STEPPING MOTOR DRIVER
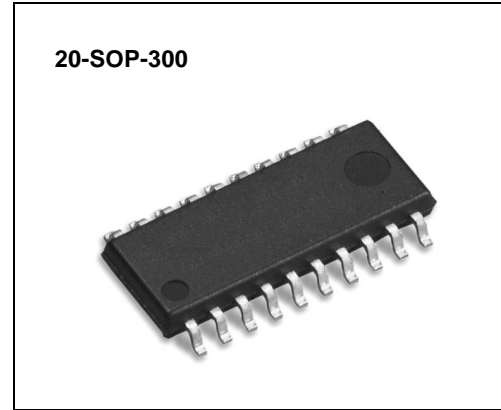
The KA2821D is a monolithic integrated circuit, and suitable as a the two-phase stepping motor driver of a 3.5" FDD system.

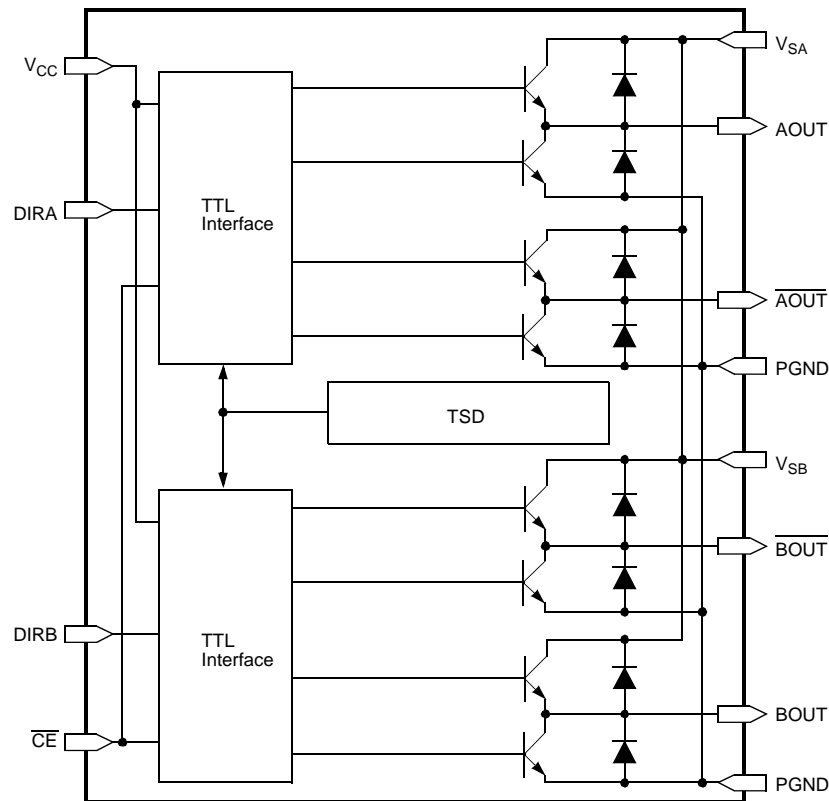**20-SOP-300**

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
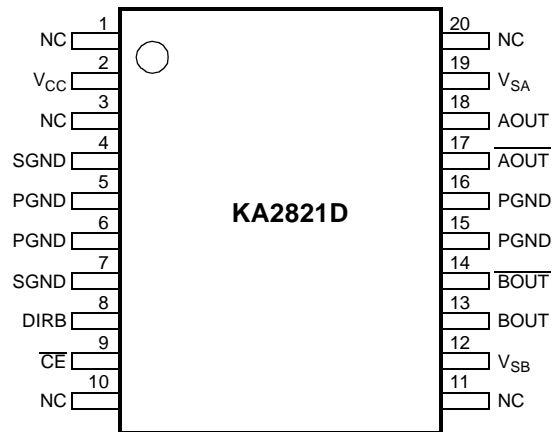
- Built-in TSD

- 2-CH H-bridge driver

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2821D	20-SOP-300	$-20 \sim +75°C$

BLOCK DIAGRAM

PIN CONFIGURATION

PIN DESCRIPION

Pin No.	Symbol	Description	channel
1	NC	No connection	–
2	V_{CC}	Logic part supply voltage	A, B
3	DIRA	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	B-channel direction input	B
9	CE	Chip enable input	A, B
10	NC	No connection	–
11	NC	No connection	–
12	V_{SB}	B-channel seeking supply voltage	B
13	BOUT	B-channel output	B
14	$\overline{BOUT}$	B-channel inverting output	B
15	P-GND	Power ground	A, B
16	P-GND	Power ground	A, B
17	$\overline{AOUT}$	A-channel inverting output	A
18	AOUT	A-channel output	A
19	V_{SA}	A-channel seeking supply voltage	A
20	NC	No connection	–

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ABSOLUTE MAXIMUM RATING (Ta=25°C)

Characteristics	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}	$0 \sim V_{CC}$	V
Seeking output current (Continuouts)	I_{OS}	330	A
Seeking output current (Peak)	I_{OSPEAK}	500	A
Package power dissipation	P_D	1.0	W
Operating temperature range	T_{OPR}	$-20 \sim 75$	°C
Storage temperature	T_{STG}	$-40 \sim 125$	°C

Power Dissipation : PD[W] 1.0

1.33
1.0
0.5
0

0   25   50   75   100   125   150   175

Ambient temperature, Ta [°C]
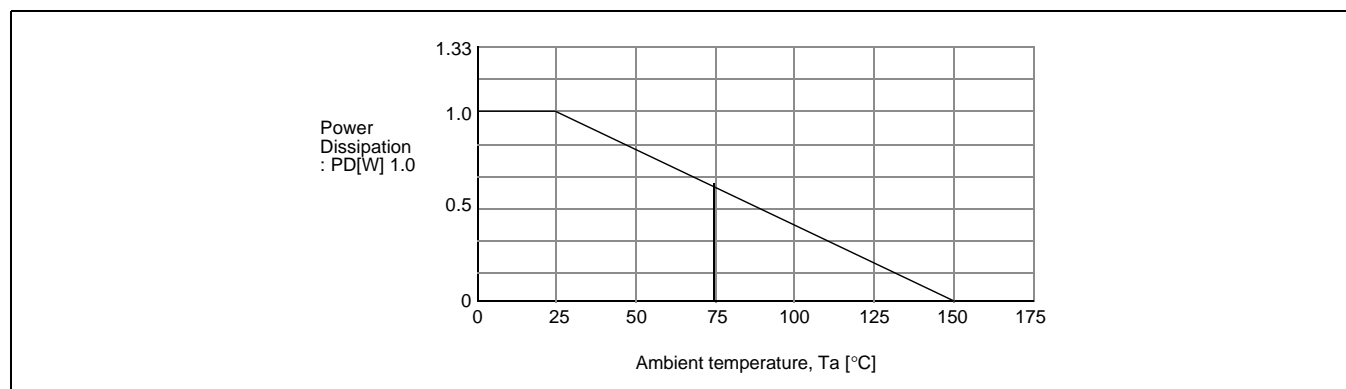
RECOMMENDED OPERATING CONDITIONS

Characteristics	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)

Characteristic	Symbol	Test conditions	Min.	Typ.	Max.	Unit
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}	$\overline{CE}$=0.8V	–	25	3	mA
Supply current	IV_{SL}	$\overline{CE}$=0.8V	–	6	10	mA
	IV_{CCH}	$\overline{CE}$=0.8V	–	25	33	mA
	IV_{SH}	$\overline{CE}$=2.0V	–	1	2	mA
Output sustain voltage	V_{SUS}	I_O=10mA, $\overline{CE}$=0.8V	18	–	–	V
$V_{SA, B}$ output saturation voltage	V_{SAT1}	I_O=300mA, $\overline{CE}$=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	$\overline{\text{YOUT}}$	
L	L	L	H	Seeking Mode
L	H	H	L	
H	L	X	X	Open Mode
H	H	X	X	

NOTE:
DIRY: DIRA or DIRB (Direction input)
YOUT: AOUT or BOUT (Non-inverting output)
$\overline{\text{YOUT}}$: $\overline{\text{AOUT}}$ or $\overline{\text{BOUT}}$ (Inverting output)
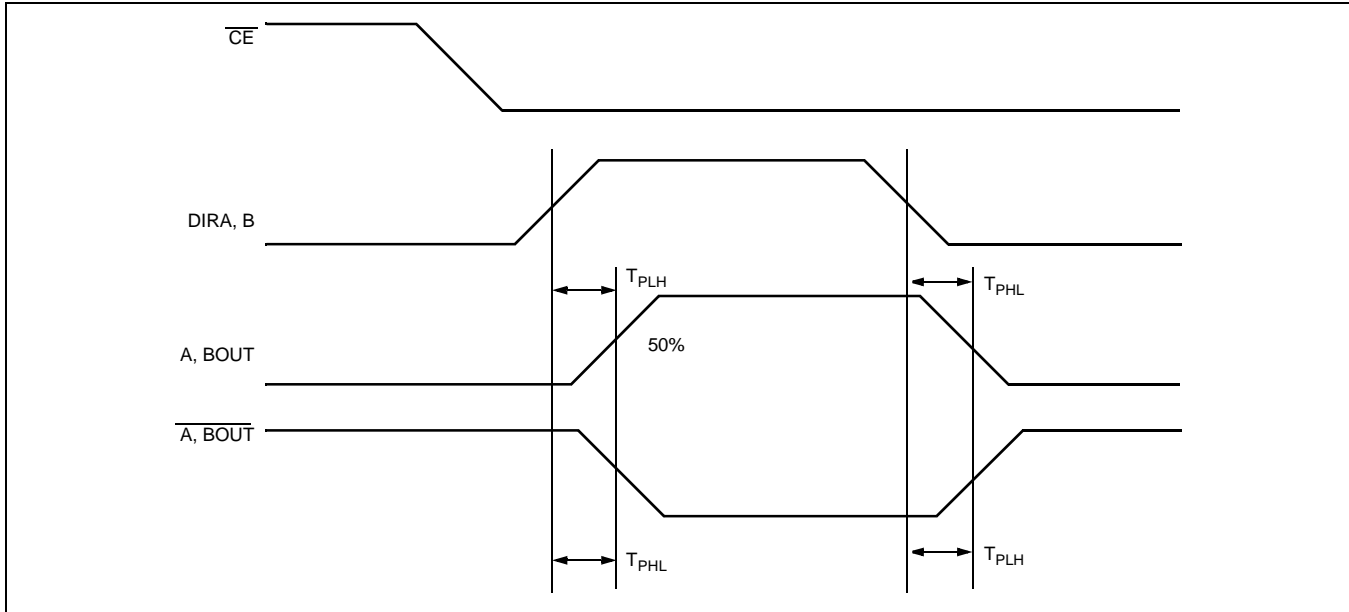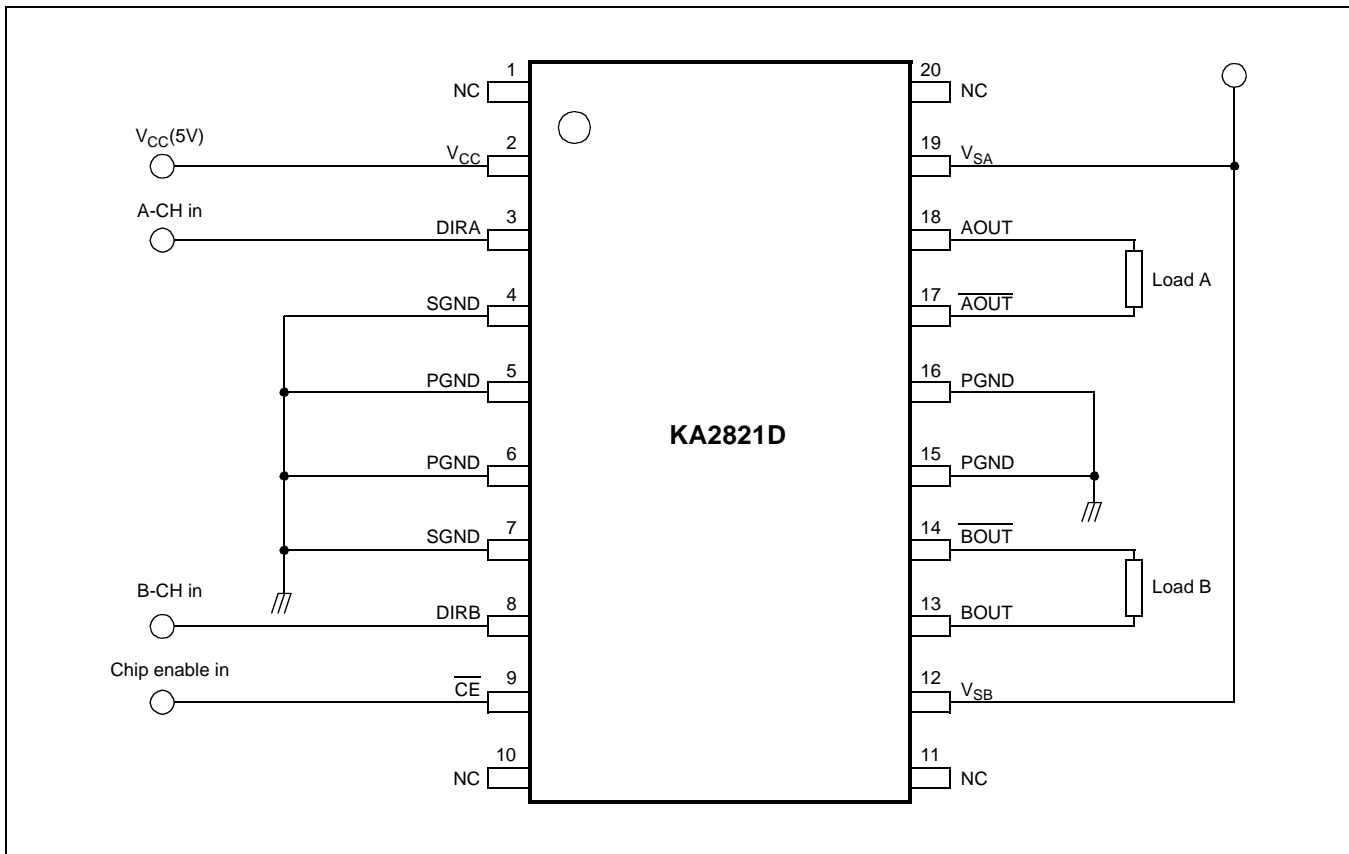Y: Indicate each channel (A and B)
X: High impedance

2. MAXIMUM CURRENT DRIVE CAPACITY

• Peak seeking output current: 0.5A

• Continuous seeking output current: 0.33A

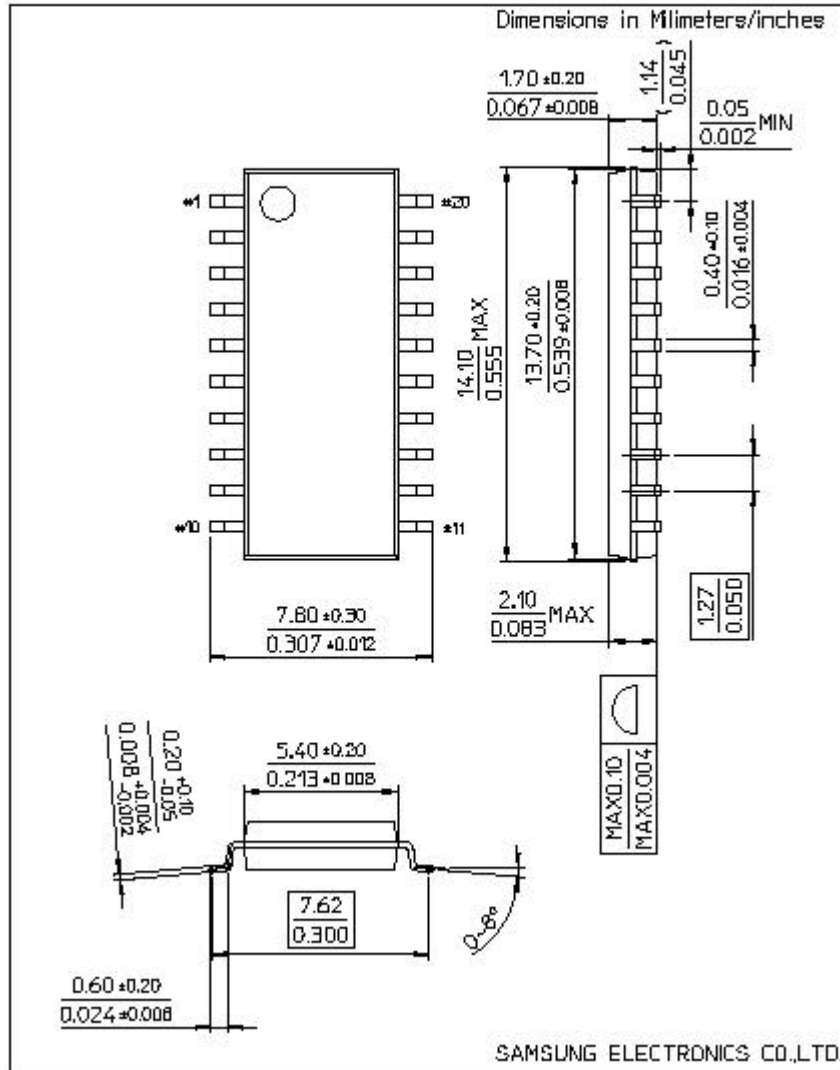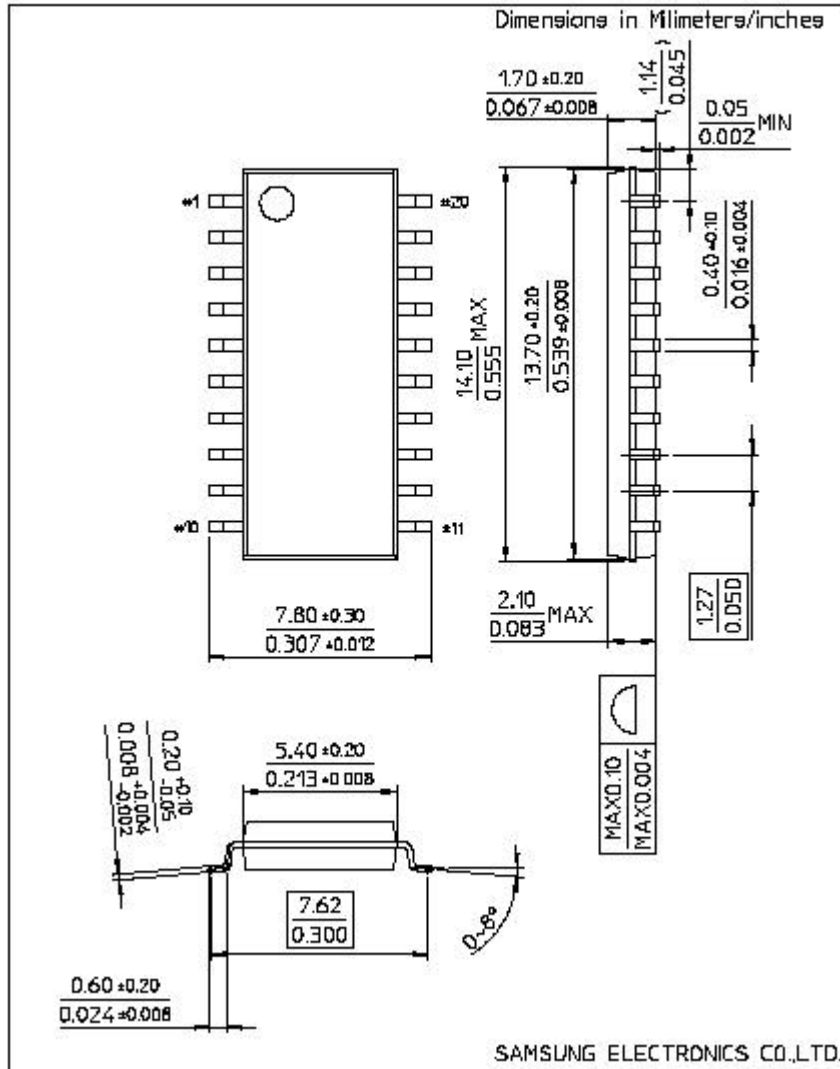• Holding output current: 0.2A

TIMING CHART

APPLICATION CIRCUIT

MIC-98D002
August 1998

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PACKAGE DIMENSION

20—SOP—300

Dimensions in Milimeters/inches

SAMSUNG ELECTRONICS CO.,LTD.

PACKAGE DIMENSION

20−SOP−300

Dimensions in Milimeters/inches

$\dfrac{1.70 \pm 0.20}{0.067 \pm 0.008}$

$\dfrac{1.14}{0.045}$

$\dfrac{0.05}{0.002}$ MIN

$\dfrac{0.40 \pm 0.10}{0.016 \pm 0.004}$

#1   #20

#10   #11

$\dfrac{14.10}{0.555}$ MAX

$\dfrac{13.70 \pm 0.20}{0.539 \pm 0.008}$

$\dfrac{7.80 \pm 0.30}{0.307 \pm 0.012}$

$\dfrac{2.10}{0.083}$ MAX

$\dfrac{1.27}{0.050}$

$\dfrac{\text{MAX}\,0.10}{\text{MAX}\,0.004}$

$\dfrac{0.20 {}^{+0.10}_{-0.05}}{0.008 {}^{+0.004}_{-0.002}}$

$\dfrac{5.40 \pm 0.20}{0.213 \pm 0.008}$

$\dfrac{7.62}{0.300}$

$0−8°$

$\dfrac{0.60 \pm 0.20}{0.024 \pm 0.008}$

SAMSUNG ELECTRONICS CO.,LTD.

MIC-98D002
August 1998

FAIRCHILD
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.