

# DATA SHEET

Part No.	AN41251A
Package Code No.	HQFP048-P-0707A

Maintenance/Discontinued includes following lifecycle stage.  
planned maintenance type  
maintenance type  
planned discontinued type  
discontinued type  
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Maintenance/Discontinued includes four Product lifecycle stage.  
Discontinued  
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# AN41251A

## Optical disc motor drive IC

### ■ Overview

AN41251A, an optical disk motor drive IC, is a single chip IC incorporating a 6-ch. PWM (Pulse Width Modulation) driver using low noise Direct PWM in its spindle motor driver.

It is effective for reducing noise, vibration and power consumption of laptop computers.

### ■ Features

- 1 sensor, 3-phase full-wave and low-noise Direct PWM driving for Spindle Motor driver.
- Dead Zone Less, Linear input – Direct PWM driving for actuator (Focus, Tracking, Tilt)
- Sense resistor-less, peak current sense feedback, Linear input – Direct PWM driving for Stepping motor driver
- Linear input – Direct PWM driving for only loading driver
- Independent power supply pins: Independent power supply pins are provided for each of the spindle, actuator, and stepping motor.
- Compact Package: Less area 9.0 mm (Pins included), Slim package 1.0 mm  
High power dissipation: On standard board (one side): 1.348 W (Glass-Epoxy 50 mm × 50 mm × 0.8 mm)
- Functions: Spindle motor driver  
Actuator (Focus, Tracking, Tilt) driver  
Stepping Motor driver  
Loading Motor driver
- Drive voltage: 5 V
- Additional features: Short brake / Reverse brake /Auto brake switching  
Spindle motor drive gain switch  
1 time / 3 times FG output  
Standby mode switch  
Output reset function at  $V_{REF}$  down.  
Thermal shutdown circuit

### ■ Applications

- For CD and DVD player

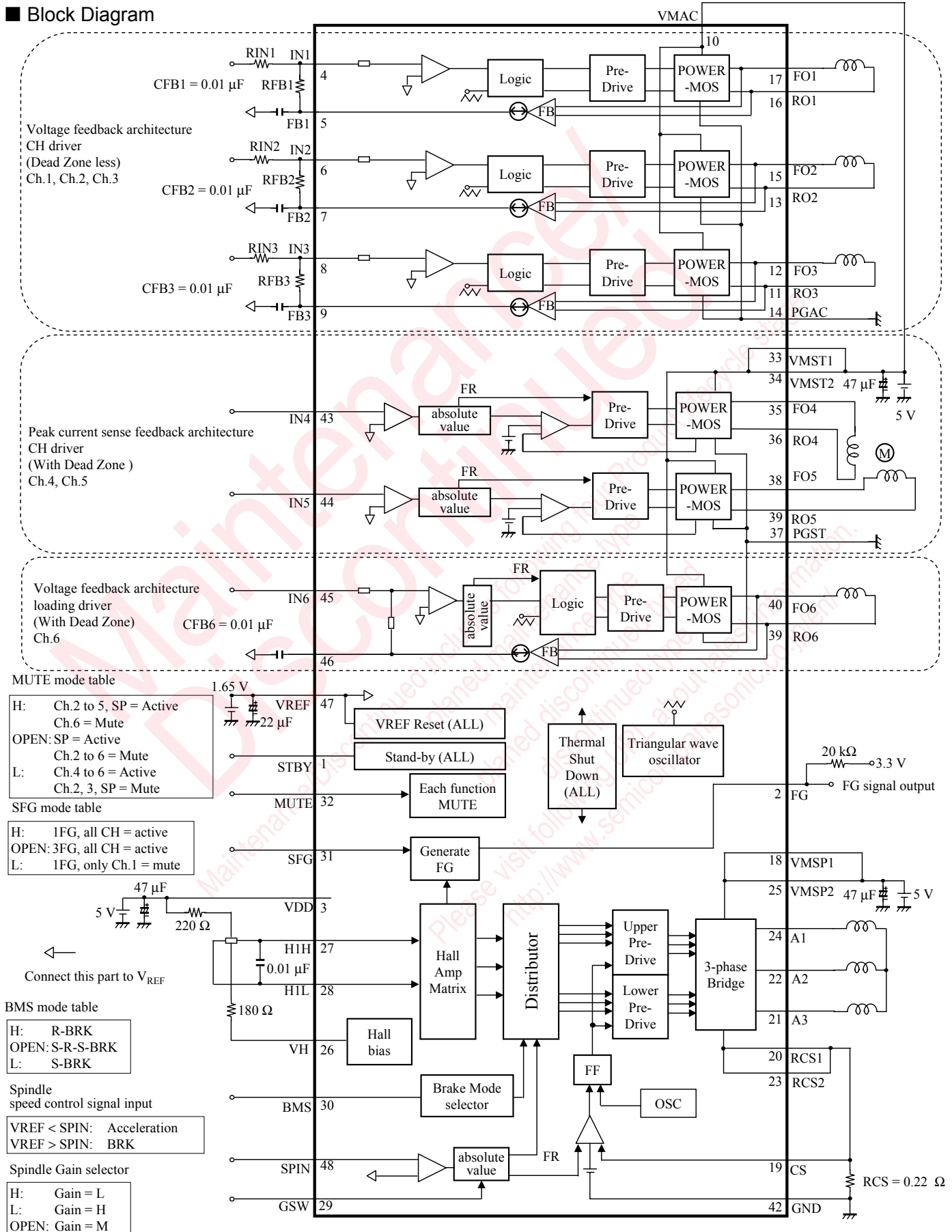
### ■ Package

- 48-pin plastic quad flat package with heat slug (QFP type)

### ■ Type

- Silicon monolithic bipolar IC

■ Block Diagram



**MUTE mode table**

H:	Ch.2 to 5, SP = Active Ch.6 = Mute
OPEN:	SP = Active Ch.2 to 6 = Mute
L:	Ch.4 to 6 = Active Ch.2, 3, SP = Mute

**SFG mode table**

H:	1FG, all CH = active
OPEN:	3FG, all CH = active
L:	1FG, only Ch.1 = mute

**BMS mode table**

H:	R-BRK
OPEN:	S-R-S-BRK
L:	S-BRK

**Spindle speed control signal input**

VREF < SPIN: Acceleration  
VREF > SPIN: BRK

**Spindle Gain selector**

H:	Gain = L
L:	Gain = H
OPEN:	Gain = M

## ■ Pin Descriptions

Pin No.	Pin name	Type	Description
1	STBY	Input	Total shutdown input
2	FG	Output	Spindle motor drive FG signal output (O.D. output)
3	VDD	Power supply	Control circuit power supply
4	IN1	Input	Ch.1 control signal input
5	FB1	Output	Ch.1 feedback output
6	IN2	Input	Ch.2 control signal input
7	FB2	Output	Ch.2 feedback output
8	IN3	Input	Ch.3 control signal input
9	FB3	Output	Ch.3 feedback output
10	VMAC	Power supply	Ch.1, Ch.2, Ch.3 Coil Drive power
11	RO3	Output	Ch.3 inverting output
12	FO3	Output	Ch.3 non-inverting output
13	RO2	Output	Ch.2 inverting output
14	PGAC	Ground	Ch.1, Ch.2, Ch.3 Coil Drive GND
15	FO2	Output	Ch.2 non-inverting output
16	RO1	Output	Ch.1 inverting output
17	FO1	Output	Ch.1 non-inverting output
18	VMSP1	Power supply	Spindle motor drive power supply
19	CS	Input	Spindle motor drive output current detection
20	RCS1	Output	Spindle motor drive common source output1
21	A3	Output	Spindle motor drive output3
22	A2	Output	Spindle motor drive output2
23	RCS2	Output	Spindle motor drive common source output2
24	A1	Output	Spindle motor drive output1
25	VMSP2	Power supply	Spindle motor drive power supply
26	4VH	Output	Spindle motor drive Hall bias output
27	H1H	Input	Spindle motor drive Hall element positive input
28	H1L	Input	Spindle motor drive Hall element negative input
29	GSW	Input	Spindle motor drive gain switching input
30	BMS	Input	Spindle motor drive Brake mode switching input
31	SFG	Input	Spindle motor drive FG mode switching input
32	MUTE	Input	MUTE pin
33	VMST1	Power supply	Ch.4, Ch.5, Ch.6 motor drive power supply1
34	VMST2	Power supply	Ch.4, Ch.5, Ch.6 motor drive power supply2
35	FO4	Output	Ch.4 non-inverting output

## ■ Pin Descriptions (continued)

Pin No.	Pin name	Type	Description
36	RO4	Output	Ch.4 inverting output
37	PGST	Ground	Ch.4, Ch.5, Ch.6 motor drive GND
38	FO5	Output	Ch.5 non-inverting output
39	RO5	Output	Ch.5 inverting output
40	FO6	Output	Ch.6 non-inverting output
41	RO6	Output	Ch.6 inverting output
42	GND	Ground	Control circuit GND
43	IN4	Input	Ch.4 control signal input
44	IN5	Input	Ch.5 control signal input
45	IN6	Input	Ch.6 control signal input
46	FB6	Output	Ch.6 feedback output
47	VREF	Input	Reference voltage input
48	SPIN	Input	Spindle motor drive control signal input

### ■ Absolute Maximum Ratings

A No.	Parameter	Symbol	Rating	Unit	Note
1	Supply voltage	$V_{MSP}, V_{MST}$ $V_{MAC}, V_{DD}$	6.5	V	*1
2	Supply current	$I_{VMSP}$	1 200	mA	*2
		$I_{VMAC}$	3 000	mA	*2
		$I_{VMST}$	3 100	mA	*2
		$I_{VDD}$	100	mA	*2
3	Power dissipation	$P_D$	307.8	mW	*3
4	Operating ambient temperature	$T_{opr}$	-30 to +85	°C	*4
5	Storage temperature	$T_{stg}$	-55 to +150	°C	*4

Note) \*1: The values are under the condition not exceeding the above absolute maximum ratings and the power dissipation.

\*2: Make sure that each Ch.1, Ch.2, Ch.3, Ch.4, and Ch.5 does not have a current flow exceeding 1 000 mA.

Make sure that Ch.6 does not have a current flow exceeding 1 100 mA.

\*3: The power dissipation is the value of a discrete IC package without a heat sink at  $T_a = 85^\circ\text{C}$ .

\*4: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are at  $T_a = 25^\circ\text{C}$ .

### ■ Operating Supply Voltage Range

Parameter	Symbol	Range	Unit	Note
Supply voltage range	$V_{DD}$	4.0 to 5.5	V	*
	$V_{MAC}, V_{MST}$ $V_{MSP}$	3.5 to $V_{DD}$		*

Note) \*: The values are under the condition not exceeding the above absolute maximum ratings and the power dissipation.

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