

SANYO**LB1674V****Brushless, Sensorless Motor Driver****Overview**

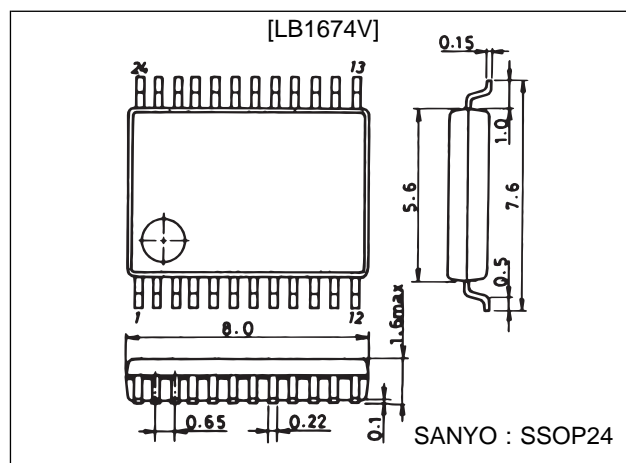
The LB1674V is a small motor driver ideal for mini-cassettes, headphone stereos and micro-cassettes.

Functions and Features

- 3-phase unipolar, brushless, sensorless motor driver
- Reverse function
- Built-in speed control function (V servo)
- Built-in reference voltage (0.5 V)
- Soft switching driver

Package Dimensions

unit : mm

3175A-SSOP24**Specifications****Absolute Maximum Ratings at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		5	V
Output transistor withstand voltage	V_{sus}		10	V
Maximum output current	$I_{m \text{ max}}$		0.6	A
Allowable power dissipation	$P_{d \text{ max}}$	$T_j = 125^\circ\text{C}$	0.4	W
Operating temperature	T_{opr}		0 to + 80	°C
Storage temperature	T_{stg}		-40 to + 125	°C

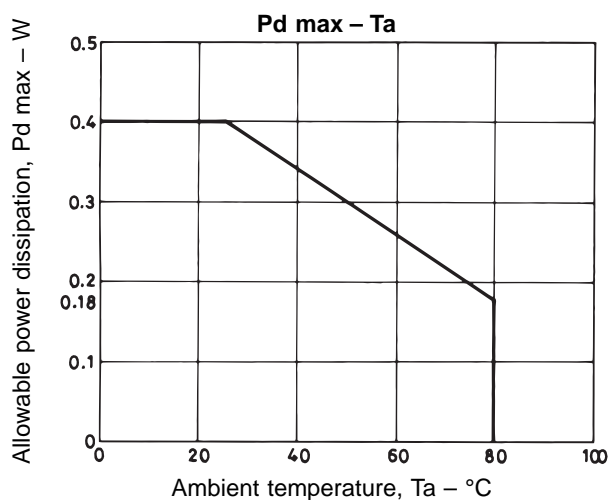
Allowable Operating Range at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		1.0 to 3.5	V

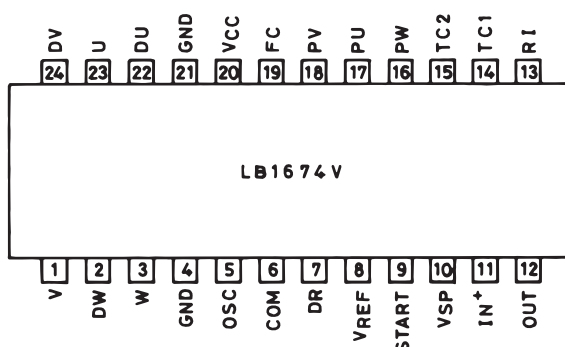
LB1674V

Electrical Characteristics at Ta = 25°C, VCC = 1.5 V, unless otherwise noted

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply current	I _{CC}	START pin: high		6.5	10	mA
		START pin: low		0	10	μA
Reference voltage	V _{ref}		0.47	0.50	0.53	V
Reference-voltage characteristic	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_{CC}$	V _{CC} = 1.0 to 3.5 V		1	1.5	%/V
Reference-voltage load characteristics	$\frac{\Delta V_{ref}}{\Delta I_{ref}}$	I _{ref} = 0 to -50 μA	-0.2	-0.06		mV/μA
Reference-voltage temperature characteristics	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_a$	T _a = 0 to 80°C		0.01		%/°C
Speed signal detection accuracy	V _{sp}	V _{IN} = 750 mV	140	155	170	mV
Speed signal interphase error			-5		+5	%
Speed-signal voltage characteristics	$\frac{\Delta V_{sp}}{V_{sp}} / \Delta V_{CC}$	V _{CC} = 1.0 to 3.5 V		2	3	%/V
Speed-signal temperature characteristics	$\frac{\Delta V_{sp}}{V_{sp}} / \Delta T_a$	V _{IN} = 0.75 V, T _a = 0 to 80°C		0.05		%/°C
Current detection accuracy	V _{RI}	V _{IN1} = 0.3 V, V _{IN2} = 1.0 V, R _I = 330 Ω	70	85	100	mV
Current detection ratio	K _I	V _{IN1} = 0.3 V, V _{IN2} = 1 to 1.3 V	0.17	0.22	0.27	
Starting pulse period	T _S	C _S = 0.1 μF		32		ms
COM _⊖ lead-in current	I _{COM_⊖}		25	35	45	μA
Output saturation voltage	V _{sat}	V _{CC} = 1.0 V, I _m = 0.3 A		0.15	0.25	V
Logic input high-level voltage	V _H		0.9			V
Logic input low-level voltage	V _L				0.3	V
TC pin lead-in current	I _{TC}		35	50	65	μA



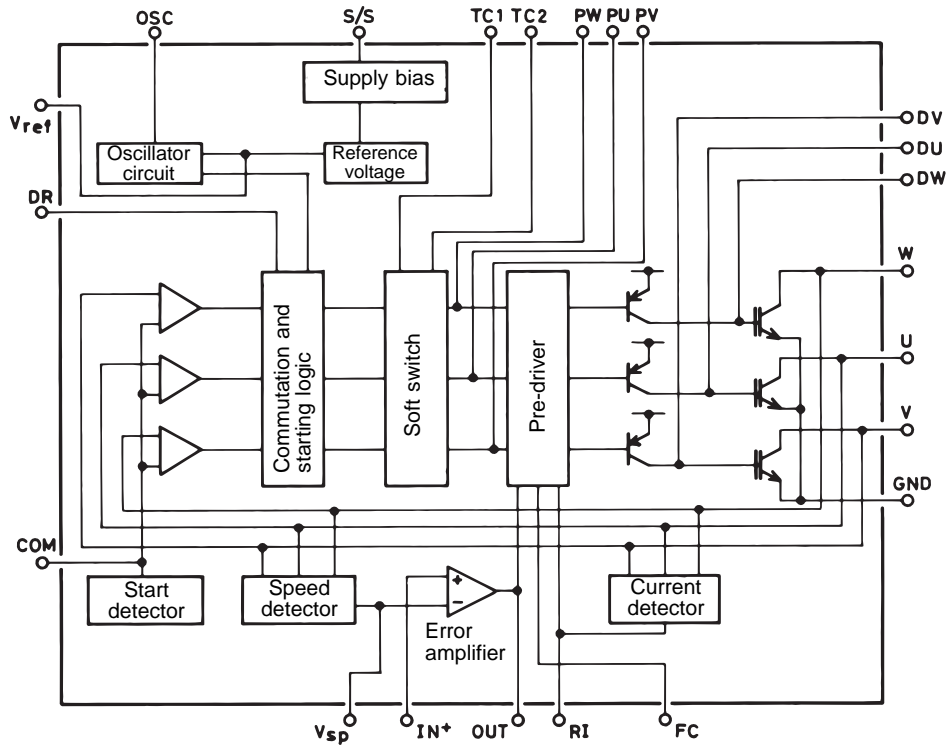
Pin Assignment



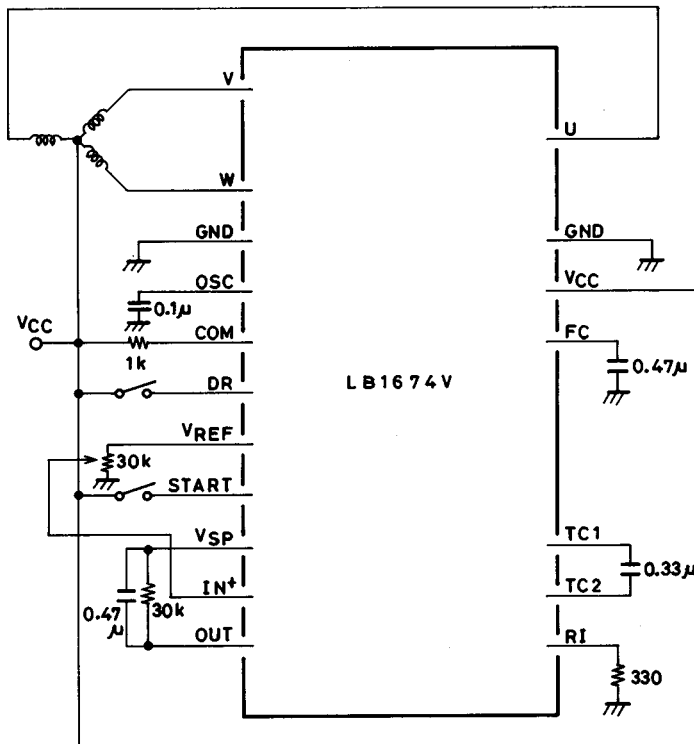
Top view

LB1674V

Equivalent Circuit Block Diagram



Sample Application Circuits at $V_{CC} = 1.5\text{ V}$



Note:
PU, PV and PW are internal
operation measurement pins.

Unit (resistance: Ω , capacitance: F)

LB1674V

Pin Description

Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent Circuit	Description
1 3 23	V W U		• Motor coil connection pins
2 22 24	DW DU DV		• Power transistor base pins
4	GND		• Power and signal ground
5	OSC		• Starting pulse period set pin
6	COM \ominus		• Start-up waveform detection circuit offset set pin
7	DR		• Drive direction switch pin (normally low)
8	Vref		• Reference voltage pin (0.5 V)
9	START		• Start/stop control pin. Active-high
10	Vsp		• Speed signal (motor induction voltage) detector

Continued on next page.

LB1674V

Continued from preceding page.

Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent circuit	Description
11	IN ⁺		<ul style="list-style-type: none"> Speed signal error amplifier reference input pin
12	OUT		<ul style="list-style-type: none"> Speed signal error amplifier output for motor current feedback
13	RI		<ul style="list-style-type: none"> Motor current detection pin
14	TC1		<ul style="list-style-type: none"> Motor current rising/falling time constant set pins
15	TC2		<ul style="list-style-type: none"> Motor current rising/falling time constant set pins
16 17 18	PW PU PV		<ul style="list-style-type: none"> Current waveform generator. Internal operation measurement pins. Must be left open.

Continued on next page.

LB1674V

Continued from preceding page.

Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent circuit	Description
19	FC		<ul style="list-style-type: none"> • Abnormal oscillation stop pin
20	V_{CC}		<ul style="list-style-type: none"> • Power supply
21	GND		<ul style="list-style-type: none"> • Power and signal ground

- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
 - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
 - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of August, 1996. Specifications and information herein are subject to change without notice.