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NTE1716
Integrated Circuit
Reversible Motor Driver for VCR

Features:

- Supply Voltage Range: 6V to 18V
- Power Dissipation: 2200mW
- Output Motor Driving Current up to 1600mA
- Two Control Logic Inputs Allow Switching of Three Output States:
  - Forward
  - Reverse
  - Braking
- Low Standby Current
- Adjustable Output Voltage Enables Motor Speed Control Using Control Pin Voltage
- Interfaces with CMOS Devices
- Built–In Components to Absorb Motor Rush Currents

Applications:

- Video Tape Recorders
- Cassette Tape Recorders

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Supply Voltage, V_{CC} 18V
Power Dissipation (T_A = +25°C), P_D 2200mW
Derate Above +25°C . . . . . 22mW/°C
Output Current (Pulse Width = 500µs, Duty Cycle = 1%), I_O 1.6A
Input Voltage, V_{IN} . . . . . –0.3V to V_{CC}
Operating Temperature Range, T_{opr} . . . . . –20° to +75°C
Storage Temperature Range, T_{stg} . . . . . –55° to +125°C

Recommended Operating Conditions: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage 1 (Logic)	V_{CC1}		6	–	18	V
Supply Voltage 2 (Motor)	V_{CC2}		6	–	18	V

Electrical Characteristics: (T_A = +25°C, V_{CC1} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Current Consumption	I_{CC}	F_{IN} = R_{IN} = GND, R_L = Infinity	–	5.5	10	mA
Minimum Input ON Current	I_{IN}	R_L = Infinity	–	10	50	µA
Input Threshold Voltage	V_{TH}	R_L = Infinity	0.7	1.2	2.0	V
Output Leakage Current	I_{OL}	F_{IN} = R_{IN} = GND, R_L = Infinity	–	–	1.0	mA
Output Voltage	V_O	R_L = 60Ω, ZD = 7.4V	6.6	7.2	–	V

Logic Inputs and Outputs

F_{IN}	R_{IN}	V_{out1}	V_{out2}
LOW	LOW	LOW	LOW
HIGH	LOW	HIGH	LOW
LOW	HIGH	LOW	HIGH
HIGH	HIGH	LOW	LOW

Circuit Operation:

Forward and Reverse Control

By changing the direction of current flow between OUT1 and OUT2, the direction of motor rotation is changes (Refer to the input–output truth table). When F_{IN} is HIGH and R_{IN} in LOW, current flows from OUT1 to OUT2. When F_{IN} is LOW and R_{IN} is HIGH, current flolws from OUT2 to OUT1.

Forced Stop

Setting R_{IN} and F_{IN} both HIGH or both LOW puts both output pins at the same potential, shutting off the supply current to the motor. When this happens, the motor generates a reverse current that produces a braking action.

Rush Current Absorption Circuit

The high voltage that appears on the OUT1 and the OUT2 (when the motor reverses) is sensed by an internal comprator, which turns on an internal circuit that absorbs the rush current.

Drive Circuit

The drive circuit supplies the current necessary to drive a motor connected between the OUT1 and OUT2 terminals. The forward direction of the motor is the direction of rotation when current flows from OUT1 to OUT2 and the reverse direction is the direction of rotation when current flows from OUT2 to OUT1. The output voltage (V_{OUT}) applied to the motor is given by the equation:

V_{OUT} (V) = V_{ZD} – $V_{CE(sat)}$ = V_{ZD} – 0.2(I_{OUT} = 100mA)

where:
V_{ZD} is the voltage across the zener diode connected between Pin4 (V_{REF}) and ground.

If Pin4 is left open, the output vootage (V_{OUT}) is given by the equation:

V_{OUT} (V) = V_{CC1} – $V_{CE(sat)}$ (PNP) – 2V_F – $V_{CE(sat)}$
= V_{CC1} – 1.8(I_{OUT} = 100mA)

Pin Connection Diagram
(Front View)