

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.



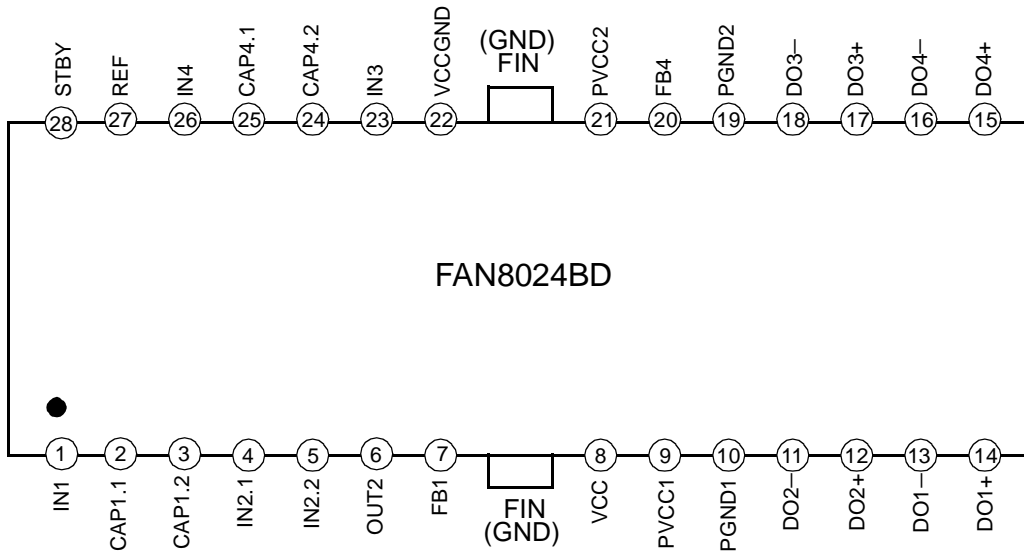
Typical Applications

- 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

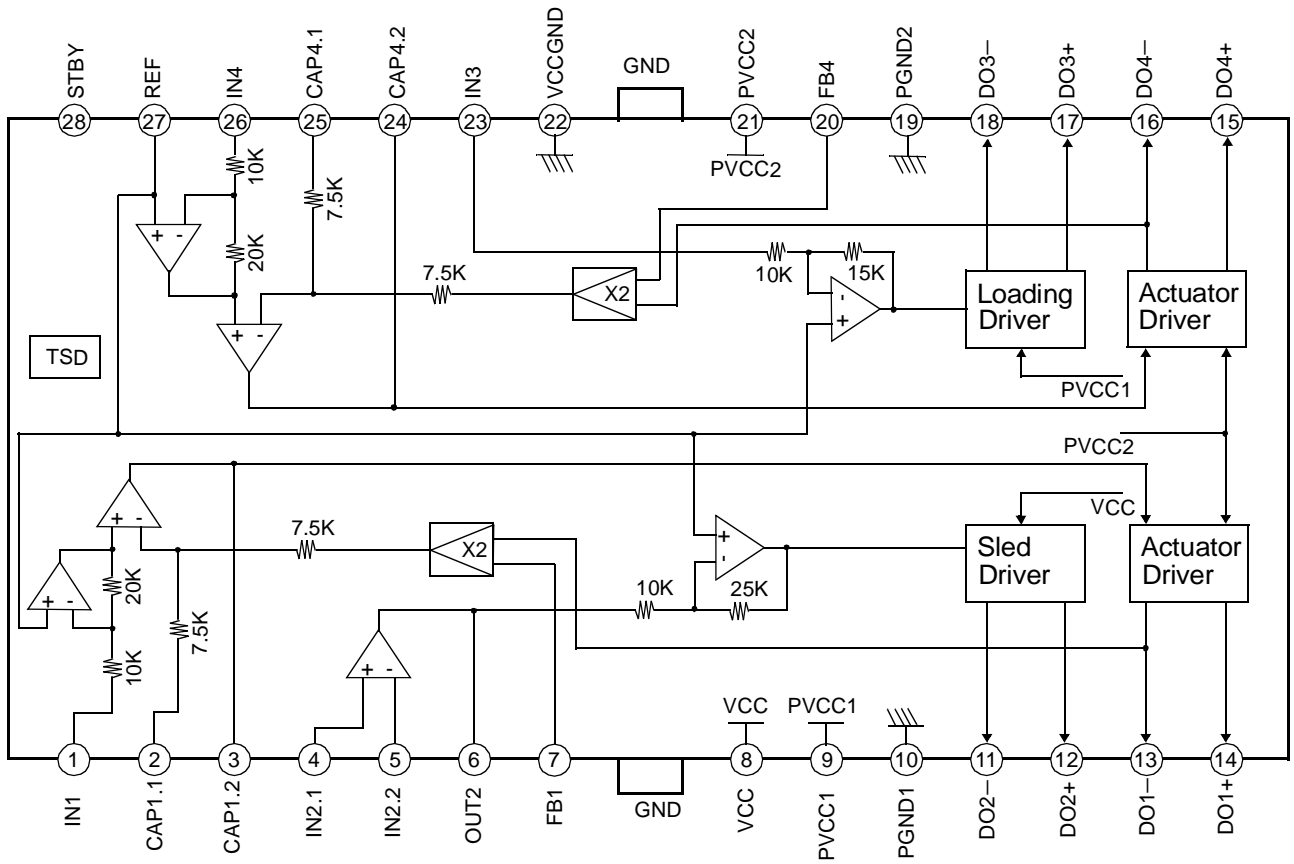
Pin Assignments



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	

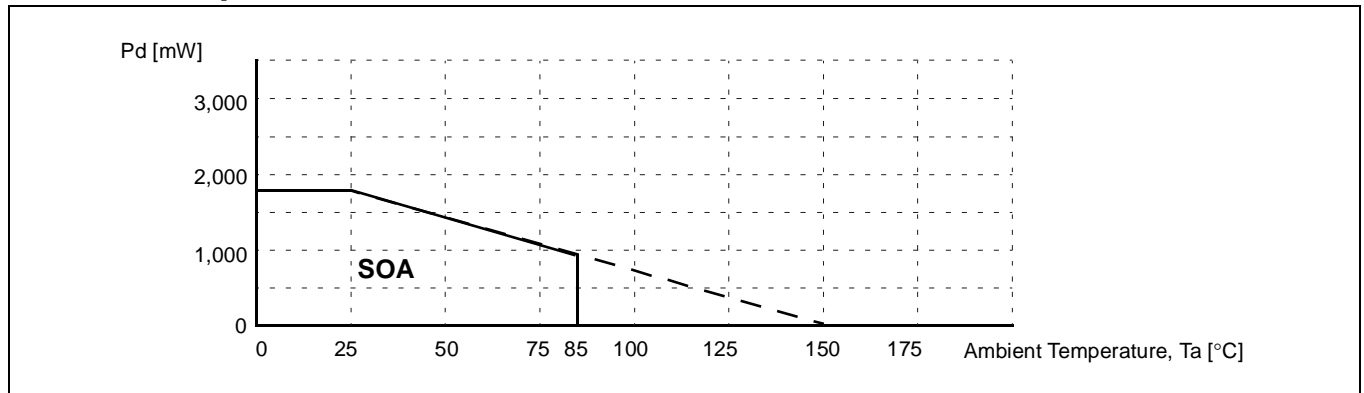
Absolute Maximum Ratings (Ta = 25°C)

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

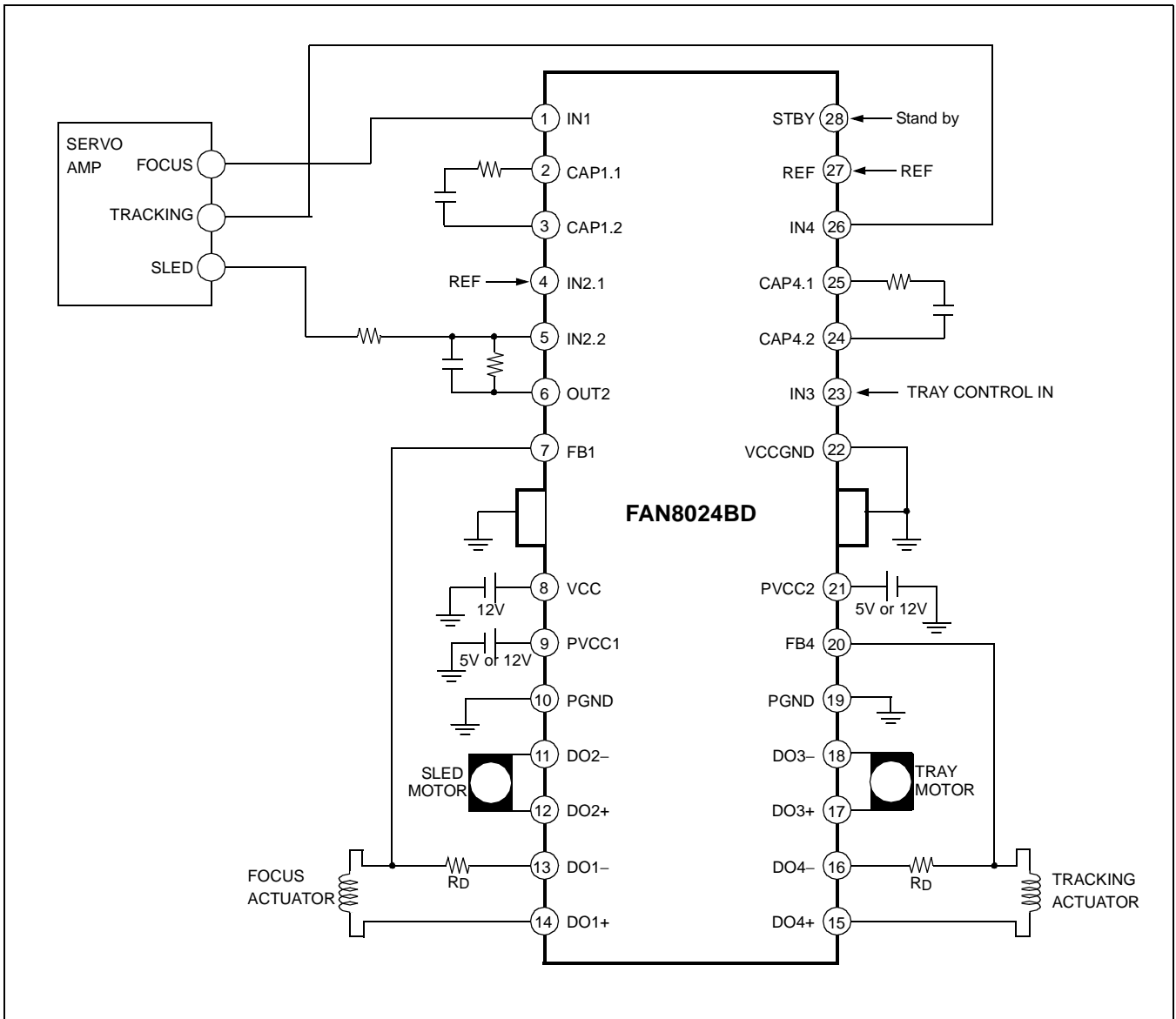
Thermal shutdown (TSD)

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



DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.