

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

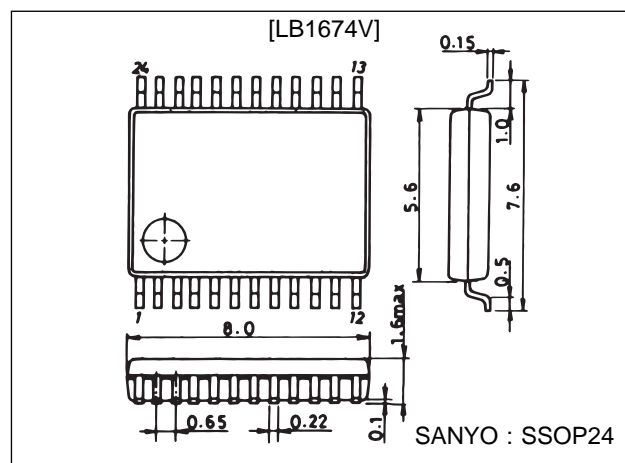
The LB1674V is a small motor driver ideal for mini-cassettes, headphone stereos and micro-cassettes.

**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

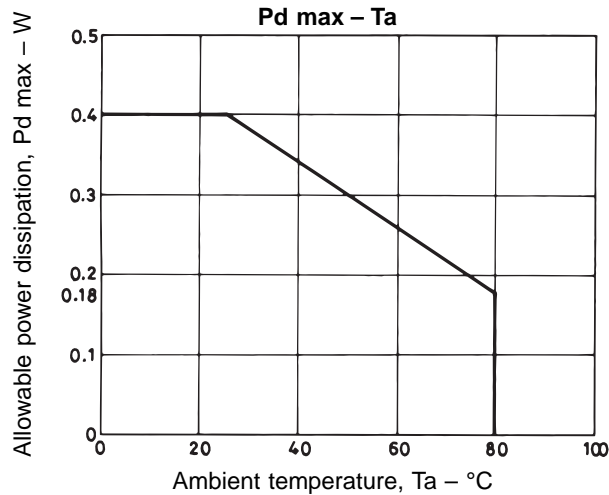
**Allowable Operating Range at Ta = 25°C**

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

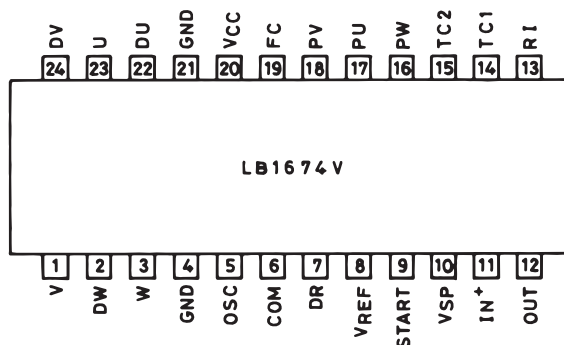
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### Electrical Characteristics at Ta = 25°C, VCC = 1.5 V, unless otherwise noted

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



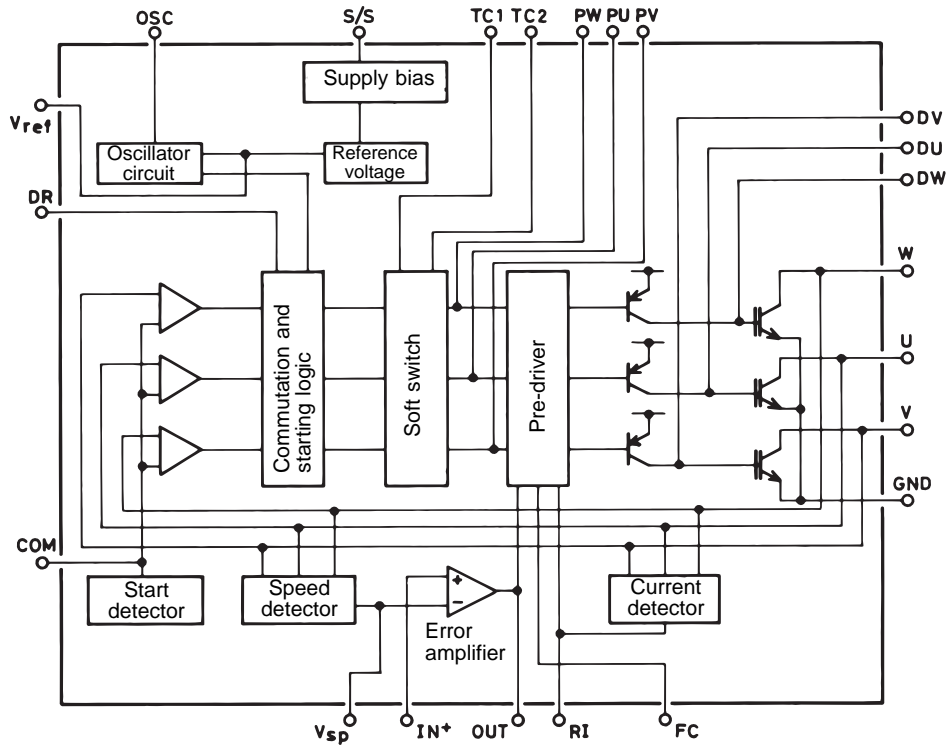
### Pin Assignment



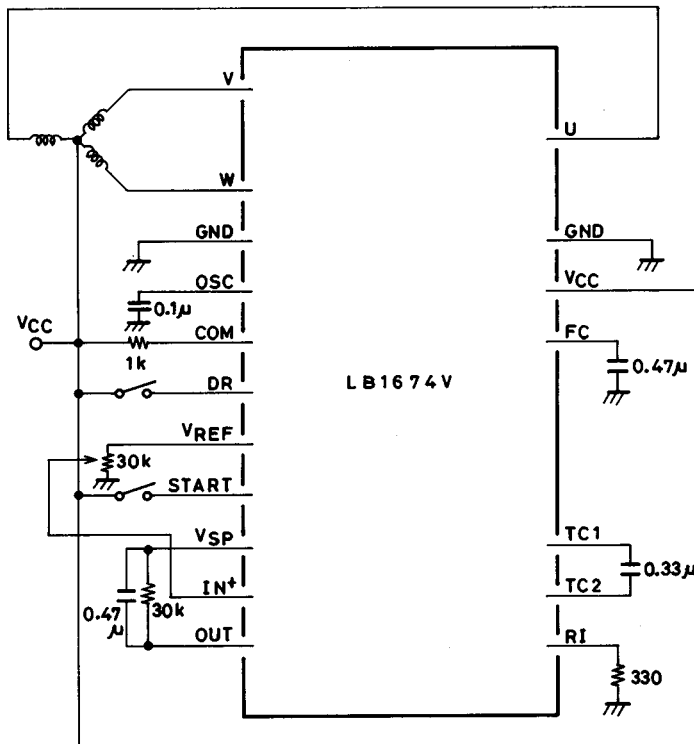
Top view

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## 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:  $\Omega$ , capacitance: F)

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## Pin Description

Unit (resistance:  $\Omega$ )

Pin Number	Pin Name	Equivalent Circuit	Description
1 3 23	V W U		<ul style="list-style-type: none"> <li>• Motor coil connection pins</li> </ul>
2 22 24	DW DU DV		<ul style="list-style-type: none"> <li>• Power transistor base pins</li> </ul>
4	GND		<ul style="list-style-type: none"> <li>• Power and signal ground</li> </ul>
5	OSC		<ul style="list-style-type: none"> <li>• Starting pulse period set pin</li> </ul>
6	COM $\ominus$		<ul style="list-style-type: none"> <li>• Start-up waveform detection circuit offset set pin</li> </ul>
7	DR		<ul style="list-style-type: none"> <li>• Drive direction switch pin (normally low)</li> </ul>
8	Vref		<ul style="list-style-type: none"> <li>• Reference voltage pin (0.5 V)</li> </ul>
9	START		<ul style="list-style-type: none"> <li>• Start/stop control pin. Active-high</li> </ul>
10	Vsp		<ul style="list-style-type: none"> <li>• Speed signal (motor induction voltage) detector</li> </ul>

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Unit (resistance:  $\Omega$ )

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

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Unit (resistance:  $\Omega$ )

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

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