

# KA2821D

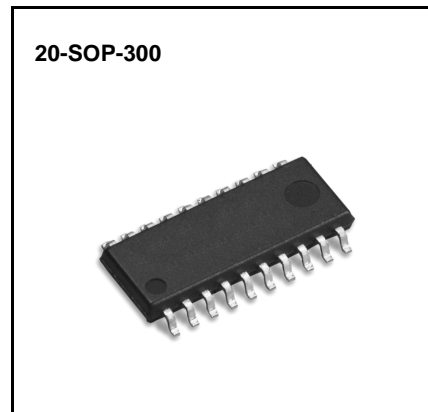
## Stepping Motor Driver

### Features

- Built-in chip enable function (Active low)
- Low saturation voltage
- Low power dissipation
- Input level: TTL, LSTTL, 5V CMOS compatible
- Standard MPU direct interface
- Built-in Thermal Shutdown(TSD) circuit
- 2-CH H-bridge driver

### Description

The KA2821D is a monolithic integrated circuit, and suitable as a two-phase stepping motor driver of a 3.5-inch FDD system.



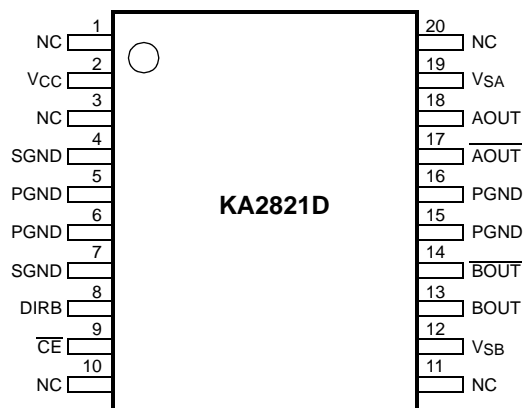
### Typical Application

- Floppy disk drive (FDD)
- General stepping motor

### Ordering Information

Device	Package	Operating Temp.
KA2821D	20-SOP-300	-20 ~ +75°C

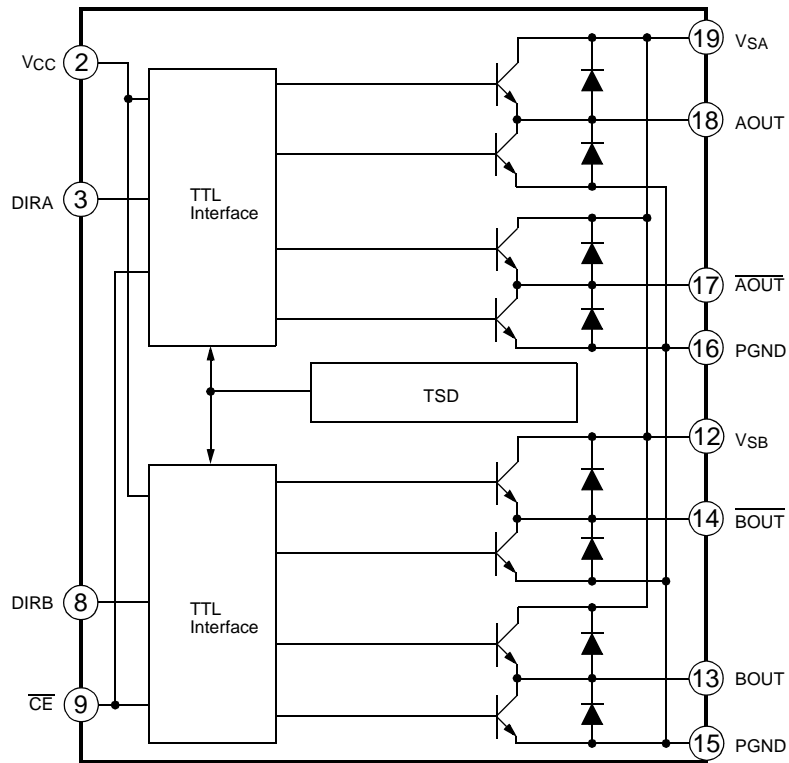
## Pin Assignments



## Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description	Channel
1	NC	-	No connection	-
2	VCC	-	Logic part supply voltage	A, B
3	DIRA	I	A-channel direction input	A
4	SGND	-	Signal ground	A, B
5	PGND	-	Power ground	A, B
6	PGND	-	Power ground	A, B
7	SGND	-	Signal ground	A, B
8	DIRB	I	B-channel direction input	B
9	CE	I	Chip enable input	A, B
10	NC	-	No connection	-
11	NC	-	No connection	-
12	VSB	-	B-channel seeking supply voltage	B
13	BOUT	O	B-channel output	B
14	$\overline{\text{BOUT}}$	O	B-channel inverting output	B
15	P-GND	-	Power ground	A, B
16	$\overline{\text{P-GND}}$	-	Power ground	A, B
17	$\overline{\text{AOUT}}$	O	A-channel inverting output	A
18	AOUT	O	A-channel output	A
19	VSA	-	A-channel seeking supply voltage	A
20	NC	-	No connection	-

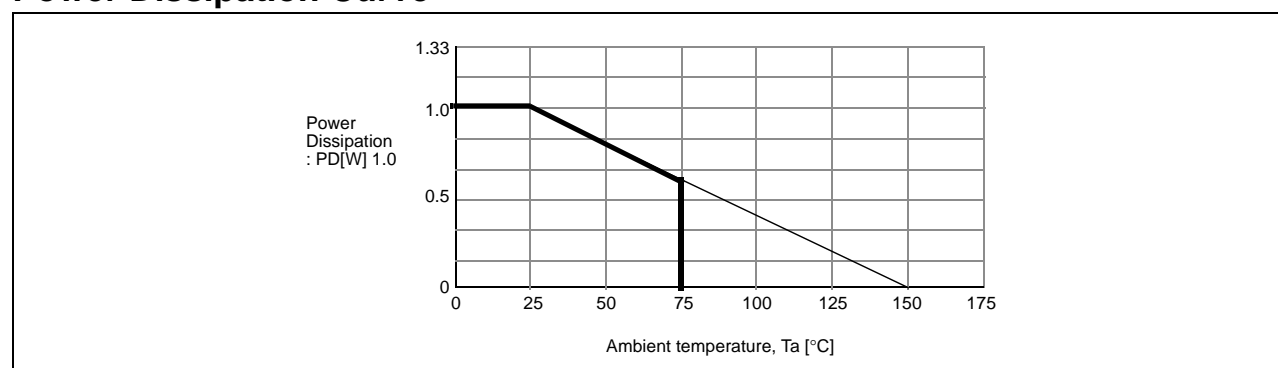
# Internal Block Diagram



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

Parameter	Symbol	Value	Unit
Logic part supply voltage	VCC	7.0	V
Seeking supply voltage	VSA, B	15.0	V
Input voltage	VIN	0 ~ VCC	V
Seeking output current (Continuouts)	IOS	330	mA
Seeking output current (Peak)	IOSPEAK	500	mA
Package power dissipation	PD	1.0	W
Operating temperature range	TOPR	-20 ~ 75	°C
Storage temperature	TSTG	-40 ~ 125	°C

## Power Dissipation Curve



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

Parameter	Symbol	Min.	Typ.	Max	Unit
Logic part supply voltage	VCC	4.5	5.0	5.5	V
Seeking supply voltage	VSA, B	4.5	-	13.8	V

## Electrical Characteristics

(Ta=25°C, VCC=5V, VSA=12V, VSB=12V, unless specified otherwise)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Digital input "L" voltage	V <sub>IL</sub>	-	-	-	0.8	V
Digital high level input voltage	V <sub>IH</sub>	-	2.0	-	-	V
Digital low input current	I <sub>IL</sub>	V <sub>IN</sub> =0.8V	-	0	10	μA
Digital high input current	I <sub>IH1</sub>	V <sub>IN</sub> =2.0V	-	1	10	μA
	I <sub>IH2</sub>	V <sub>IN</sub> =5V	-	0.3	1.0	mA
	I <sub>VCCL</sub>	CE=0.8V	-	25	3	mA
Supply current	I <sub>VSL</sub>	CE=0.8V	-	6	10	mA
	I <sub>VCCH</sub>	CE=0.8V	-	25	33	mA
	I <sub>VSH</sub>	CE=2.0V	-	1	2	mA
Output sustain voltage	V <sub>SUS</sub>	I <sub>O</sub> =10mA, CE=0.8V	18	-	-	V
V <sub>SA, B</sub> output saturation voltage	V <sub>SAT1</sub>	I <sub>O</sub> =300mA, CE=2.0V	-	1.5	2.0	V
Output clamp voltage	V <sub>FU</sub>	I <sub>O</sub> =130mA (Upper)	-	3.0	5.0	V
	V <sub>FL</sub>	I <sub>O</sub> =330mA (Lower)	-	1.5	2.0	V
Output delay time	T <sub>PLH</sub>	Input pulse (2kHz)	-	1.0	5.0	μs
	T <sub>PHL</sub>	Input pulse (2kHz)	-	1.0	5.0	μs
TSD operating temperature	TSD	-	125	150	-	°C
TSD hysteresis	ΔTSD	-	-	25	-	°C

## Application Information

### 1. MOTOR CONTROL LOGIC

Mode selection-truth table

Input		Output		Operating Mode
CE	DIRY	YOUT	YOUT	
L	L	L	H	Seeking Mode
L	H	H	L	
H	L	X	X	Open Mode
H	H	X	X	

**Notes:**

DIRY: DIRA or DIRB (Direction input)

YOUT: AOUT or BOUT (Non-inverting output)

YOUT: AOUT or BOUT (Inverting output)

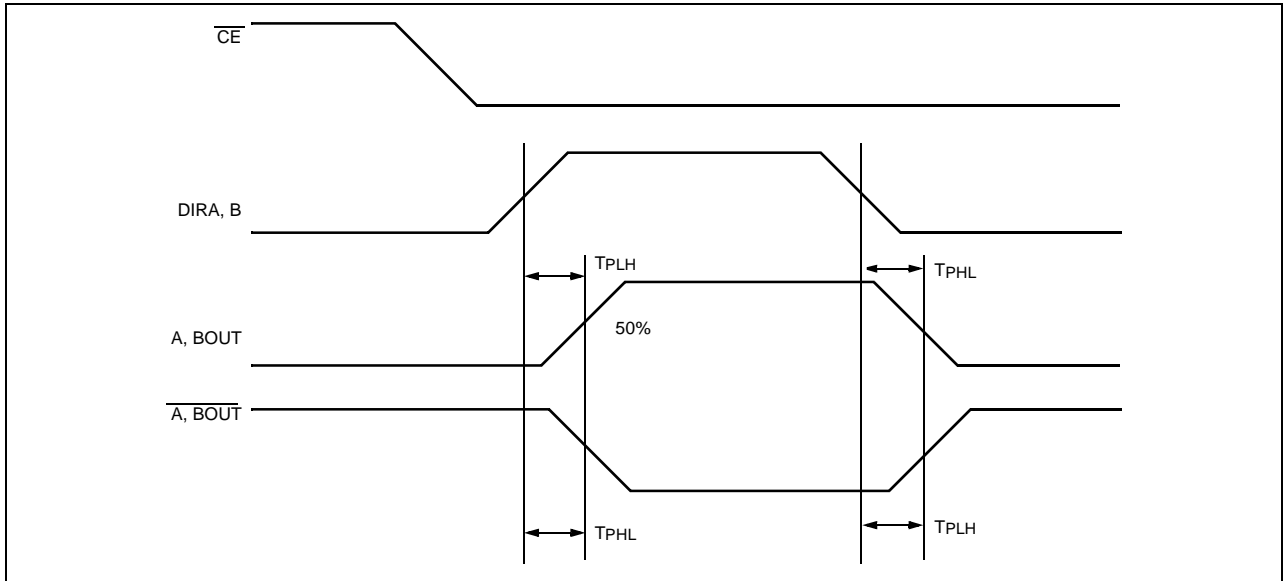
Y: Indicate each channel (A and B)

X: High impedance

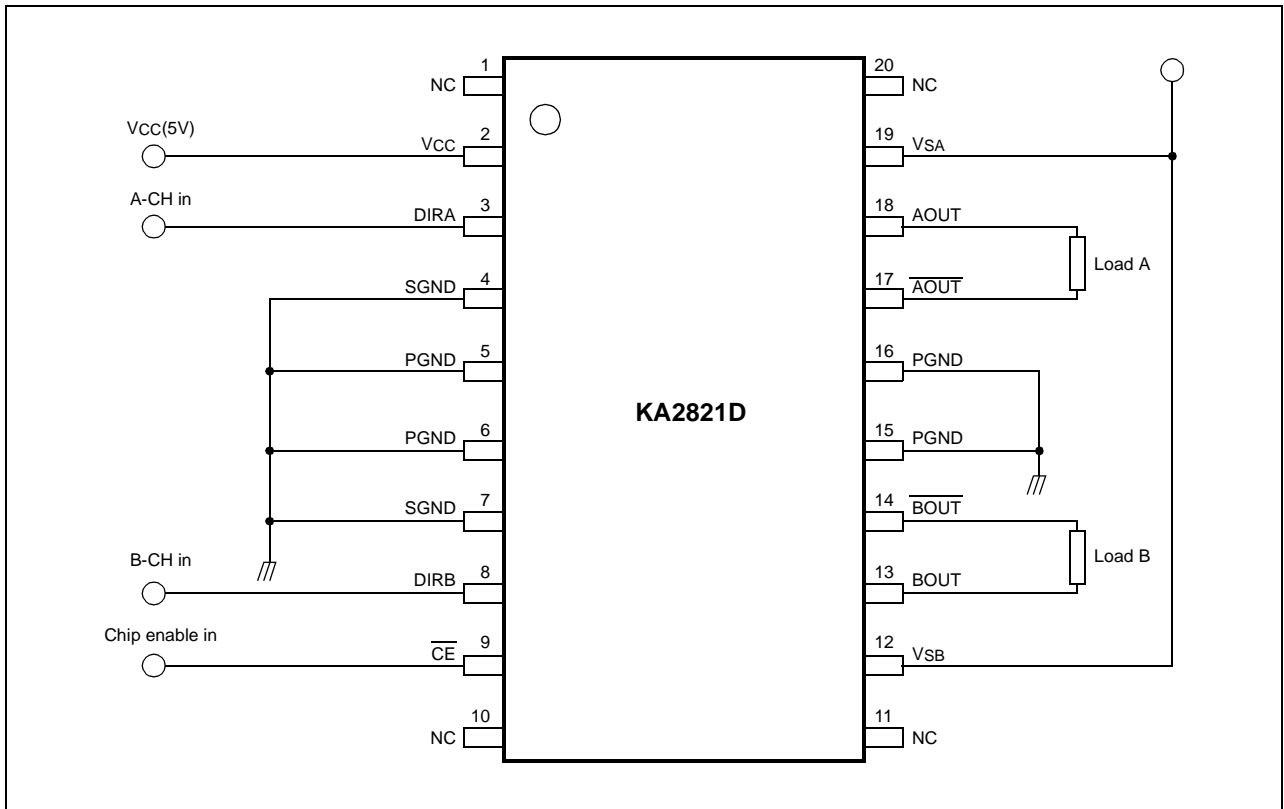
### 2. MAXIMUM CURRENT DRIVE CAPACITY

- Peak seeking output current: 0.5A
- Continuous seeking output current: 0.33A
- Holding output current: 0.2A

## Timing Chart



## Typical Application Circuits



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