

The LB1656 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 0.33A \times 12V/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 $T_a = 25^\circ\text{C}$

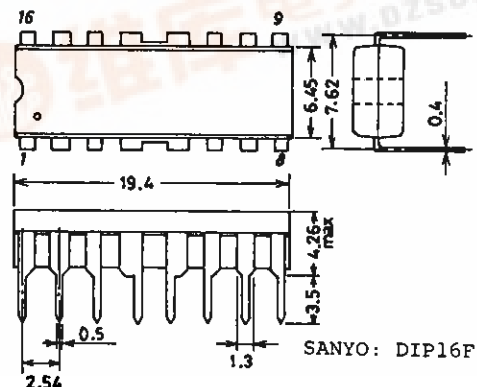
			unit
Logic Section Supply Voltage	V_{CC}	7	V
Seeking Supply Voltage	V_{S1}	15	V
Holding Supply Voltage	V_{S2}	7	V
Input Voltage	V_I	0 to V_{CC}	V
Peak Seeking Current	$I_{O\ peak}$ $t \leq 5\text{ms}$	500	mA
Continuous Seeking Current	I_{OS}	330	mA
Holding Current	I_{OH}	200	mA
Allowable Power Dissipation	$P_d\ max$	1.9	W
Operating Temperature	T_{opr}	-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_{S1}	10.2	12.0	13.8	V
Holding Supply Voltage	V_{S2}	4.5	5.0	5.5	V

Package Dimensions 3054A

(unit: mm)

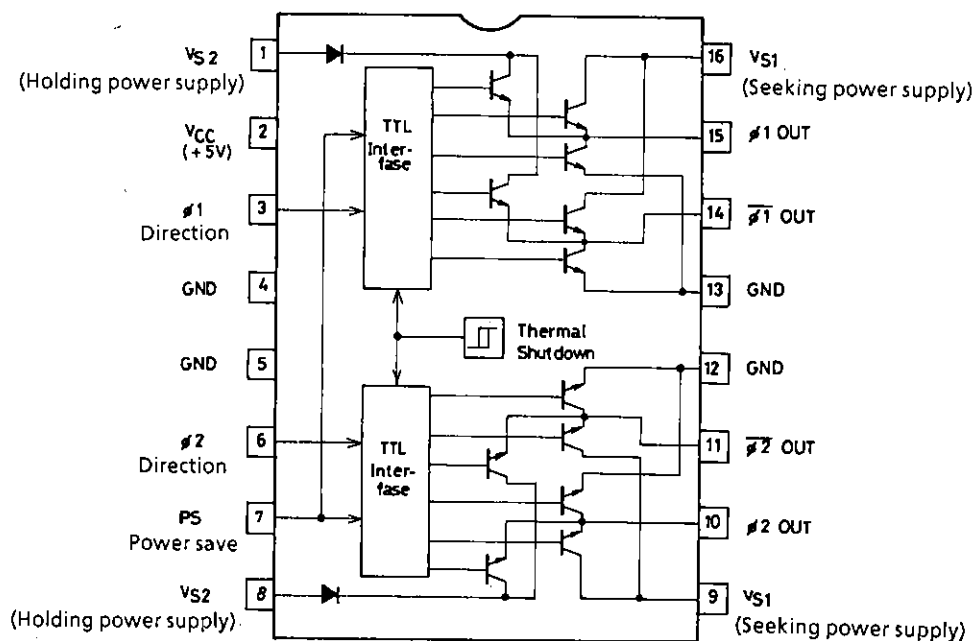


LB1656

Electrical Characteristics at $T_a = 25^\circ\text{C}, V_{CC} = 5\text{V}, V_{S1} = 12\text{V}, V_{S2} = 5\text{V}$				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}	$V_I = 2\text{V}$		2	10		μA	
Current Dissipation	I_{CC}	$PS = 0.8\text{V}, V_{CC}$		0.3	1.0		mA	
		$PS = 0.8\text{V}, V_{S1}, \text{Note 1}$		6	10		mA	
		$PS = 0.8\text{V}, V_{S2}, \text{Note 2}$				0.1		mA
		$PS = 2\text{V}, V_{CC}$		25	33		mA	
		$PS = 2\text{V}, V_{S1}, \text{Note 1}$			1	2		mA
		$PS = 2\text{V}, V_{S2}, \text{Note 2}$		2.5	4		mA	
Output Transistor Voltage	$V_{(BR)CER}$	$I_C = 10\text{mA}$	18				V	
V_{S1} Saturation Voltage	$V_{CE(sat)1}$	$PS = 0.8\text{V}, I_O = 330\text{mA}, \text{Note 3}$		1.5	2.0		V	
V_{S2} Saturation Voltage	$V_{CE(sat)2}$	$PS = 2.0\text{V}, I_O = 130\text{mA}, \text{Note 3}$		1.5	2.0		V	
Clamp Voltage	V_F	$I_F = 330\text{mA}, \text{upper}$		3			V	
		$I_F = 330\text{mA}, \text{lower}$		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 9 and 16.
 2. Measure sum of currents at pins 1 and 8.
 3. Measure sum of saturation voltages at upper and lower level.

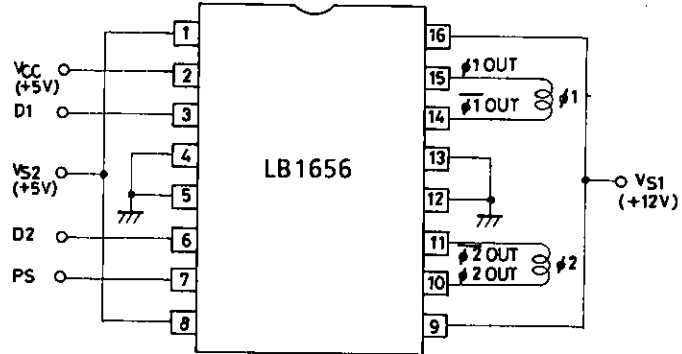
Equivalent Circuit Block Diagram



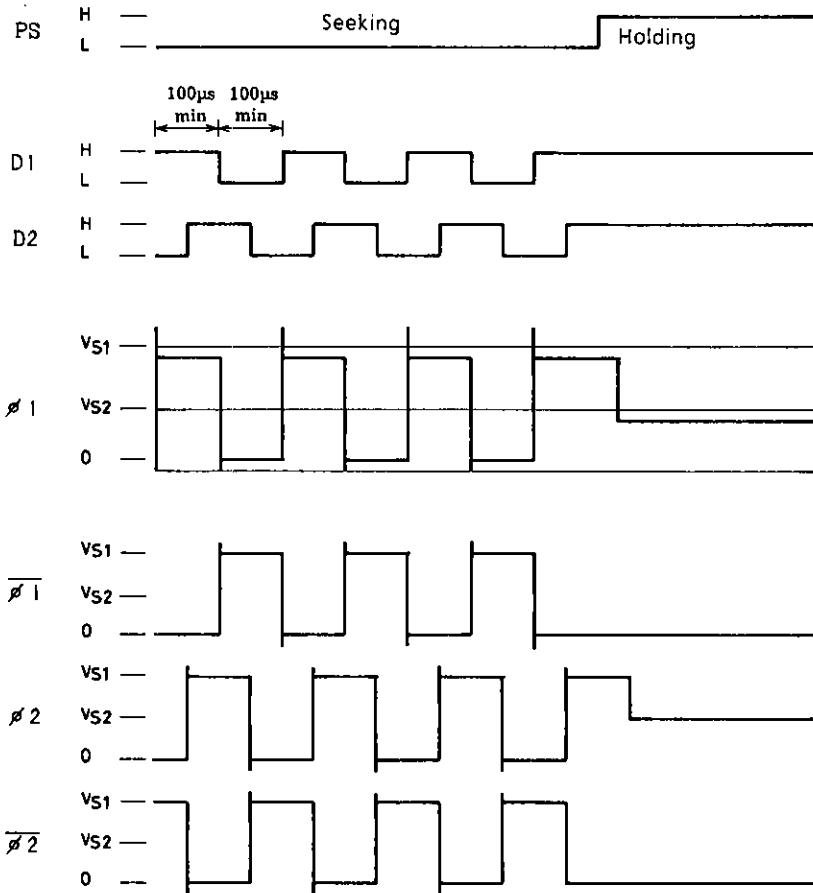
The $\phi 1, \phi 2$ direction inputs are used to make driver output selection and the power save input is used to select the driver source output from between 5V supply and 12V supply.

LB1656

Sample Application Circuit : 2-phase bipolar stepping motor driver



Timing Chart



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