M54546L

BI-DIRECTIONAL MOTOR DRIVER

DESCRIPTION

The M54546L, BI-DIRECTIONAL MOTOR DRIVER, consists of a full bridge power driver designed for D-C motor control.

FEATURES

- Wide operating voltage range (V_{CC}= 4 ~16V)
- TTL, PMOS and CMOS compatible input
- Low output saturation voltage
- Integral diodes for transient suppression
- Small single-in-line package
- Braking mode input

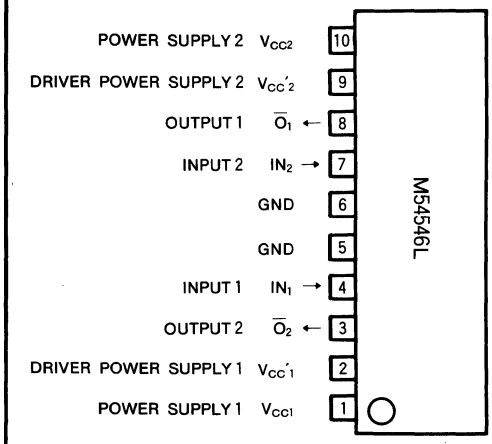
APPLICATION

Audio, video cassette recorder

FUNCTION

The M54546L, full bridge motor driver, has the logic circuitry and non-darlington power drivers for bidirectional control of D-C motors operating at currents up to 700mA. A braking mode by switching the both inputs high may make easier to control the motor. The both of the separated power supplies for the logic circuitry and the drivers are usable for motor speed control. The power supply of the predriver is connected with the driver power supply to have a wider control range of motor supply voltage.

PIN CONFIGURATION (TOP VIEW)

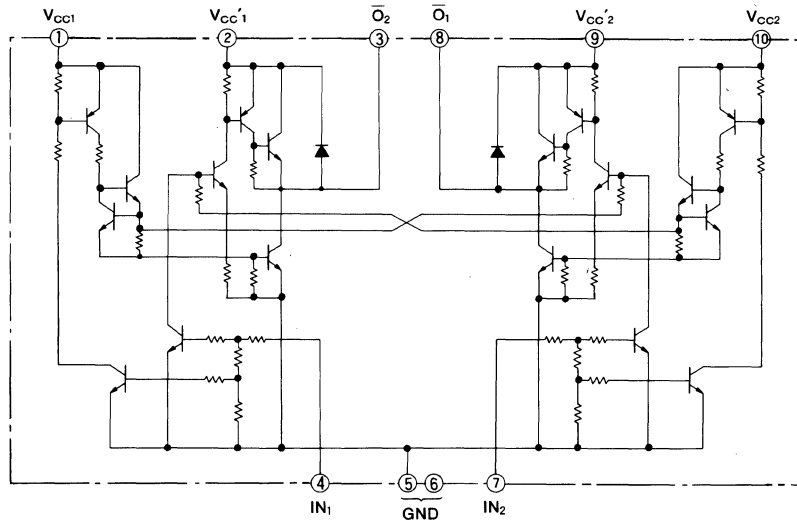


Outline 10P5

LOGIC TRUTH TABLE

INPUT		OUTPUT		NOTE
IN_1	IN_2	$\overline{O}_1$	$\overline{O}_2$	
L	L	"OFF" state	"OFF" state	Open
H	L	H	L	Ω
L	H	L	H	Ω
H	H	L	L	Braking

CIRCUIT SCHEMATIC



ABSOLUTE MAXIMUM RATINGS (T_a=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		−0.5～+16	V
V_{CC}'	Driver supply voltage		−0.5～+16	V
V_I	Input voltage		0～V_{CC}	V
V_O	Output voltage		−0.5～V_{CC}'+2.5	V
$I_{O(max)}$	Peak output current	t_{op}=10ms: Repetitive cycle 0.2Hz max	±700	mA
I_O	Continuous output current		±150	mA
P_d	Power dissipation	T_a=75℃	600	mW
T_{opr}	Operating ambient temperature range		−10～+75	℃
T_{stg}	Storage temperature range		−55～+125	℃

RECOMMENDED OPERATING CONDITIONS (T_a=25℃, unless otherwise noted)

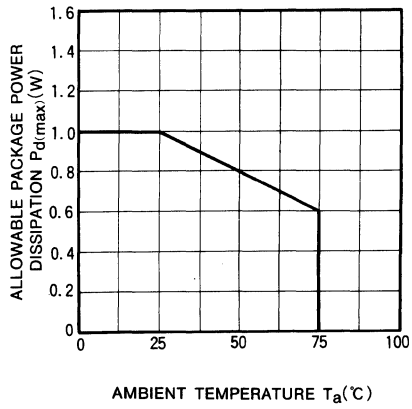
Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		4	12	15	V
I_O	Continuous output current				±300	mA
V_{IH}	"H" Input voltage		2		V_{CC}	V
V_{IL}	"L" Input voltage		0		0.4	V
t_B	Motor braking interval		100			ms

ELECTRICAL CHARACTERISTICS (T_a=25℃, unless otherwise noted)

Symbol	Parameter	Test conditions			Limits			Unit
					Min	Typ	Max	
$I_{O(leak)}$	Output leakage current	V_{CC}=V_{CC}'=20V, V_{I1}=V_{I2}=2V	V_O=20V				100	μA
			V_O=0V				−100	
$V_{OH(1)}$	"H" Output saturation voltage (1)	V_{CC}=V_{CC}'=12V	V_{I1}=2V, V_{I2}=0V	$I_{OH(1)}$=−50mA	11.0			V
				$I_{OH(1)}$=−100mA	10.9			
$V_{OH(2)}$	"H" Output saturation voltage (2)	V_{CC}=V_{CC}'=12V	V_{I1}=0V, V_{I2}=2V	$I_{OH(2)}$=−50mA	11.0			V
				$I_{OH(2)}$=−100mA	10.9			
$V_{OL(1)}$	"L" Output saturation voltage (1)	V_{CC}=V_{CC}'=12V	V_{I1}=0V, V_{I2}=2V	$I_{OL(1)}$=50mA			0.3	V
				$I_{OL(1)}$=100mA			0.35	
			V_{I1}=V_{I2}=2V				0.35	
$V_{OL(2)}$	"L" Output saturation voltage (2)	V_{CC}=V_{CC}'=12V	V_{I1}=2V, V_{I2}=0V	$I_{OL(2)}$=50mA			0.3	V
				$I_{OL(2)}$=100mA			0.35	
			V_{I1}=V_{I2}=2V				0.35	
$I_{IH(1)}$	"H" Input current (1)	V_{CC}=V_{CC}'=12V, V_{I1}=2V, V_{I2}=0V			70		200	μA
$I_{IH(2)}$	"H" Input current (2)	V_{CC}=V_{CC}'=12V, V_{I1}=0V, V_{I2}=2V			70		200	μA
I_{CC}	Supply current	V_{CC}=V_{CC}'=16V	V_{I1}=2V, V_{I2}=0V				30	mA
			V_{I1}=0V, V_{I2}=2V					
			V_{I1}=V_{I2}=2V				60	mA
			V_{I1}=V_{I2}=0V			0		mA

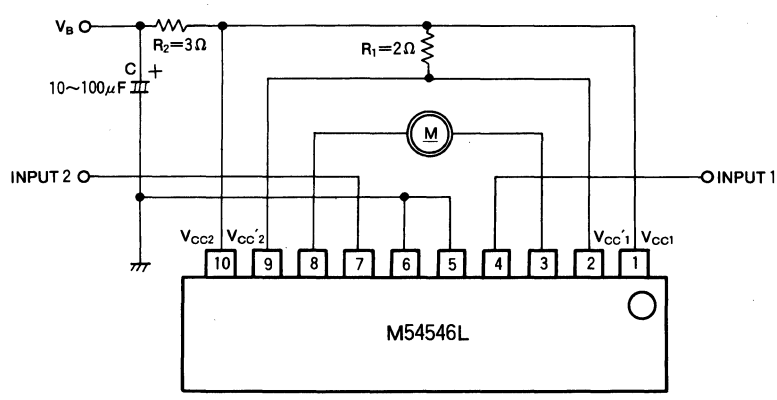
TYPICAL CHARACTERISTICS

ALLOWABLE AVERAGE POWER DISSIPATION



TYPICAL APPLICATION

1)



2) MOTOR SPEED CONTROL BY THE V_{CC}'