

SANYO

No.3664A

LB1657M**2-Phase Stepping Motor Driver**

The LB1657M is a dual bridge driver IC suited for use in 2-phase bipolar stepping motor driver for FDD (3 to 5.25 inches) head actuator. The maximum driver current \times voltage is $0.33\text{A} \times 12\text{V/bridge}$.

Features

- Power save function
- $\phi 1, \phi 2$ direction inputs are used to make driver output selection.
- Low saturation voltage
- Low current dissipation
- Direct controllable from MPU due to low input current
- Input level : TTL, LSTTL, 5V CMOS compatible
- On-chip thermal shutdown (TSD) circuit

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

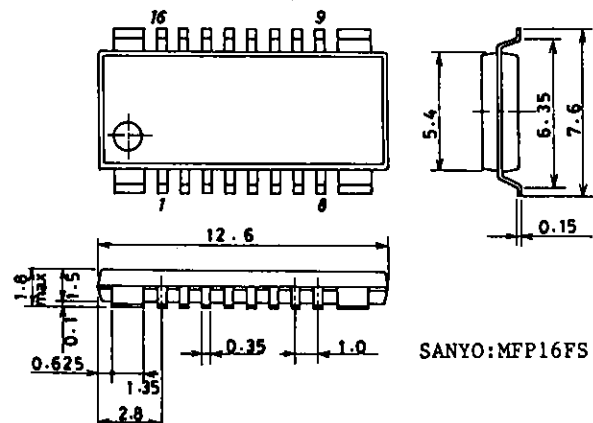
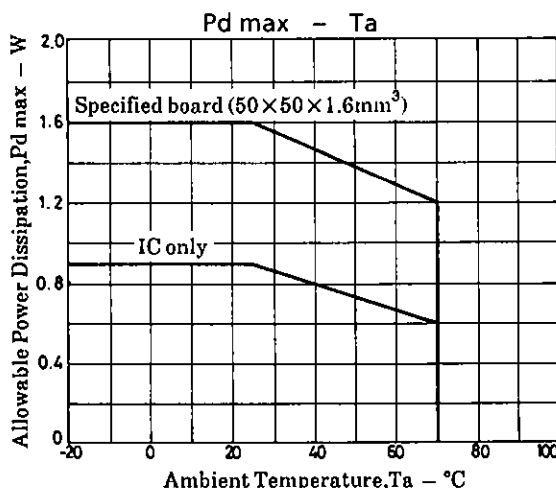
			unit
Logic Section Supply Voltage	V_{CC}	7	V
Seeking Supply Voltage	V_S	15	V
Input Voltage	V_I	0 to V_{CC}	V
Peak Seeking Current	$I_{O\text{ peak}}$	$t \leq 5\text{ms}$	500 mA
Continuous Seeking Current	I_{OS}		330 mA
Allowable Power Dissipation	$P_{d\text{ max}}$		0.9 W
Operating Temperature	T_{op}	-20 to +70	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +125	$^\circ\text{C}$

Allowable Operating Conditions at $T_a = 25^\circ\text{C}$

		min	typ	max	unit
Logic Section Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Seeking Supply Voltage	V_S	10.2	12.0	13.8	V

Package Dimensions 3097

(unit: mm)



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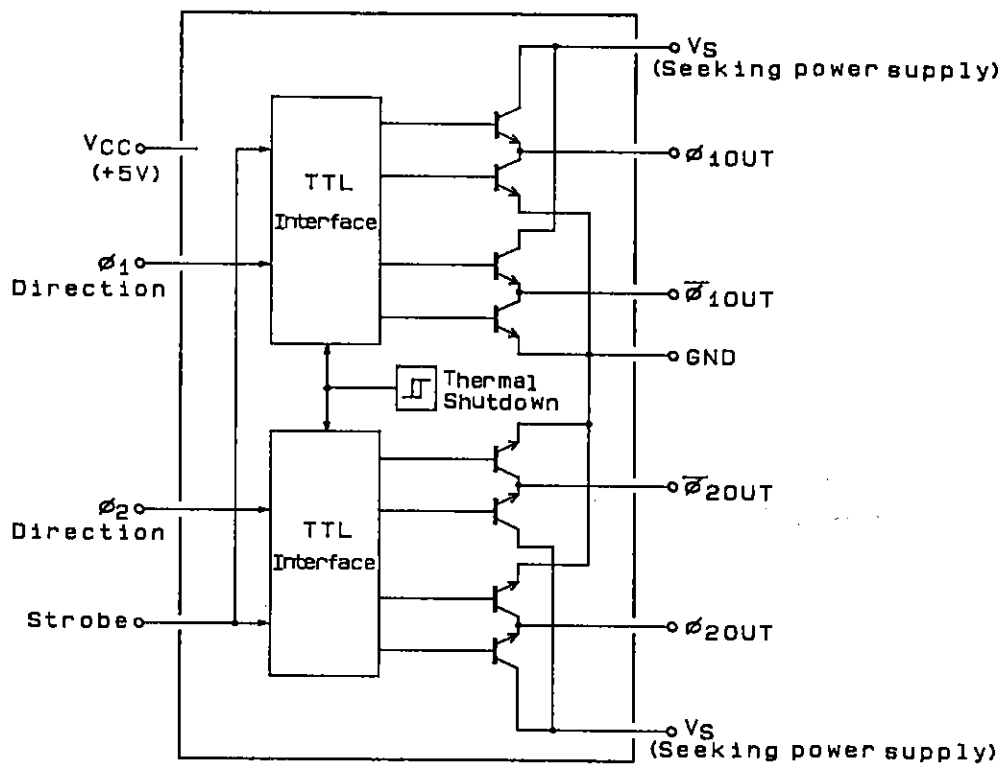
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $V_{S2} = 5\text{V}$, $V_{S1} = 12\text{V}$

			min	typ	max	unit
Input 'L'-Level Voltage	V_{IL}				0.8	V
Input 'H'-Level Voltage	V_{IH}		2.0			V
Input 'L'-Level Current	I_{IL}	$V_I = 0.8\text{V}$	-10		+10	μA
Input 'H'-Level Current	I_{IH}	$V_I = 2\text{V}$		6	10	μA
		$V_I = 5\text{V}$		0.55	1.0	mA
Current Dissipation	I_{CL}	STB=0.8V V_{CC}		25	33	mA
	I_{SL}	STB=0.8V V_S , Note 1			1	mA
	I_{CH}	STB=2.0V V_{CC}		25	33	mA
	I_{SH}	STB=2.0V V_S , Note 1		5	10	mA
Output Transistor Voltage	V_{CER}	$I_C = 10\text{mA}$	18			V
V_{S1} Saturation Voltage	V_{sat}	SB=0.8V, $I_O = 330\text{mA}$, Note 2		1.5	2.0	V
Clamp Voltage	V_F	$I_F = 330\text{mA}$ Upper		3		V
		$I_F = 330\text{mA}$ Lower		1.5		V
Delay Time	t_{PLH}			4		μs
	t_{PHL}			2		μs
TSD Operating Temperature	TSD		150			$^\circ\text{C}$
TSD Hysteresis	ΔT		25			$^\circ\text{C}$

Note) 1. Measure sum of currents at pins 4 and 13.

2. Measure sum of saturation voltages at upper and lower level.

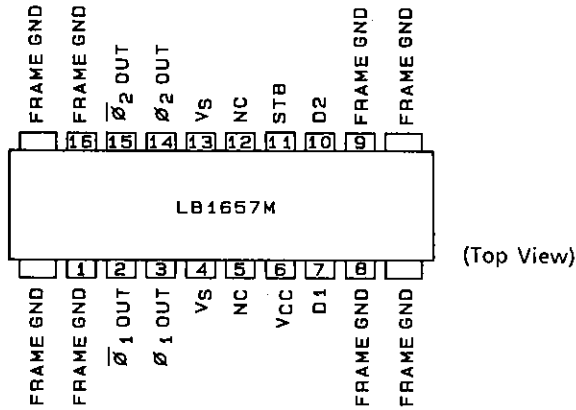
Equivalent Circuit Block Diagram



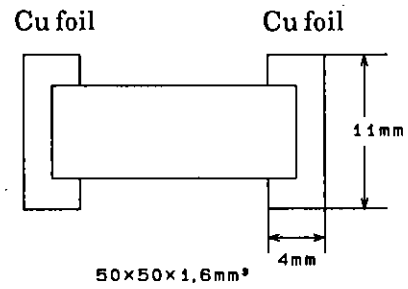
The $\phi 1$, $\phi 2$ direction inputs are used to make driver output selection and the power save input is used to select the driver source output from between 0V supply and 12V supply.

LB1657M

Pin Assignment

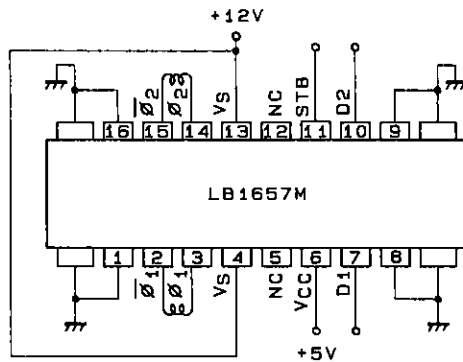


Specified board



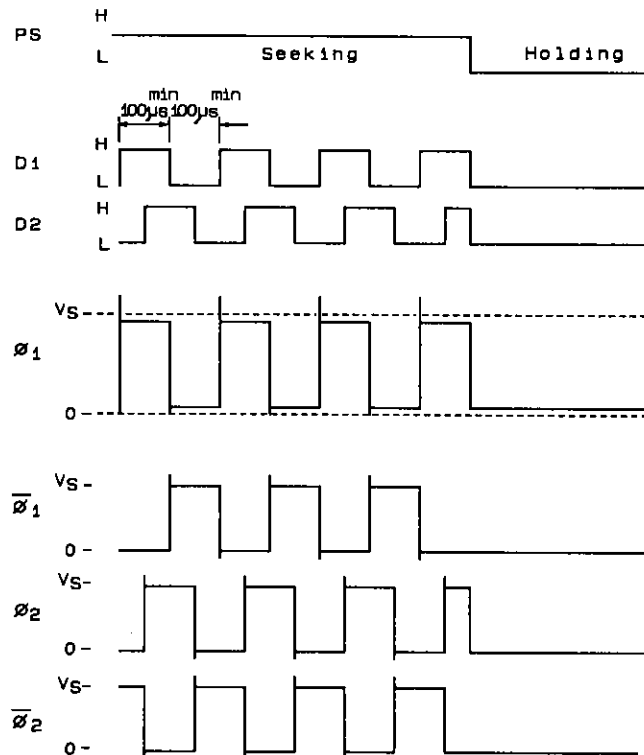
Sample Application Circuit

2-phase bipolar stepping motor driver



Note) Keep the Tarminial to Short 4 and 13

Timing Chart



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