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## NTE7087 Integrated Circuit Bi-Directional Motor Driver

### **Description:**

The NTE7087 is a bi-directional motor driver IC in a 10-Lead SIP type package capable of direct driving 6V, 9V, and 12V motors. This device has a 2-input logic circuit and performs the functions of bi-directional driving and braking. The output voltage can be varied by using an external zener diode.

### **Features:**

- 2-Input Logic can be used to Exercise Control of Bi-Directional Driving and Braking
- On-Chip Elements to Absorb the Dash Current of the Motor
- Input Interfaceable with MOS LSI
- Output Voltage Variable by using an External Zener Diode

### **Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Maximum Supply Voltage,  $V_{CCmax}$  ..... 18V  
Input Voltage,  $V_{IN}$  .....  $-0.3V$  to  $V_{CC}$   
Output Current,  $I_{OUT}$  .....  $\pm 1.6A$   
Allowable Power Dissipation,  $P_{Dmax}$  ..... 1.2W  
Operating Temperature Range,  $T_{opr}$  .....  $-25^\circ$  to  $+75^\circ\text{C}$   
Storage Temperature Range,  $T_{stg}$  .....  $-55^\circ$  to  $+125^\circ\text{C}$

### **Recommended Operating Conditions:** ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

| Parameter      | Symbol    | Test Conditions | Min | Typ | Max | Unit |
|----------------|-----------|-----------------|-----|-----|-----|------|
| Supply Voltage | $V_{CC1}$ |                 | 7   | –   | 18  | V    |
|                | $V_{CC2}$ |                 | 5   | –   | 18  | V    |

**Electrical Characteristics:** ( $T_A = +25^{\circ}\text{C}$ ,  $V_{CC} = 12\text{V}$  unless otherwise specified)

| Parameter                      | Symbol     | Test Conditions                                  | Min | Typ  | Max  | Unit          |
|--------------------------------|------------|--------------------------------------------------|-----|------|------|---------------|
| Input Threshold Voltage        | $V_{th}$   | $R_L = \infty$                                   | 1.1 | 1.3  | 1.5  | V             |
| Minimum Input ON-State Current | $I_{IN}$   | $R_L = \infty$                                   | –   | 10   | 15   | $\mu\text{A}$ |
| Output Voltage                 | $V_O$      | $R_L = 60\Omega$ , $V_Z = 7.4\text{V}$           | 6.6 | 7.2  | 7.4  | V             |
| Output Leakage Current         | $I_{OL}$   | Pin5, Pin6 GND, $R_L = \infty$                   | –   | 0.01 | 1.0  | mA            |
| Current Dissipation            | $I_{CC}$   | Pin5, Pin6 GND, $R_L = \infty$                   | 3   | 6    | 10   | mA            |
| Saturation Voltage (Upper)     | $V_{sat1}$ | $V_{CC} = 12\text{V}$ , $I_{OUT} = 300\text{mA}$ | –   | 1.9  | 2.2  | V             |
|                                |            | $V_{CC} = 12\text{V}$ , $I_{OUT} = 500\text{mA}$ | –   | 1.9  | 2.3  | V             |
| Saturation Voltage (Lower)     | $V_{sat2}$ | $V_{CC} = 12\text{V}$ , $I_{OUT} = 300\text{mA}$ | –   | 0.25 | 0.5  | V             |
|                                |            | $V_{CC} = 12\text{V}$ , $I_{OUT} = 500\text{mA}$ | –   | 0.4  | 0.65 | V             |

**Truth Table:**

| Input |     | Output |      | Operation               |
|-------|-----|--------|------|-------------------------|
| IN1   | IN2 | OUT1   | OUT2 |                         |
| 0     | 0   | 0      | 0    | Braking                 |
| 1     | 0   | 1      | 0    | Forward (Reverse) Drive |
| 0     | 1   | 0      | 1    | Reverse (Forward) Drive |
| 1     | 1   | 0      | 0    | Braking                 |

Input Level 1: 2.0V or greater  
2: 0.7V or less

**Pin Connection Diagram**  
(Front View)



