

**SANYO****LB1656M****2-Phase Stepping Motor Driver****Overview**

The LB1656M 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.

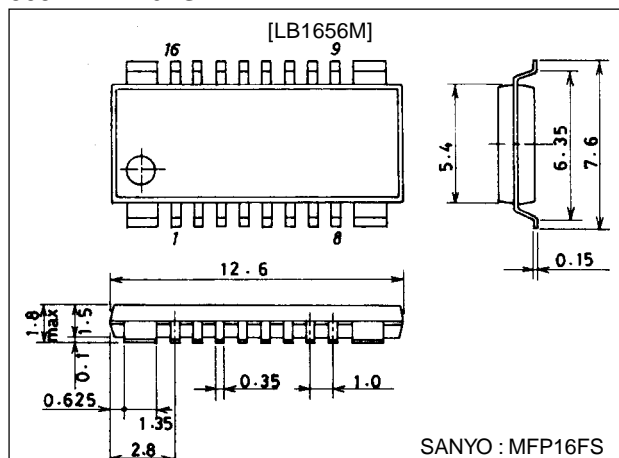
The maximum driver current×voltage is 0.33A×12V/bridge.

**Features**

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

**Package Dimensions**

unit:mm

**3097-MFP16FS****Specifications****Absolute Maximum Ratings at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings	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	$V_{IN}$		0 to $V_{CC}$	V
Peak seeking current	$I_{O\ peak}$	$t \leq 5ms$	500	mA
Continuous seeking current	$I_{OS}$		330	mA
Holding current	$I_{OH}$		200	mA
Allowable power dissipation	$P_d\ max$		0.9	W
Operating temperature	$T_{opr}$		-20 to 70	°C
Storage temperature	$T_{stg}$		-55 to +125	°C

**Allowable Operating Conditions at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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

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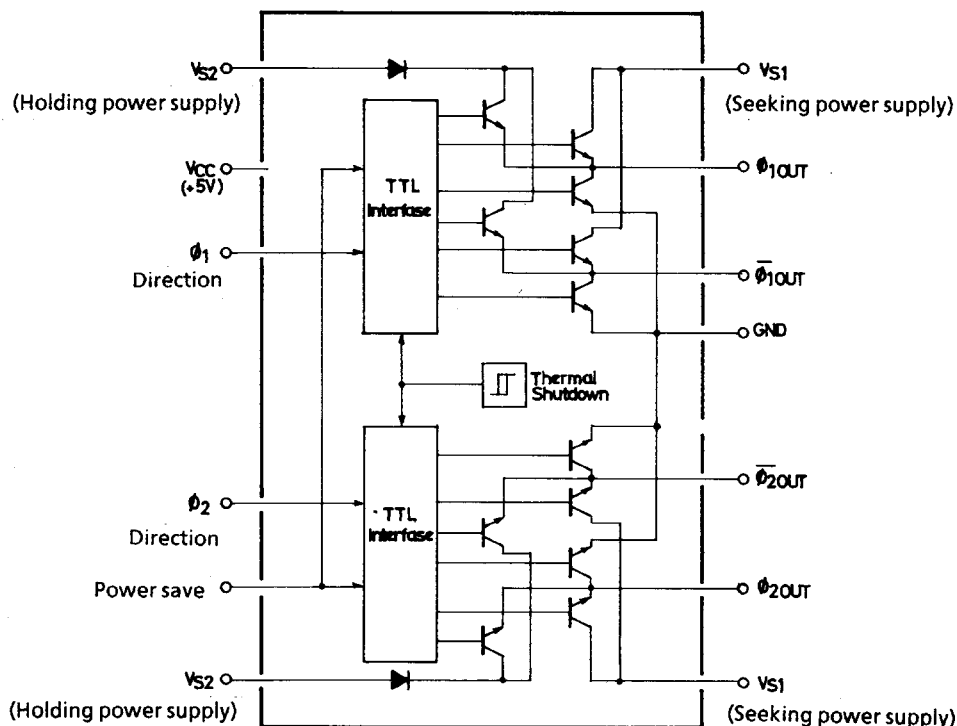
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

82098HA (KT)/1220TA, TS No.3321-1/4

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input low-level voltage	$V_{IL}$				0.8	V
Input high-level voltage	$V_{IH}$		2.0			V
Input low-level current	$I_{IL}$	$V_I=0.8V$	-10		+10	$\mu A$
Input high-level current	$I_{IH}$	$V_I=2V$		2	10	$\mu A$
		$V_I=5V$		0.3	1.0	mA
Current drain	$I_{CC}$	$PS=0.8V, V_{CC}$		25	33	mA
		$PS=0.8V, V_{S1}$ , Note1		6	10	mA
		$PS=0.8V, V_{S2}$ , Note2			0.1	mA
		$PS=2V, V_{CC}$		25	33	mA
		$PS=2V, V_{S1}$ , Note1		1	2	mA
		$PS=2V, V_{S2}$ , Note2		2.5	4	mA
Output transistor voltage	$V_{(BR)CER}$	$I_C=10mA$	18			V
$V_{S1}$ saturation voltage	$V_{CE(sat)1}$	$PS=0.8V, I_O=330mA$ , Note3		1.5	2.0	V
$V_{S2}$ saturation voltage	$V_{CE(sat)2}$	$PS=2.0V, I_O=130mA$ , Note3		1.5	2.0	V
Clamp voltage	$V_F$	$I_F=330mA$ , upper		3		V
		$I_F=330mA$ , lower		1.5		V
Delay time	$t_{PLH}$			4		$\mu s$
	$t_{PHL}$			2		$\mu s$
TSD operating temperature	TSD			150		$^{\circ}C$
TSD hysteresis	$\Delta T$			25		$^{\circ}C$

Note :

1. Measure sum of currents at pins 4 and 13.
2. Measure sum of currents at pins 5 and 12.
3. Measure sum of saturation voltages at upper and lower level.



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.



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