

# KA3100D

## Stepping Motor Driver

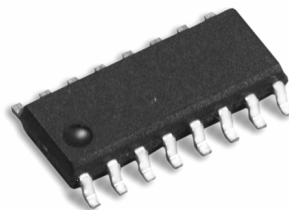
### Features

- Built-in vertical PNP power transistors
- Wide supply voltage range( $V_{CC} = 2.5V \sim 7.0V$ )
- Low saturation voltage ( $0.4V @ 0.4A$ )
- Built-in chip enable function
- Built-in shoot-through current protector
- Built-in thermal shutdown(TSD) function
- Built-in current-mode control circuit (IPEAK: 1A)

### Description

The KA3100D is a monolithic integrated circuit designed for a two-phase stepping motor driver of a FDD system.

16-SOP-225



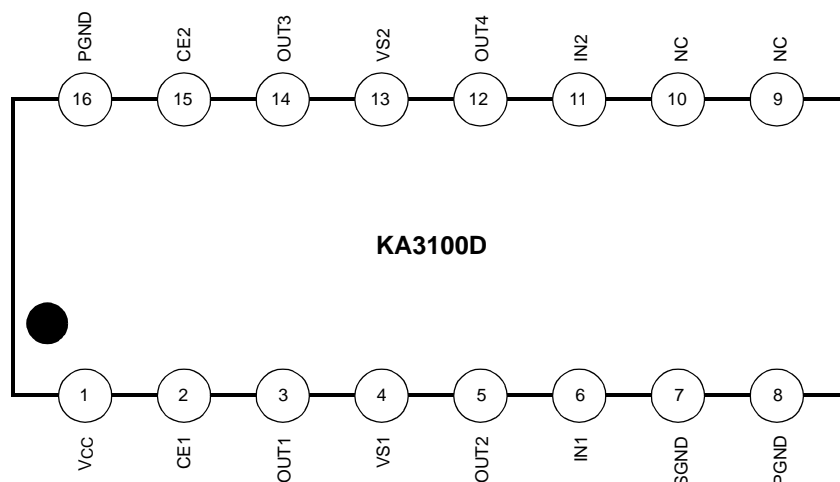
### Typical Application

- Floppy disk drive
- Camera stepping motor
- General stepping motor

### Ordering Information

Device	Package	Operating Temp.
KA3100D	16-SOP-225	-20 ~ +75°C
KA3100DTF	16-SOP-225	-20 ~ +75°C

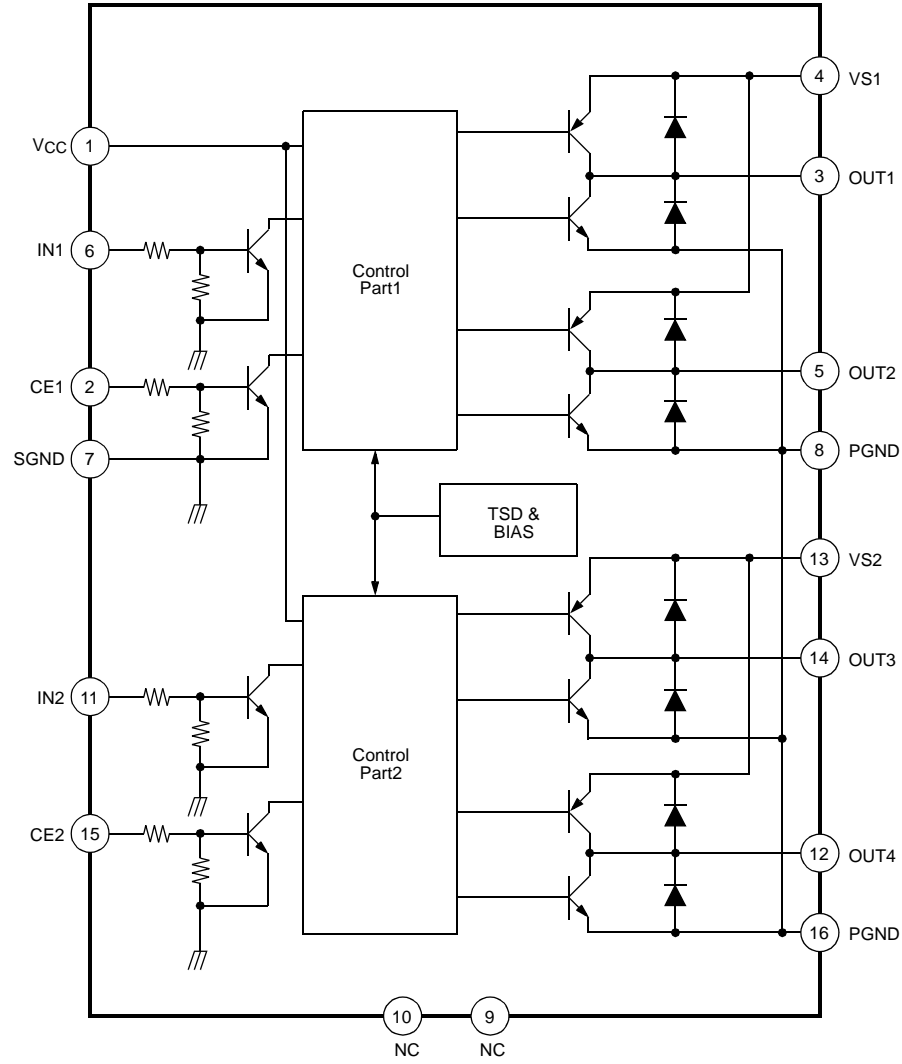
## Pin Assignments



## Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	VCC	-	Logic part supply voltage
2	CE1	I	Chip enable 1
3	OUT1	O	Output 1
4	VS1	-	Power supply 1
5	OUT2	O	Output 2
6	IN1	I	Input 1
7	SGND	-	Signal ground
8	PGND	-	Power ground
9	NC	-	No connection
10	NC	-	No connection
11	IN2	I	Input 2
12	OUT4	O	Output 4
13	VS2	-	Power supply 2
14	OUT3	O	Output 3
15	CE2	I	Chip enable 2
16	PGND	-	Power ground

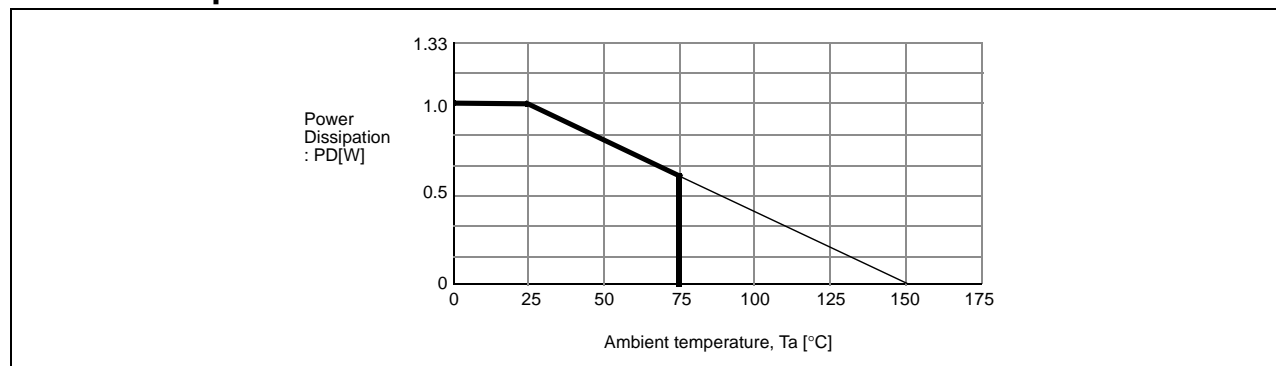
Internal Block Diagram



## Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit
Supply voltage	V <sub>CC</sub> (MAX)	9.0	V
Power supply voltage	V <sub>S</sub> (MAX)	9.0	V
Output voltage	V <sub>OUT</sub> (MAX)	V <sub>S</sub> + V <sub>ef</sub>	V
Input voltage	V <sub>IN</sub> (MAX)	7.0	V
Peak output current	I <sub>O</sub> (PEAK)	1	A
Continuous output current	I <sub>O</sub>	0.4	A
Power dissipation	P <sub>D</sub>	0.55	W
Junction temperature	T <sub>J</sub>	150	°C
Storage temperature	T <sub>STG</sub>	-40 ~ 125	°C
Operating temperature	T <sub>A</sub>	-20 ~ 75	°C

## Power Dissipation Curve



Power dissipation decreases at the rate of 13.6mW / °C when mounted on 30mm × 30mm × 1.5mm PCB (Phenolic resin material) and used above Ta=25°C.

## Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max	Unit
Logic circuit supply voltage	V <sub>CC</sub>	2.5	-	7.0	V
Power supply voltage	V <sub>S</sub>	2.5	-	7.0	V

## Electrical Characteristics

(Ta=25°C, VCC=5V, VS1=3V, VS2=3V, unless specified otherwise)

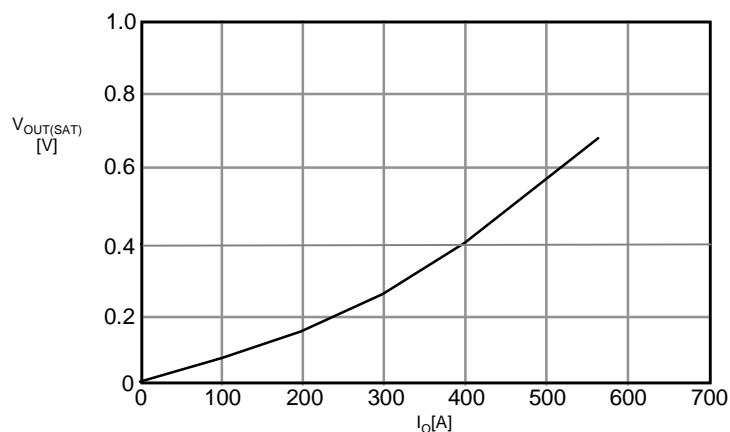
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Supply current 1	ICC1	CE1, 2=0V, VINL=3V or 0V, Each CH.	-	0.1	10	μA
Supply current 2	ICC2	CE1=3V, VINL=3V or 0V, Each CH.	-	12	18	mA
Saturation voltage 1	VSAT1	CE1=3V, VINL=3V or 0V, IOUT=0.2A	-	0.2	0.3	V
Saturation voltage 2	VSAT2	CE1=3V, VINL=3V or 0V, IOUT=0.4A	-	0.4	0.6	V
Input high level voltage	VINH	-	1.8	-	VCC	V
Input low level voltage	VINL	-	-0.3	-	0.7	V
Input current	IIN	VIN=3V, Each CH	-	100	200	μA
Chip enable current	ICE	CE=0V, Each CH	-	100	200	μA
Clamp diode leakage current	I <sub>LEAK</sub>	VCC=7V, VS=7V	-	-	30	μA
Clamp diode voltage	VEF	IOUT=0.4A	-	-	1.7	V

## Function Descriptions

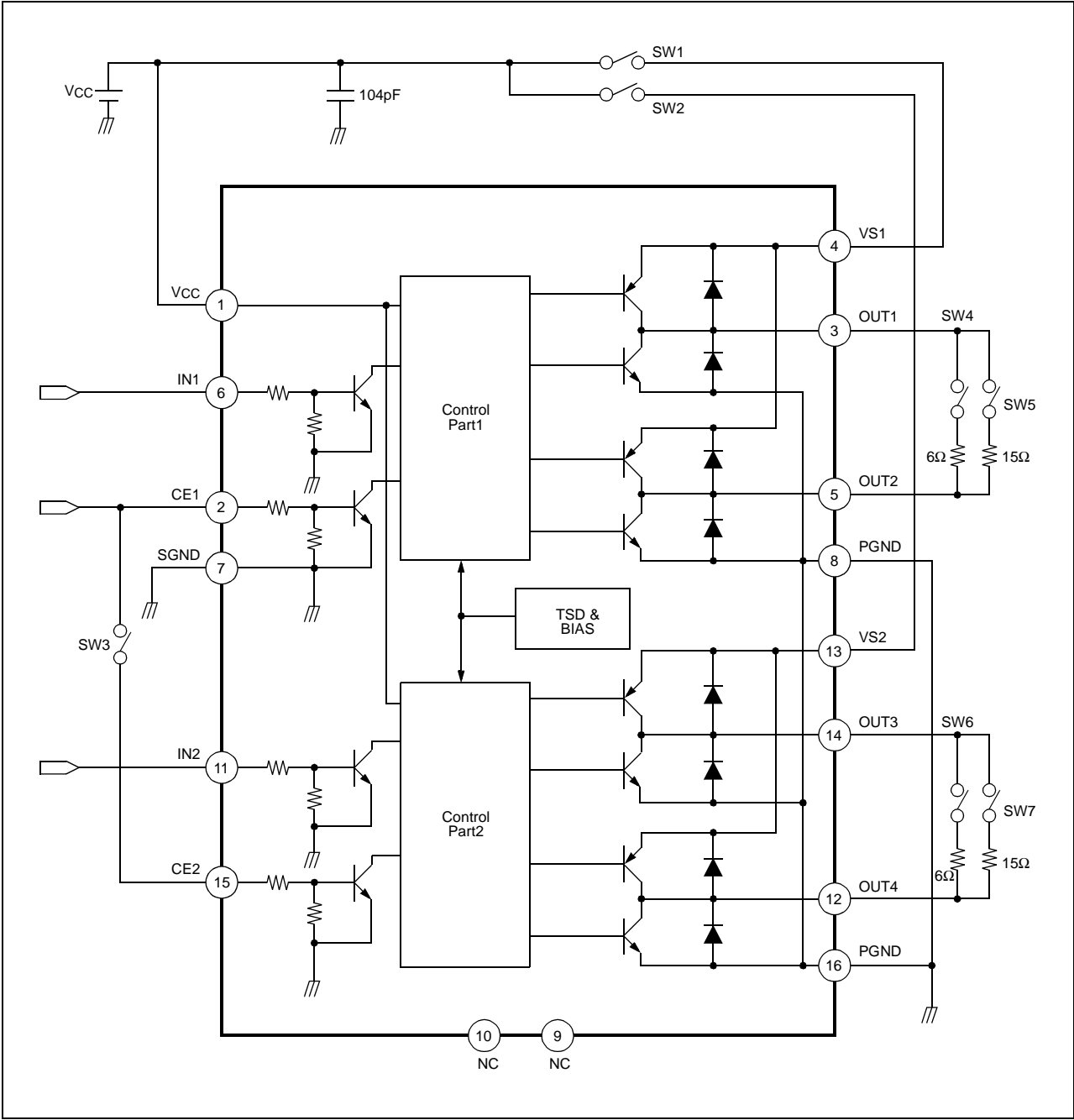
IN1 & IN2	CE1 & CE2	OUT1 & OUT3	OUT2 & OUT4	Motor rotation
Low	High	High	Low	Forward
High	High	Low	High	Reverse
Low	Low	Off	Off	Stand-by
High	Low	Off	Off	Stand-by

## Typical Performance Characteristics

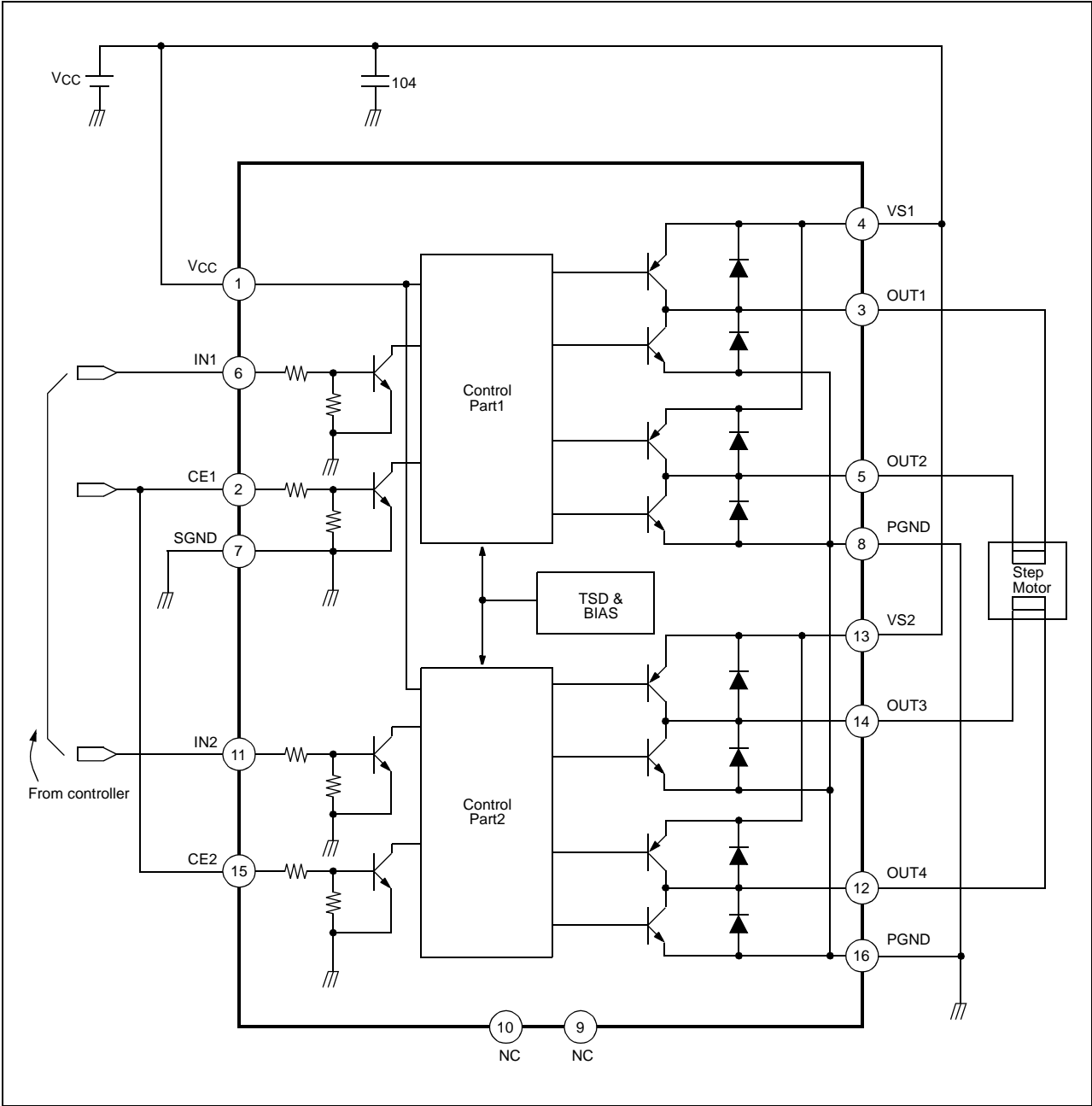
v<sub>out(sat)</sub> vs i<sub>o</sub> Characteristic Graph



Test Circuits



Typical Application Circuits



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