

No. 4353

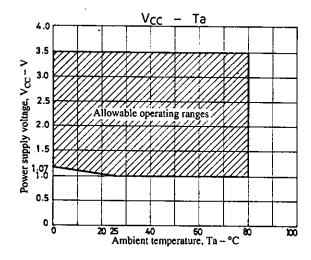
LB1672NM

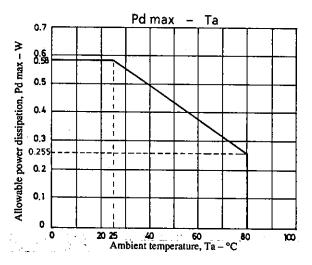
Brushless-Sensorless Motor Driver

The LB1672NM is ideal IC for stereo headphone, micro cassette and mini cassette players applications.

Functions and Features

- · Supports forward and reverse rotation
- On-chip speed control function (V-servo system)
- On-chip start/stop pin
- On-chip stabilized reference voltage (0.5 V)
- One on-chip comparator (NPN open collector output)
- Low voltage operation (1.0 V -)

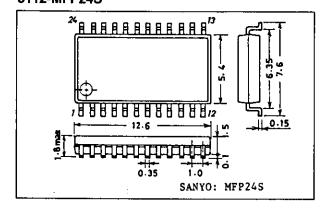




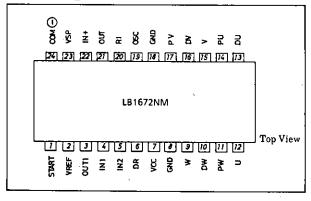
Package Dimensions

unit: mm

3112-MFP24S



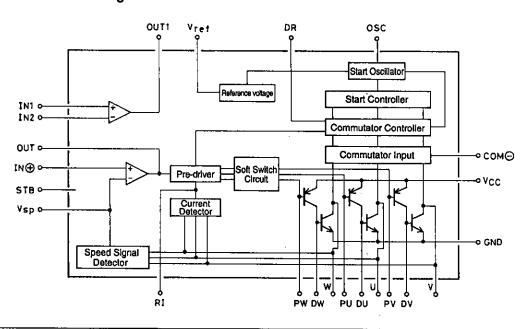
Pin Assignment



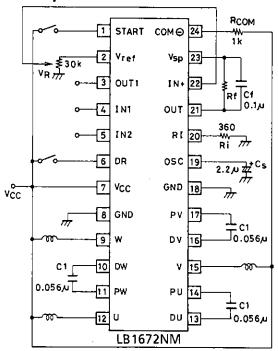
Specifications

Absolute Maximum Ratir	gs at Ta	= 25°C			unit		
Maximum supply voltage	V _{CC} max			5	V		
Output transistor pressure	V _{OTR} man	x		10	v		
Maximum output current	I _M max	•		1	Å		
Allowable power dissipation	Pd max			0.58	w		
Operating temperature	Topr	_	peratures other than 25°C are shown separate diagram	0 to +80	° C		
Storage temperature	Tstg		•	40 to +125	°C		
Allowable Operation Con	ditions a	t Ta = 25	°C		unit		
Power supply voltage operating range	V _{CC} op			1.0 to 3.5	v		
Electrical Characteristics	at Ta = 2	25°C, V _{CC}	= 1.5V, and the specified To	st Circuit			
			· · · · · · · · · · · · · · · · · · ·	min	typ	max	unit
Supply current		l _{CC} 1	START pin "H"	•	6	10	mA
		I _{CC} 2	START pin "L"		0	10	μA
Reference voltage		Vref		0.48	0.5	0.53	v
Reference voltage Voltage characteristics		$\frac{\triangle Vref}{\triangle Vref}/\triangle V$	$V_{\rm CC}$ $V_{\rm CC} = 1 \text{ to } 3.5 \text{V}$		1	1.5	%/V
Reference voltage Load characteristics		$\frac{\triangle Vref}{\triangle Iref}$	Iref = 0 to $-60 \mu A$	-0.1	-0.04		mV/μA
Reference voltage Temperature characteristics		$\frac{\triangle Vref}{Vref}/\triangle T$	Ta $Ta = 0$ to 80° C		0.01		%/°C
Speed signal Detection accuracy		Vsp	$V_{IN} = 500 \text{mV}$	125	135	145	mV
Speed signal Interphase error		-	<u>.</u> .	-5		5	%
Speed signal Voltage characteristics		$\frac{\triangle Vsp}{Vsp}/\triangle V$	V_{CC} $V_{CC} = 1 \text{ to } 3.5 \text{V}$		2	3	%/V
Speed signal Temperature characteristics		$\frac{\triangle V_{SP}}{V_{SP}}/\triangle T$	$V_{IN} = 0.5V$, $Ta = 0$ to $+80^{\circ}$ C		0.05		%/°C
Current detection accuracy		V_{RI}	$V_{IN1} = 0.3V, V_{IN2} = 1V$	100	120	137	mV
Current detection ratio		K _I	$V_{IN1} = 0.3V$, $V_{IN2} = 1$ to 1.3	V 0.17	0.2	0.23	
Start pulse period		T _S	$C_S = 2.2 \mu F$		55		ms
COM ⊕ lead-in current		I _{COM} ⊖		22	32	42	μА
Output saturation voltage		Vsat	$V_{CC} = 1V$, $I_{M} = 0.2A$		0.15	0.25	·v
Logic input "H"-level voltage		V_H		0.9			V
Logic input "L"-level voltage		v <u>"</u>				0.3	v
Comparator offset voltage		V _{OFF}		-10	0	10	mV
Comparator output current			$V_{CC} = 1V$, OUT1 = V_{CC}	100			μА

Equivalent Circuit Block Diagram



Application Circuits Example



- When the resistance value of RI increases and the capacitance between V_{CC} and GND is large (1500μF), oscillation elevates to the motor waveform.
- When the resistance value of RI is excessively low, start voltage increases.
- The damping capacitor (C₁) for the output circuit should be as small as possible with C_S as large as possible.
- When the capacitor for the output circuit is large and C_S is small, start voltage increases with low temperatures.

Unit (resistance: Ω , capacitance: F)

Pin Descriptions

Pin Number	Pin Name	Functions			
1	START	This pin is "H" active.			
2	Vref	This pin is for reference voltage (0.5 V).			
3	OUT1	This pin is for the on-chip comparator output (NPN open comparator).			
4	IN1	This pin is for the on-chip comparator negative input (PNP base input).			
5	IN2	This pin is for the on-chip comparator positive input (PNP base input).			
6	DR	This pin is for switching rotation direction ("H" Initiates forward rotation)			
7	V _{cc}	This pin is for the power supply.			
8	GND	This pin is for all circuit grounds.			
9	W	This pin is for W-phase output.			
10	DW	This pin is for the W-phase output transistor base.			
11	PW	This pin is for the W-phase output predrive transistor base.			
12	U	This pin is for the U-phase output.			
13	DŲ	This pin is for the U-phase output transistor base.			
14	PU	This pin is for the U-phase output predrive transistor base.			
15	V	This pin is for the V-phase output.			
16	DV	This pin is for the V-phase output transistor base.			
17	PV	This pin is for the V-phase output predrive transistor base.			
18	GND	This pin is the common for pln (a) which is the pin for all circuit grounds.			
19	osc	This pin is for start pulse period setting.			
20	RI	This pin is for use in detecting motor current.			
21	OUT	This pin is for speed signal error amplifier output. Motor current is returned.			
22	IN to	This pin is for speed signal error amplifier standard input,			
23	Vsp	This pin is for detecting the speed signal (voltage induction).			
24	COM e	This pin performs a supporting role for the current control circuit during startup or when the rotatio direction is changed.			

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