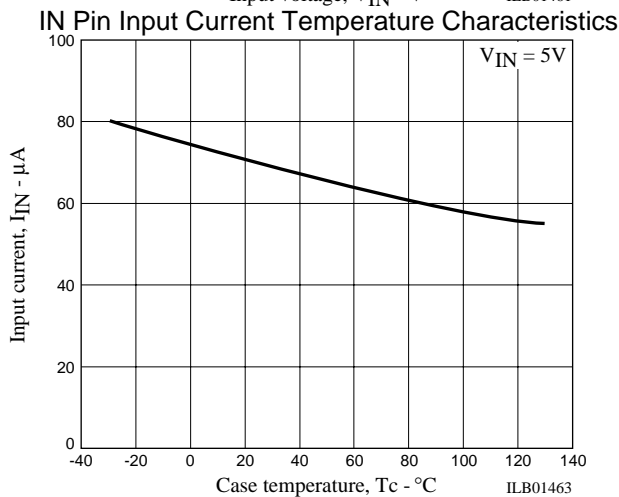
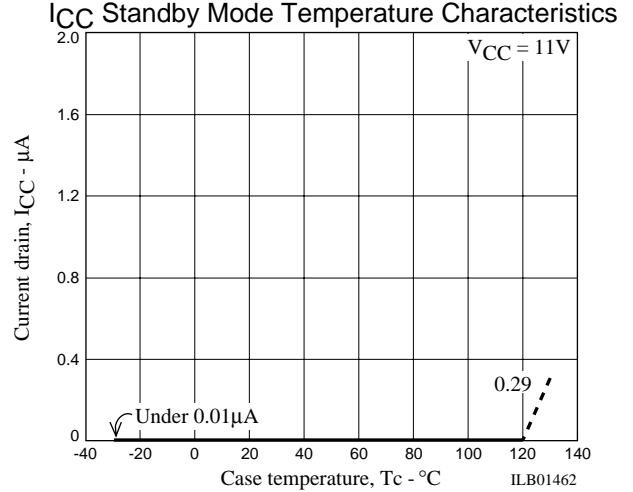
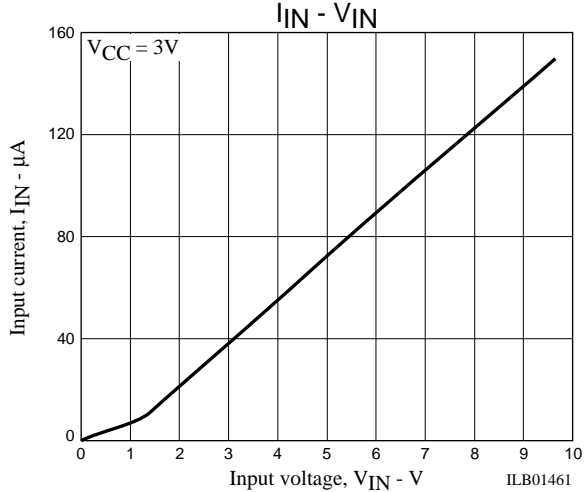
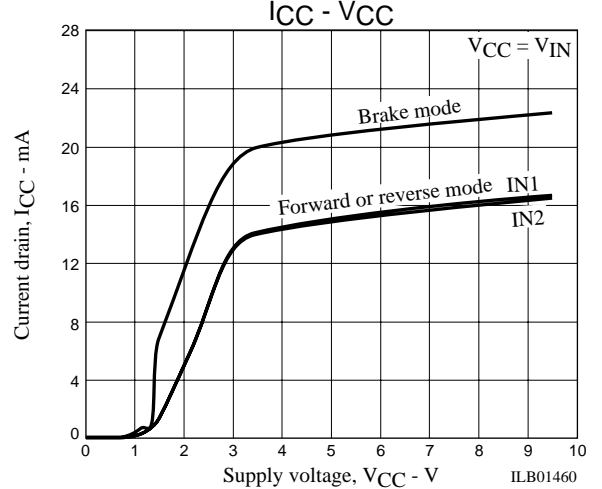
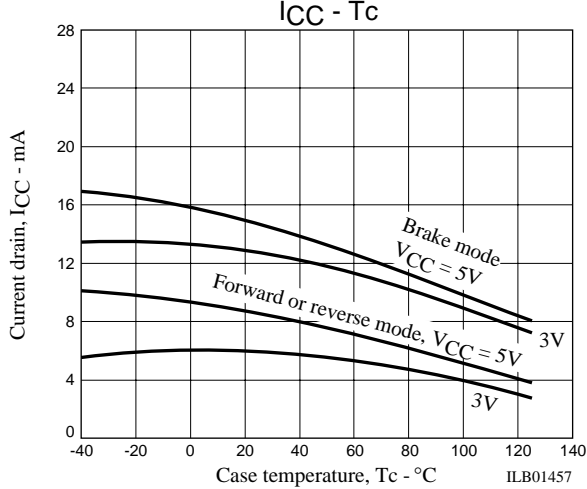
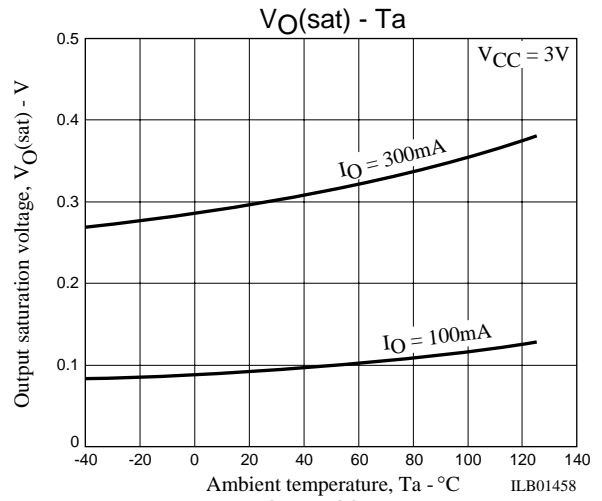
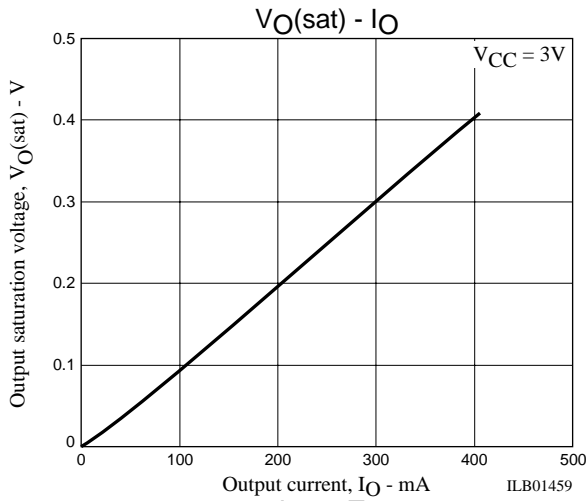
| IN1 | IN2 | OUT1 | OUT2 | Mode             |
|-----|-----|------|------|------------------|
| L   | L   | OFF  | OFF  | Standby          |
| H   | L   | H    | L    | Forward rotation |
| L   | H   | L    | H    | Reverse rotation |
| H   | H   | H    | H    | Brake            |

## Sample Application Circuit



## Cautions:

- VCC and GND lines suffer substantial fluctuation in the current quantity, causing a problem of line oscillation in certain cases. In this case, take following points into account:
  - (1) Use a thick and short wiring to reduce the wiring inductance.
  - (2) Insert a capacitor with satisfactory frequency characteristics near IC.
  - (3) Connect S-GND to the control system GND on the CPU side and P-GND to the power system GND.



- SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.
- SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production.
- Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of June, 2007. Specifications and information herein are subject to change without notice.