FAIRCHILD SEMICONDUCTOR TM

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KA2821D

Stepping Motor Driver

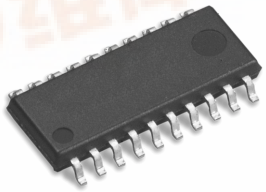
Features

- 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.

20-SOP-300



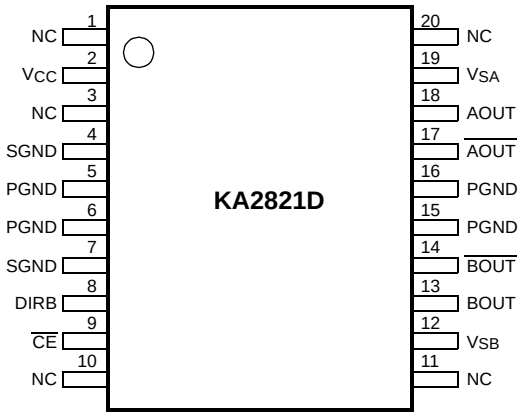
Typical Application

- Floppy disk drive (FDD)
- General stepping motor

Ordering Information

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

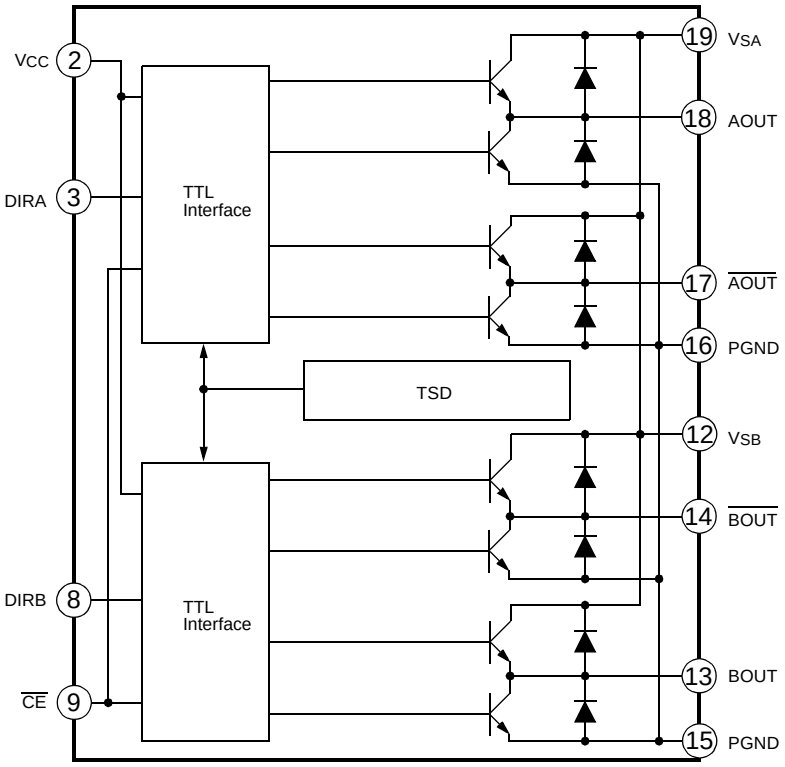
Pin Assignments



Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description	Channel
1	NC	-	No connection	-
2	V_{CC}	-	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	V_{SB}	-	B-channel seeking supply voltage	B
13	BOUT	O	B-channel output	B
14	$\overline{BOUT}$	O	B-channel inverting output	B
15	P-GND	-	Power ground	A, B
16	P-GND	-	Power ground	A, B
17	$\overline{AOUT}$	O	A-channel inverting output	A
18	AOUT	O	A-channel output	A
19	V_{SA}	-	A-channel seeking supply voltage	A
20	NC	-	No connection	-

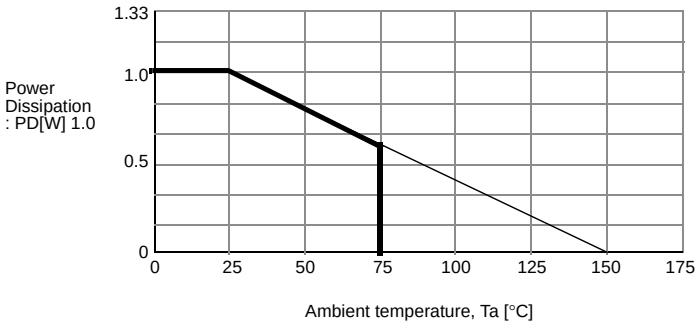
Internal Block Diagram



Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit
Logic part supply voltage	V_{CC}	7.0	V
Seeking supply voltage	$V_{SA, B}$	15.0	V
Input voltage	V_{IN}	0 ~ V_{CC}	V
Seeking output current (Continuouts)	I_{OS}	330	mA
Seeking output current (Peak)	I_{OSPEAK}	500	mA
Package power dissipation	P_D	1.0	W
Operating temperature range	T_{OPR}	–20 ~ 75	°C
Storage temperature	T_{STG}	–40 ~ 125	°C

Power Dissipation Curve



Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max	Unit
Logic part supply voltage	V_{CC}	4.5	5.0	5.5	V
Seeking supply voltage	$V_{SA, B}$	4.5	-	13.8	V

Electrical Characteristics

(Ta=25°C, V_{CC}=5V, V_{SA}=12V, V_{SB}=12V, unless specified otherwise)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Digital input “L” voltage	V_{IL}	-	-	-	0.8	V
Digital high level input voltage	V_{IH}	-	2.0	-	-	V
Digital low input current	I_{IL}	V_{IN}=0.8V	-	0	10	µA
Digital high input current	I_{IH1}	V_{IN}=2.0V	-	1	10	µA
	I_{IH2}	V_{IN}=5V	-	0.3	1.0	mA
	IV_{CCL}	CE=0.8V	-	25	3	mA
Supply current	IV_{SL}	CE=0.8V	-	6	10	mA
	IV_{CCH}	CE=0.8V	-	25	33	mA
	IV_{SH}	CE=2.0V	-	1	2	mA
Output sustain voltage	V_{SUS}	I_O=10mA, CE=0.8V	18	-	-	V
$V_{SA, B}$ output saturation voltage	V_{SAT1}	I_O=300mA, CE=2.0V	-	1.5	2.0	V
Output clamp voltage	V_{FU}	I_O=130mA (Upper)	-	3.0	5.0	V
	V_{FL}	I_O=330mA (Lower)	-	1.5	2.0	V
Output delay time	T_{PLH}	Input pulse (2kHz)	-	1.0	5.0	µs
	T_{PHL}	Input pulse (2kHz)	-	1.0	5.0	µs
TSD operating temperature	TSD	-	125	150	-	°C
TSD hysterisis	ΔTSD	-	-	25	-	°C

Application Information

1. MOTOR CONTROL LOGIC

Mode selection-truth table

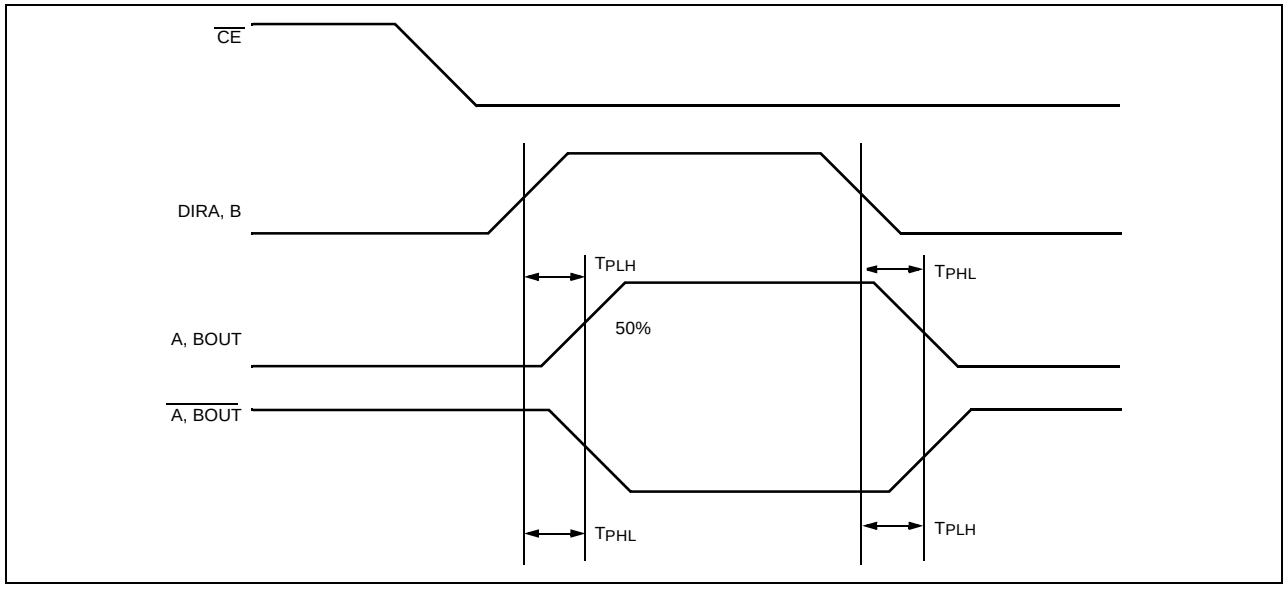
Input		Output		Operating Mode
CE	DIRY	YOUT	YOUT	
L	L	L	H	Seeking Mode
L	H	H	L	
H	L	X	X	Open Mode
H	H	X	X	

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

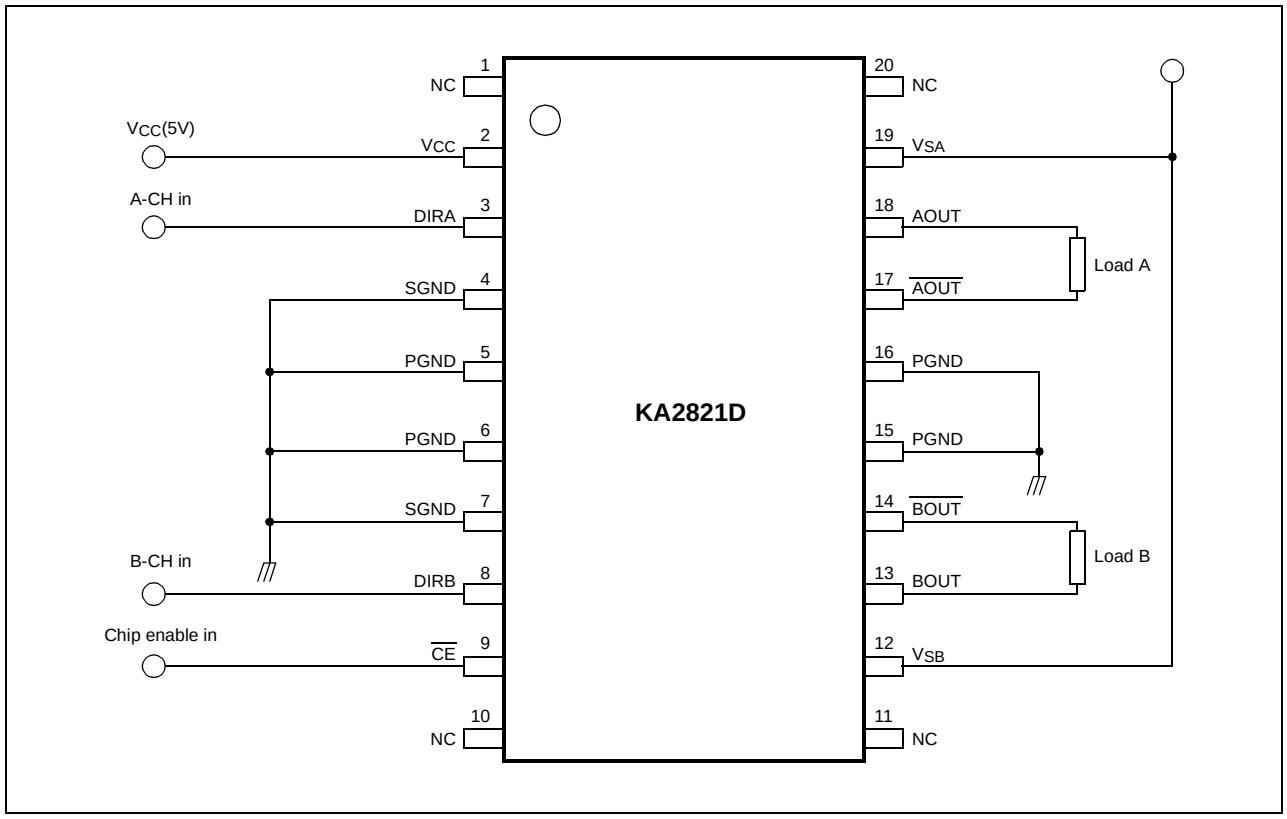
2. MAXIMUM CURRENT DRIVE CAPACITY

- 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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