

M54837AL

MITSUBISHI (DGT L LOGIC)

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PLUNGER DRIVER

T-52-13-90

DESCRIPTION

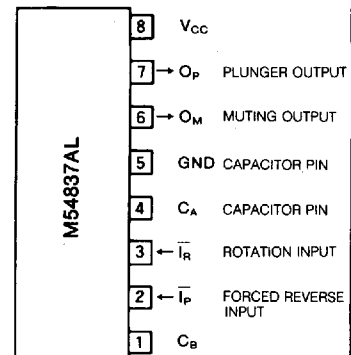
The M54837AL is a semiconductor integrated circuit consisting of an IIL plunger driver.

FEATURES

- Plunger is controlled by stoppage of the tape recorder motor rotation signal.
- A forced reverse input enables the output signal to be reversed at will.
- Muting output
- Two external capacitors control response time and pulse width of plunger output.
- Wide power supply voltage range ($V_{CC}=8\sim 16V$)
- Wide operating temperature range ($T_{opr}=-20\sim +80^{\circ}C$)

APPLICATION

Car stereo auto-reverse, auto-eject, control and drive plungers.

PIN CONFIGURATION (TOP VIEW)

Outline 8P5

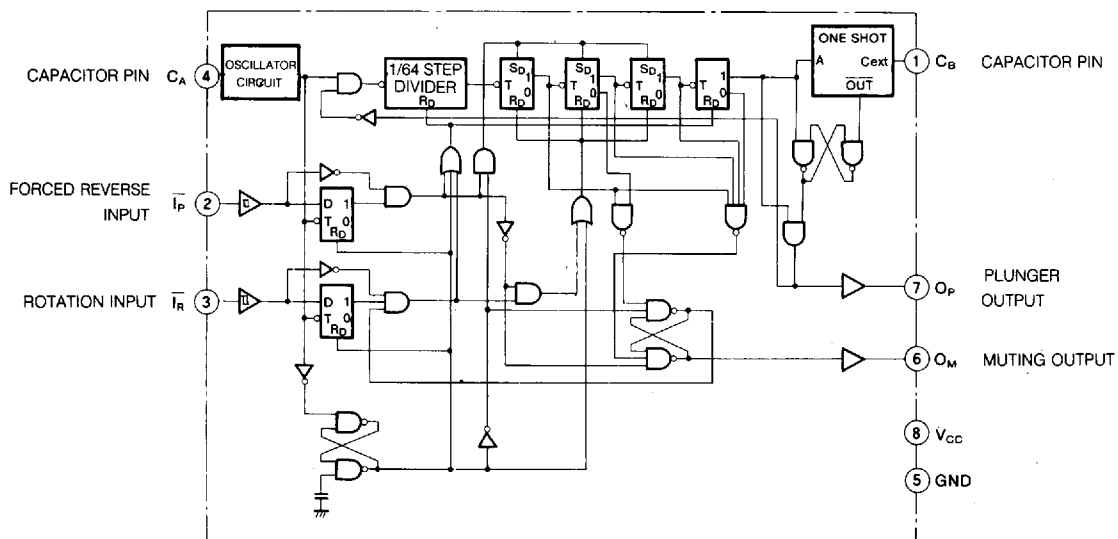
FUNCTIONAL DESCRIPTION

The M54837AL normally applies a rectangular wave to rotation input (I_R). The negative edge of I_R resets internal step divider and holds both plunger output (O_P) and muting output (O_M) in the low state. When I_R is held in the low or high state, the muting output will become high after a response time (T_{RES}) determined by external capacitor C_A . The plunger output will then become high after waiting time (T_W). Period of high state of plunger output (pulse width: T_{ON}) is

determined by external capacitor C_B .

The forced reverse input (I_P) is normally held in low or high state. The negative edge of this input signal sets muting output to high, and the plunger output follows after waiting time (T_W). The minimum period of low and high state for the rotation input and forced reverse input is given by following formula.

$$\tau_{Hmin.} = \tau_{Lmin.} (ms) > 132C_A (\mu F)$$

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS ($T_a = -20 \sim +80^\circ\text{C}$, unless otherwise noted)

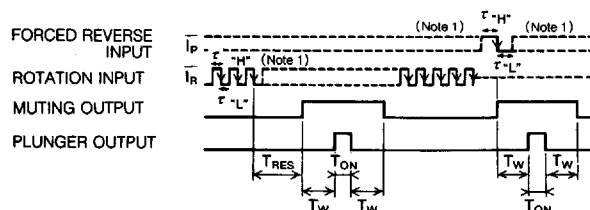
Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Power supply		18	V
V_i	Input voltage		V_{CC}	V
V_o	Output voltage	When output transistors are off.	7	V
P_d	Power dissipation		1000	mW
T_{opr}	Operating temperature		$-20 \sim +80$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a = -20 \sim +80^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{CC}	Power supply	8		16	V
I_{OH}	High output current			-70	mA
				-16	
C_A	External capacitor	0.005		5	μF
C_B	External capacitor	0.01		10	μF

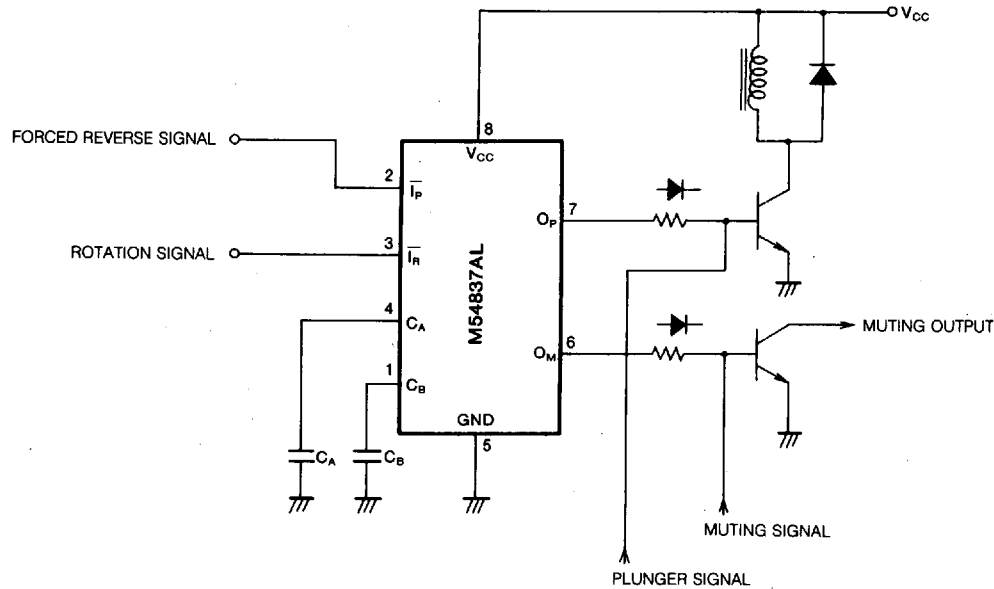
ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +80^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V_{IH}	High input voltage		2			V
V_{IL}	Low input voltage				0.4	V
I_{IH}	High input current	$V_{CC} = 16\text{V}, V_{IH} = 16\text{V}$			10	μA
I_{IL}	Low input current	$V_{CC} = 16\text{V}, V_{IL} = 0\text{V}$			-10	μA
I_{OH}	High output current	$V_{CC} = 8 \sim 16\text{V}, V_o = 0.8\text{V}$	-30	-50	-70	mA
			-6	-11	-16	
I_{OLK}	Output leakage current	$V_{CC} = 16\text{V}, V_o = 0\text{V}$			100	μA
$I_{CC, OFF}$	Power supply when $O_M = "L"$	$V_{CC} = 16\text{V}$ Output open		8	15	mA
$I_{CC, ON}$	Power supply when $O_P = "H"$	$V_{CC} = 16\text{V}$ Output open		9	17	mA
T_{ON}	Pulse width of plunger output	$V_{CC} = 16\text{V}, C_B = 1\mu\text{F}, T_a = 25^\circ\text{C}$	80	120	160	ms
T_{RES}	Output response time	$V_{CC} = 16\text{V}, C_A = 0.047\mu\text{F}, T_a = 25^\circ\text{C}$	950	1390	1800	ms

TIMING DIAGRAM

Note 1 : Dotted line Indicates settling can be either low or high.
 The values for T_{RES} , T_W , T_{ON} are given by following formulae.
 $T_{RES} (\text{ms}) \approx 29600 \times C_A (\mu\text{F})$
 $T_W = 1/7 T_{RES}$
 $T_{ON} (\text{ms}) = 120 \times C_B (\mu\text{F})$
 C_A and C_B indicate the values of the external capacitors.

APPLICATION EXAMPLE



Note 2 : When outputs O_P and O_M are connected with other signals in an OR configuration as shown in the figure, it should be done through resistor or diode. This will keep the output voltage within absolute maximum ratings when the output transistors of O_P and O_M are off and reduce or eliminate runaway current flowing through the IC pull-down resistor.