

FAN8024BD

4-Channel Motor Driver

Features

- 2-Channel BTL driver with current feedback
- 2-Channel BTL DC motor driver
- Built-in thermal shutdown circuit
- Built-in mute circuit
- Operating supply voltage: 4.5~13.2V

Description

The FAN8024BD is a monolithic IC, suitable for 2-ch BTL DC motor drivers and 2-ch motor drivers with current feedback which drive the focus and tracking actuators of a CD- media system.



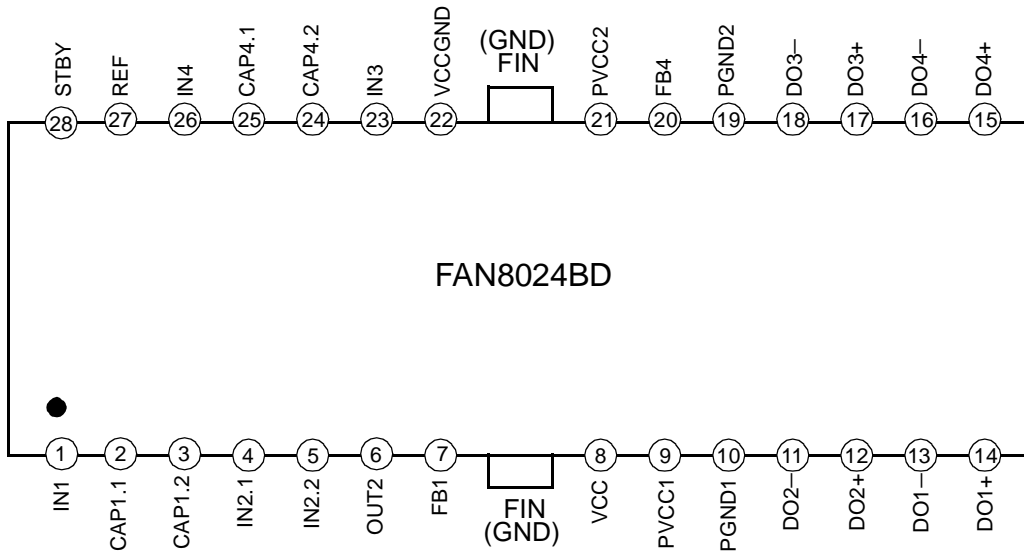
Typical Applications

- Compact disk ROM (CD-ROM)
- Compact disk RW (CD-RW)
- Digital video disk ROM (DVD-ROM)
- Digital video disk RAM (DVD-RAM)
- Digital video disk player (DVDP)
- Other compact disk media

Ordering Information

Device	Package	Operating Temp.
FAN8024BD	28-SSOPH-375	-25 °C ~ 85 °C
FAN8024BDTF	28-SSOPH-375	-25 °C ~ 85 °C

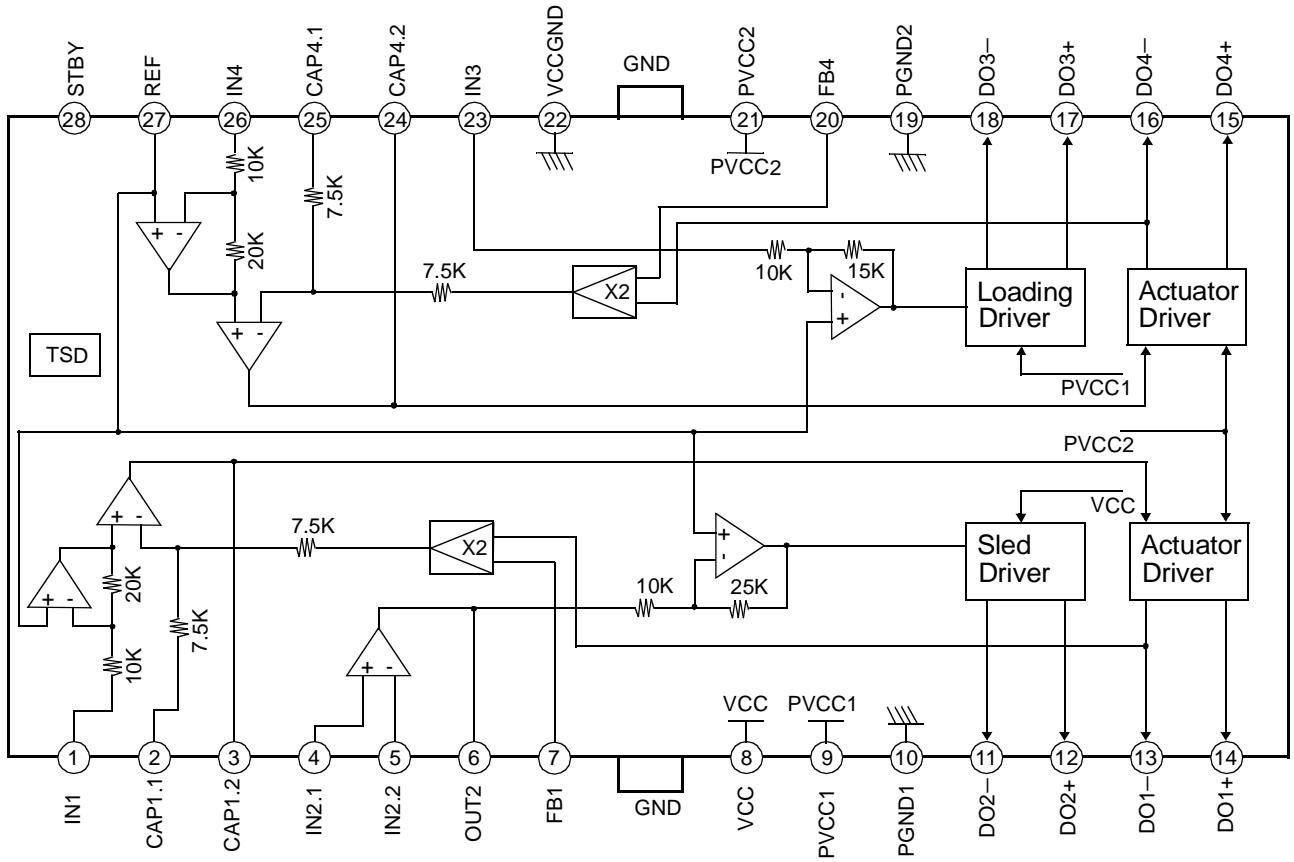
Pin Assignments



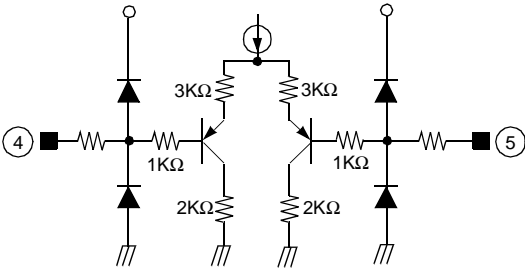
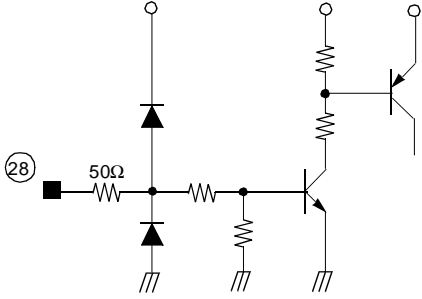
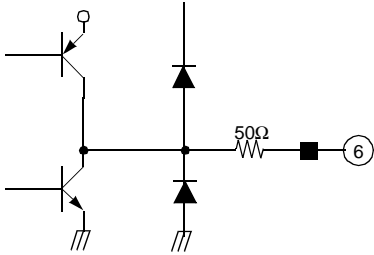
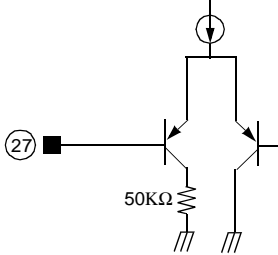
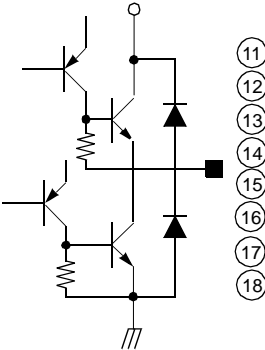
Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	IN1	I	CH1 input
2	CAP1.1	-	Connection with capacitor for CH1
3	CAP1.2	-	
4	IN2.1	I	OP-AMP CH2 input(+)
5	IN2.2	I	OP-AMP CH2 input(-)
6	OUT2	O	OP-AMP CH2 output
7	FB1	I	Feedback for CH1
8	VCC	-	Signal Vcc
9	PVCC1	-	Power Supply 1
10	PGND1	-	Power Ground 1
11	DO2-	O	Drive2 Output (-)
12	DO2+	O	Drive2 Output (+)
13	DO1-	O	Drive1 Output (-)
14	DO1+	O	Drive1 Output (+)
15	DO4+	O	Drive4 Output (+)
16	DO4-	O	Drive4 Output (-)
17	DO3+	O	Drive3 Output (+)
18	DO3-	O	Drive3 Output (-)
19	PGND2	-	Power Ground 2
20	FB4	-	Feedback for CH4
21	PVCC2	-	Power Supply 2
22	VCCGND	-	Vcc ground
23	IN3	I	CH3 input
24	CAP4.2	-	Connection with capacitor for CH4
25	CAP4.1	-	
26	IN4	I	CH4 input
27	REF	I	Bias voltage input
28	STBY	I	Stand-by input

Internal Block Diagram



Equivalent Circuits

ERROR AMP INPUT	STAND-BY INPUT
	
ERROR AMP OUTPUT	SIGNAL REFERENCE INPUT
	
POWER AMP OUTPUT	
	

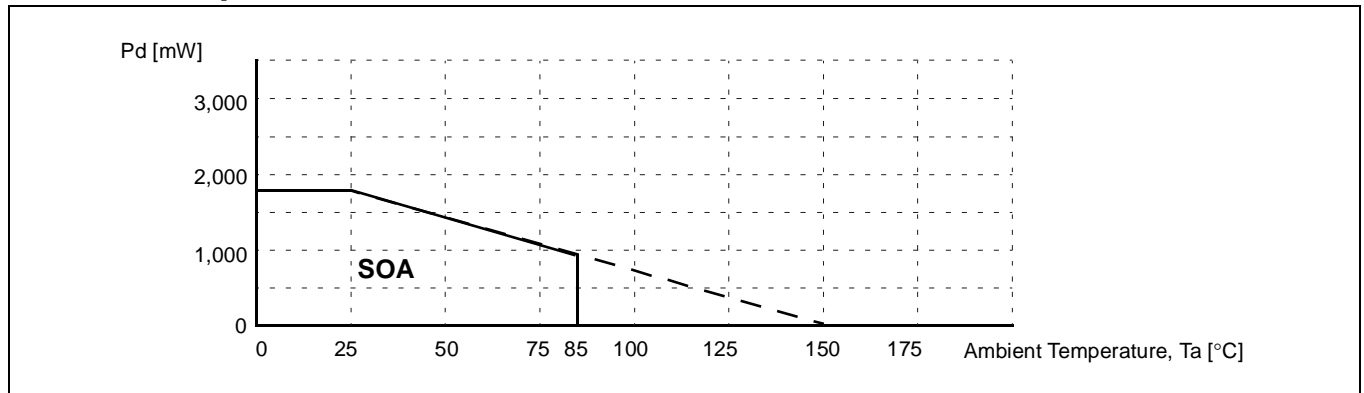
Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit
Maximum supply voltage	V _{CCmax}	15	V
Power dissipation	P _D	1.7 ^{note}	W
Operating temperature range	T _{OPR}	-25 ~ +85	°C
Storage temperature range	T _{STG}	-55 ~ +150	°C

NOTE:

1. When mounted on a 50mm × 50mm × 1mm PCB (Phenolic resin material).
2. Power dissipation is reduced by -13.6mW/°C above Ta = 25°C
3. Should not exceed Pd(Power dissipation) and SOA(Safe operating area).

Power Dissipation Curve



Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V _{CC}	4.5	-	13.2	V
Supply Voltage	PV _{CC1} , PV _{CC2}	-	V _{CC}	-	V

Electrical Characteristics

(Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$, $V_{CC} = 12\text{V}$, $PV_{CC1,2} = 5\text{V}$)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescent Current1	I_{CC1}	Stand-by off	-	18	27	mA
Quiescent Current1	I_{CC2}	Stand-by on	-	-	0.5	mA
Stand-by On Voltage	V_{STon}	-	-	-	0.5	V
Stand-by Off Voltage	V_{SToff}	-	2.0	-	-	V
ACTUATOR DRIVE CIRCUIT						
Output Offset Current	$I_{OO1,4}$	-	-6	0	+6	mA
Maximum Output Voltage1	$V_{OM1,4}$	-	3.6	4.0	-	V
Transconductance	$G_{M1,4}$	$V_{IN} = 100\text{mVp-p}$, $f=1\text{kHz}$	1.5	1.7	1.9	A/V
PRE OP AMP (SLED DRIVER)						
Common mode Input Range*	V_{OOM}	-	0	-	11.0	V
Input Bias Current	I_B	-	-300	-30	-	nA
Low Level Output Voltage	V_{OL}	-	-	0.1	0.3	V
High Level Output Voltage	V_{OH}	-	10	10.9	-	V
Output Source Current	I_{SOURCE}	-	1	4	-	mA
Output Sink Current	I_{SINK}	-	5	10	-	mA
SLED DRIVE CIRCUIT						
Output Offset voltage2	V_{OF2}	-	-100	0	+100	mV
Maximum Output Voltage2	V_{OM2}	-	10.0	10.9	-	V
Closed loop Voltage Gain1	G_{VLO2}	$V_{IN} = 100\text{mVp-p}$, $f=1\text{kHz}$	18.0	20.0	22.0	dB
Loading DRIVE CIRCUIT						
Output Offset Voltage1	V_{OF3}	-	-50	0	50	mV
Maximum Output Voltage 3	V_{OM3}	-	3.6	4.0	-	V
Closed loop Voltage Gain 2	G_{VLO3}	$V_{IN} = 100\text{mVp-p}$, $f=1\text{KHz}$	13.5	15.5	17.5	dB

* : Guaranteed design value

Application Information

1. Reference Input & Stand-by Function

- Reference input (PIN 27)
The applied voltage at the reference input pin must be between 0.8V and 6.5V, when $V_{CC}=8.5V$.
- Stand-by input (PIN 28)
The following input conditions must be satisfied for the normal stand-by function.

Stand-by input voltage	Below 0.5V or OPEN	Stand-by function is activated so the bias block and the power block are disabled
Stand-by input voltage	Above 2.0V	Normal operation

2. Protection Function

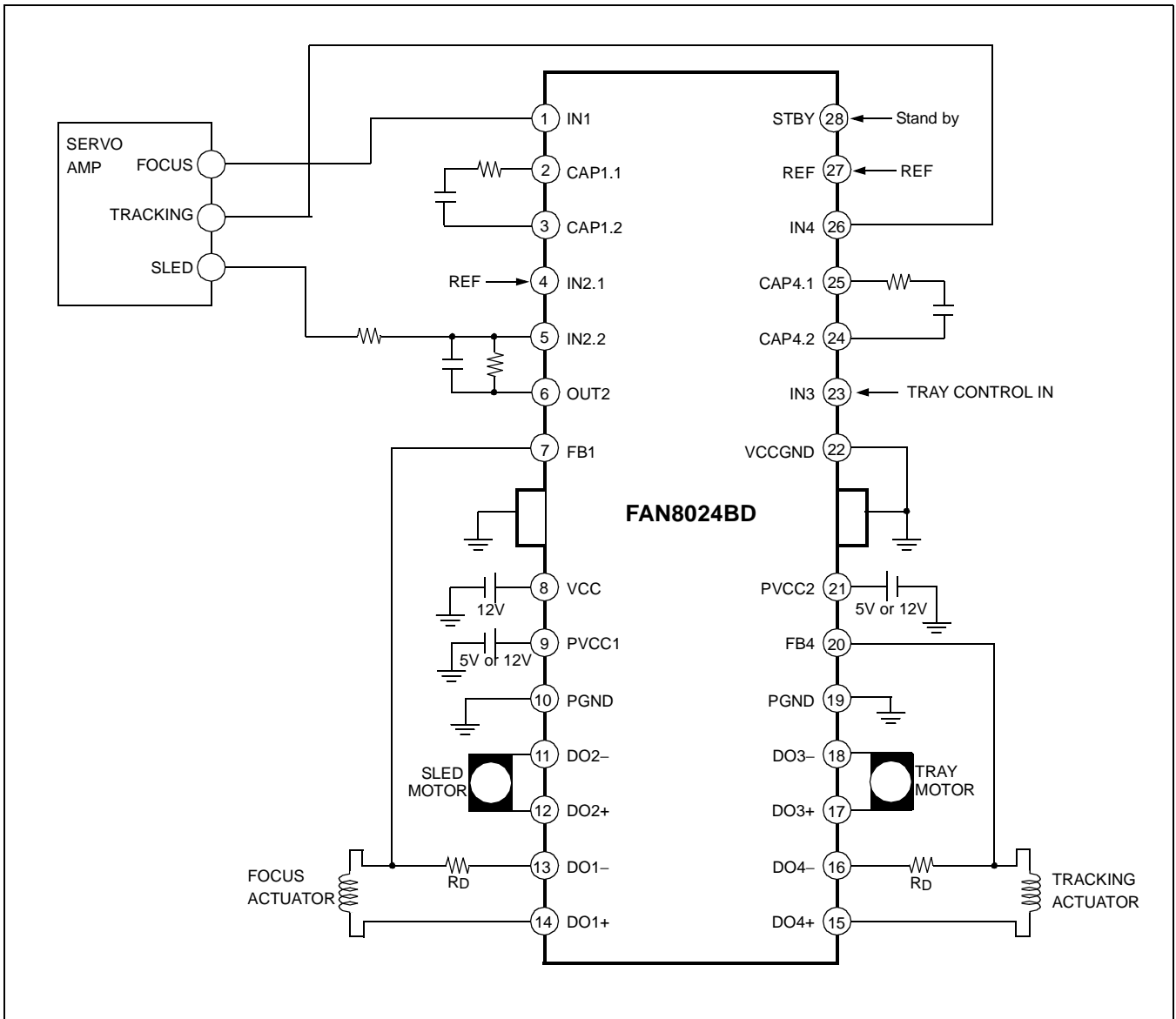
Thermal shutdown (TSD)

If the chip temperature rises above 175°C, the thermal shutdown (TSD) circuit is activated and the output circuit is in the mute state, that is off state. The TSD circuit has a temperature hysteresis of 25°C

3. Separation Of Power Supply

- PV_{CC1} (PIN 9)
 PV_{CC1} is the power supply for loading driver. The range is between 5V ~ 12V.
- PV_{CC2} (PIN 21)
 PV_{CC2} is the power supply for actuator drivers that include focus and tracking actuators. The range is between 5V ~ 12V
- V_{CC} (PIN 8)
 V_{CC} pin supplies power for sled driver and signal logic part. The voltage applied to V_{CC} must be higher than PV_{cc1} and PV_{CC2} at least 1V

Typical Application Circuits



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