

M54545L

BI-DIRECTIONAL MOTOR DRIVER

DESCRIPTION

The M54545L, BI-DIRECTIONAL MOTOR DRIVER, consists of a full bridge power driver designed for D-C motor control.

FEATURES

- Wide operating voltage range ($V_{CC} = 3 \sim 16V$)
- Low output saturation voltage
- Integral diodes for transient suppression
- 1.2A output current
- Braking mode input
- Low standby current

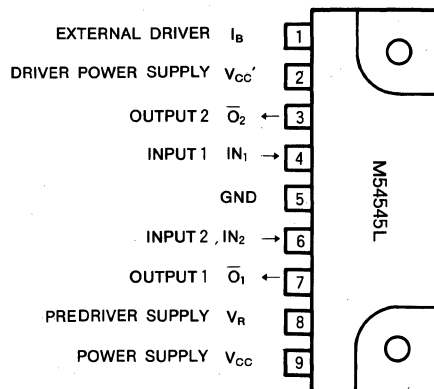
APPLICATION

Audio, video cassette recorder

FUNCTION

The M54545L, full bridge motor driver, has the logic circuitry and the quasi-darlington power driver for bidirectional control of D-C motors operating at currents up to 1.2A. A braking mode by switching the both inputs high may make easier to control the motor. The power supplies for the logic circuitry, the predrivers and the power drivers are separated so that the application circuit with the M54545L can be easily optimized for lower power consumption.

PIN CONFIGURATION (TOP VIEW)

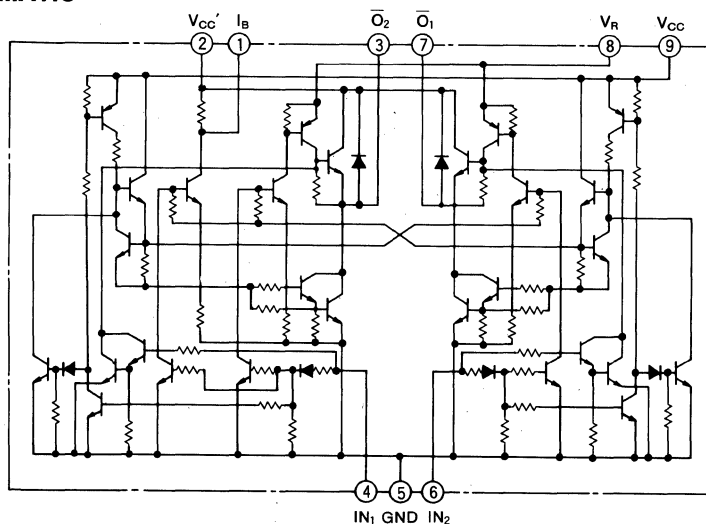


Outline 9P9

LOGIC TRUTH TABLE

Input		Output			Note
IN ₁	IN ₂	\bar{O}_1	\bar{O}_2	I _B	
L	L	"OFF" state	"OFF" state	H	Off
H	L	H	L	H	○
L	H	L	H	L	○
H	H	L	L	H	Braking

CIRCUIT SCHEMATIC



BI-DIRECTIONAL MOTOR DRIVER

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		-0.5~+16	V
V_R	Predriver 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
$I_o(\text{max})$	Peak output current	$t_{op}=10\text{ms}$ $V_{CC}\geq 5\text{V}$: Repetitive cycle 0.2Hz max	± 1.2	A
I_o	Continuous output current		± 330	mA
P_d	Power dissipation	$T_a=75^\circ\text{C}$	1.15	W
T_{opr}	Operating ambient temperature range		-10~+75	$^\circ\text{C}$
T_{stg}	Storage temperature range		-55~+125	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a=25^\circ\text{C}$, unless otherwise noted)

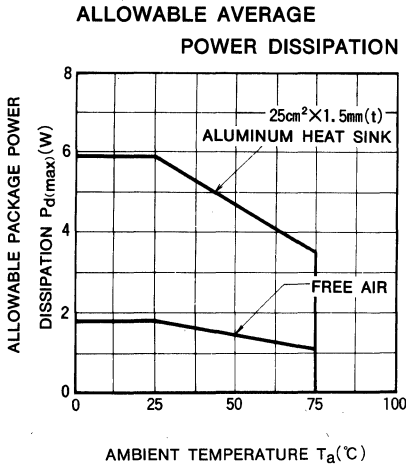
Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		3	12	15	V
I_o	Continuous output current				± 200	mA
V_{IH}	"H" Input voltage		3		V_{CC}	V
V_{iL}	"L" Input voltage		0		0.4	V
t_B	Motor braking interval		100			ms

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$I_o(\text{leak})$	Output leakage current	$V_{CC}=V_R=V_{CC}'=16\text{V}$ $V_{i1}=V_{i2}=0\text{V}$	$V_o=16\text{V}$		100	μA
			$V_o=0\text{V}$		-100	
$V_{OH(1)}$	"H" Output saturation voltage (1)	$V_{CC}=V_R=V_{CC}'=12\text{V}$ $I_{OH}=-200\text{mA}$	$V_{i1}=3\text{V}, V_{i2}=0\text{V}$	10.8		V
$V_{OH(2)}$	"H" Output saturation voltage (2)		$V_{i1}=0\text{V}, V_{i2}=3\text{V}$	10.8		V
$V_{OL(1)}$	"L" Output saturation voltage (1)	$V_{CC}=V_R=V_{CC}'=12\text{V}$ $I_{OL(1)}=200\text{mA}$	$V_{i1}=0\text{V}, V_{i2}=3\text{V}$		0.4	V
			$V_{i1}=3\text{V}, V_{i2}=3\text{V}$			
$V_{OL(2)}$	"L" Output saturation voltage (2)	$V_{CC}=V_R=V_{CC}'=12\text{V}$ $I_{OL(2)}=200\text{mA}$	$V_{i1}=3\text{V}, V_{i2}=0\text{V}$		0.4	V
			$V_{i1}=3\text{V}, V_{i2}=3\text{V}$			
$I_{IH(1)}$	"H" Input current (1)	$V_{CC}=V_R=V_{CC}'=12\text{V}$	$V_{i1}=3\text{V}, V_{i2}=0\text{V}$		700	μA
$I_{IH(2)}$	"H" Input current (2)	$V_{CC}=V_R=V_{CC}'=12\text{V}$	$V_{i1}=0\text{V}, V_{i2}=3\text{V}$		700	μA
			$V_{i1}=0\text{V}, V_{i2}=0\text{V}$		5	
I_{CC}	Supply current	$V_{CC}=V_R=V_{CC}'=12\text{V}$	$V_{i1}=3\text{V}, V_{i2}=0\text{V}$		10	mA
			$V_{i1}=0\text{V}, V_{i2}=3\text{V}$			
			$V_{i1}=0\text{V}, V_{i2}=0\text{V}$			
I_B	I_B Output current	$V_{CC}=V_R=V_{CC}'=12\text{V}, V_{iB}=12\text{V}, V_{i1}=0\text{V}, V_{i2}=3\text{V}$		1.0	15.0	mA

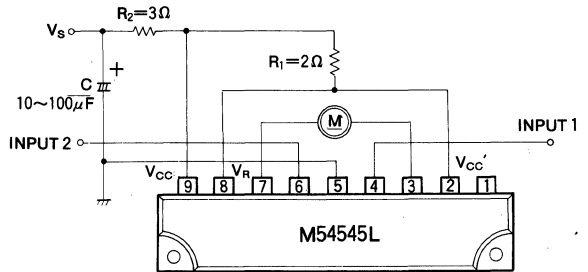
BI-DIRECTIONAL MOTOR DRIVER

TYPICAL CHARACTERISTICS



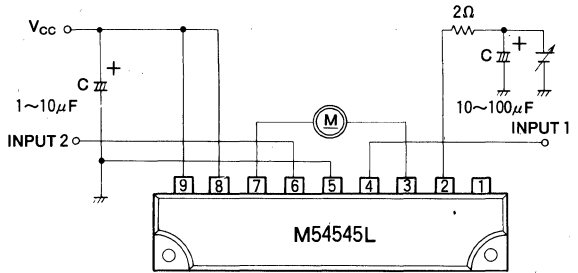
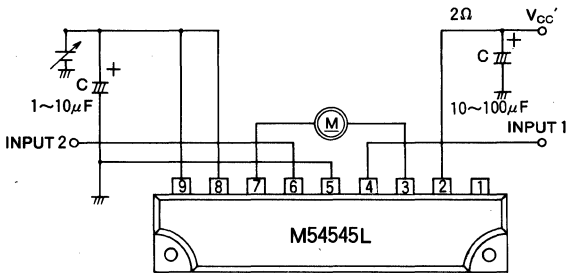
TYPICAL APPLICATION

1)



2) Motor speed control by the V_R and V_{CC}

3) Motor speed control by the V_{CC}'



4) Motor speed control by the V_R and V_{CC}'

5) Motor speed control by the V_R

