

LB1624M



3073A

Monolithic Digital IC

T-52-13-25

3-Phase DD Motor Driver

©2634

The LB1624M is a 3-phase DD motor driver IC particularly designed for low voltage use and ideally suited for use in VTR capstan motor drive, drum motor drive, and floppy disk motor drive applications.

Features and Functions

- . Designed for 5V-powered control system
- . Voltage-controlled system/current-controlled system available
- . Speed control available
- . Forward/reverse control available
- . 20V/1.5A rating
- . MFP package suited for surface mounting

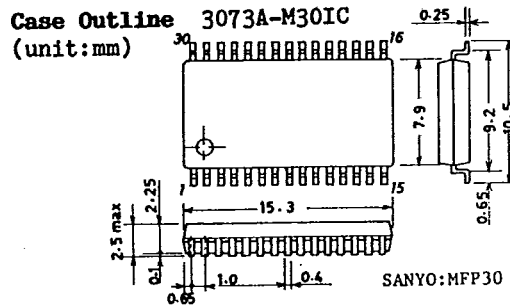
Absolute Maximum Ratings at Ta=25°C			unit
Maximum Supply Voltage	V _{CC1}	22	V
	V _{CC2}	7	V
Output Current	I _{OUT}	1.5	A
Allowable Power Dissipation	P _{d max}	0.9	W
Operating Temperature	T _{opg}	-20 to +75	°C
Storage Temperature	T _{stg}	-55 to +125	°C

Allowable Operating Conditions at Ta=25°C			unit
Supply Voltage	V _{CC1}	7.0 to 20	V
	V _{CC2}	4.3 to 6.3	V

Electrical Characteristics at Ta=25°C, V _{CC1} =12V, V _{CC2} =5.0V				min	typ	max	unit
Supply Voltage	I _{CC(off)}	V _C =0V, I _{CC1} +I _{CC2}		13	18		mA
	I _{CC(dri)}	V _C =4V, I _{CC2}		20	40		mA
Output Saturation Voltage	V _{o(sat)1}	I _{out} =0.58A sink+source		1.4	2.1		V
	V _{o(sat)2}	I _{out} =1A sink+source		2.0	3.5		V
Common-Mode Input Voltage Range			1.3	V _{CC2} -1.3			V
Motor Forward Rotation			2.0	V _{CC2}			V
Motor Reverse Rotation			0	0.3			V
Interphase Current Variation	Driver stage		-25	0	+25		%
	Output stage		-25	0	+25		%



Continued on next page.



8217TA, TS No.2634-1/4

LB1624M

T-52-13-25

Continued from preceding page.

		min	typ	max	unit
Speed Control Voltage (OFF)	V_{C1} $R_f=0, R_s=0,$ FC pin \rightarrow GND current 5uA			2.1	V
(ON)	V_{C2} $R_f=0, R_s=0,$ FC pin \rightarrow GND current 0.5mA	2.38		2.58	V
Closed-Loop Voltage Gain	V_{C3} $R_f=1\text{ohm}, V_{Rf}=100\text{mA}$			2.7	V
Input Sensitivity	$R_f=1\text{ohm}, R_s=100\text{ohms}, I_L=100\text{mA}$ Hall input	0.44			A/V
			20		mVpeak

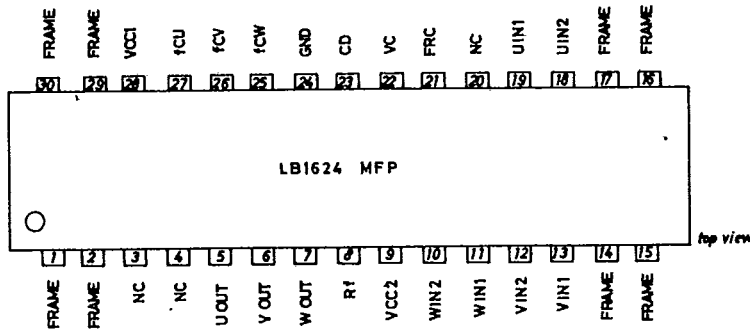
Pin Description

Pin Name	Pin No.	Function
U_{IN1}, U_{IN2}	19, 18	U phase hall element input pin. 'H' of logic: $V_{IN1} > V_{IN2}$
V_{IN1}, V_{IN2}	13, 12	V phase hall element input pin. 'H' of logic: $V_{IN1} > V_{IN2}$
W_{IN1}, W_{IN2}	11, 10	W phase hall element input pin. 'H' of logic: $V_{IN1} > V_{IN2}$
U_{OUT}	5	U phase output pin.
V_{OUT}	6	V phase output pin.
W_{OUT}	7	W phase output pin.
V_{CC1}	28	Power supply pin for applying output.
V_{CC2}	9	Power supply pin for applying voltage to each section other than output section. The control point of control voltage is at approximately 1/2 of this voltage. This voltage must be stabilized to be free from ripple, noise, etc.
R_f	8	Output current detect pin. By connecting R_f across this pin and GND pin, output current is detected as voltage.
C_D	23	Pin for fetching current (voltage) detected with R_f . By connecting a resistor across C_D pin and R_f pin, speed control start voltage can be fine-adjusted.
f_{CU}	27	Frequency characteristic compensation pin.
f_{CV}	26	Closed-loop oscillation in current-controlled system (including motor, F-V converter) is stopped.
f_{CW}	25	
V_C	22	Speed/phase control pin. Control starts at approximately 1/2 of V_{CC2} . Control is of current-controlled type that controls output current. For $R_f=1\text{ohm}$, LB1624 closed-loop has $g_m=0.44\text{A/V}$ typ, which can be adjusted by varying R_f .
GND	24	GND for other than output. Minimum potential of output transistor is at R_f pin.
FRC	21	Forward/reverse control pin. By setting this pin to 'H'(more than 1.5V)/'L'(less than 0.3V), truth value is changed to perform forward/reverse rotation.

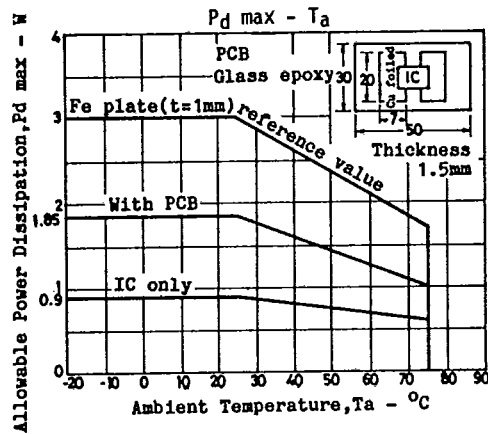
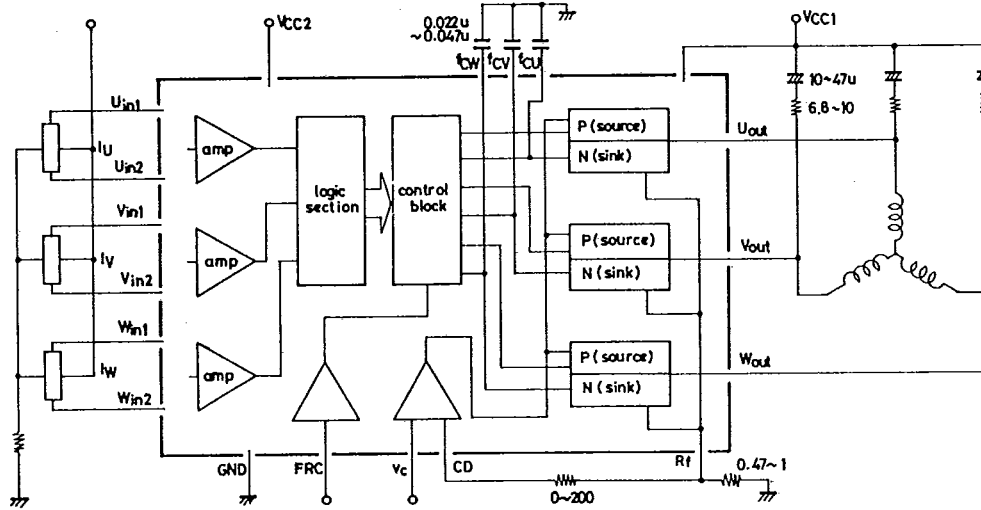
LB1624M

T-52-13-25

Pin Assignment



Equivalent Circuit Block Diagram and Peripheral Circuit



LB1624M

T-52-13-25

Truth Table

	Source	Sink	Input			Forward/Reverse Control F/RC
			U	V	W	
1	W phase	→V phase	H	H	L	L
	V phase	→W phase				H
2	W phase	→U phase	H	L	L	L
	U phase	→W phase				H
3	V phase	→W phase	L	L	H	L
	W phase	→V phase				H
4	U phase	→V phase	L	H	L	L
	V phase	→U phase				H
5	V phase	→U phase	H	L	H	L
	U phase	→V phase				H
6	U phase	→W phase	L	H	H	L
	W phase	→U phase				H

Input 'H': Each phase input 1 is more than 0.2V higher than each phase input 2.

'L': Each phase input 1 is more than 0.2V lower than each phase input 2.

Forward/reverse control: 'H': 2.0 to V_{CC2}

'L': 0 to 0.3V