

STEPPING MOTOR DRIVER

The KA2820D2 is a monolithic integrated circuit, and suitable as a the two-phase stepping motor driver of a 5.25" FDD system.

FEATURES

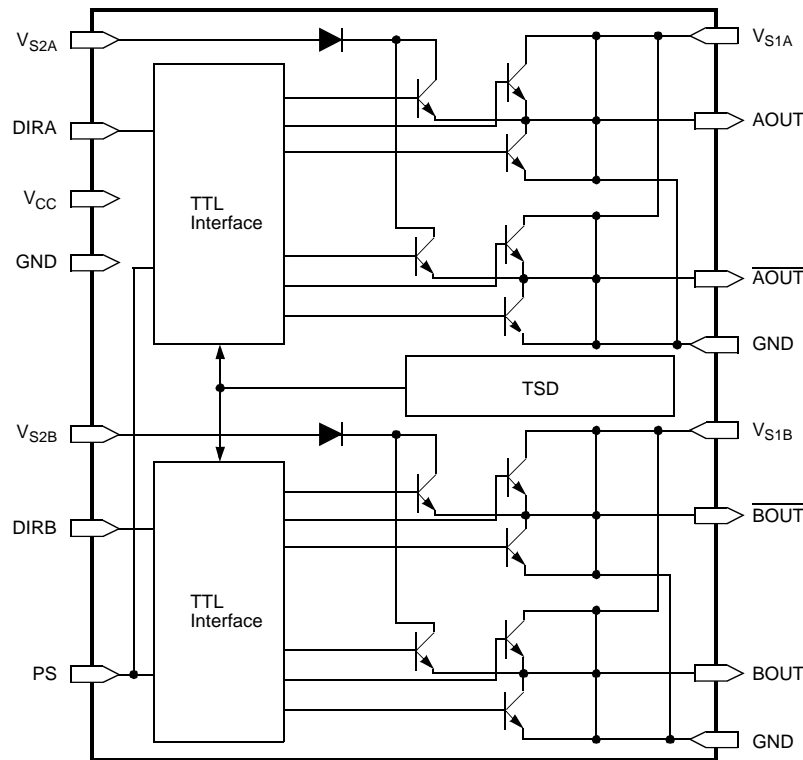
- Built-in power save function
- Low saturation voltage
- Low power dissipation
- Input level: TTL, LSTTL, 5V CMOS compatible
- Standard MPU direct interface
- Built-in TSD circuit



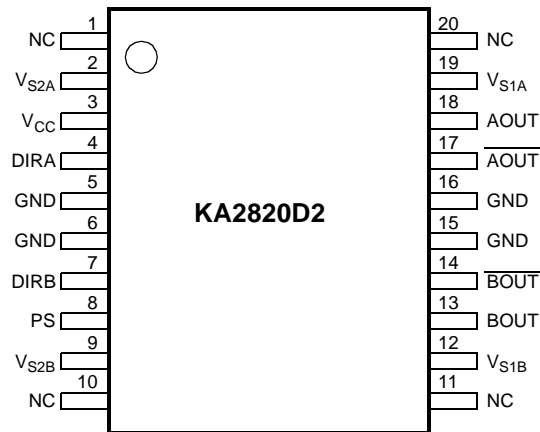
ORDERING INFORMATION

Device	Package	Operating Temperature
KA2820D2	20-SOP-375	-20 ~ +75°C

BLOCK DIAGRAM



PIN CONFIGURATION



PIN DESCRIPTION

Pin No.	Symbol	Description	channel
1	NC	No connection	–
2	V_{S2A}	A-channel holding supply voltage	A
3	V_{CC}	Logic part supply voltage	A, B
4	DIRA	A-channel direction input	A
5	GND	Signal ground	A, B
6	GND	Signal ground	A, B
7	DIRB	B-channel direction input	B
8	PS	Power save input	A, B
9	V_{S2B}	B-channel holding supply voltage	B
10	NC	No connection	–
11	NC	No connection	–
12	V_{S1B}	B-channel seeking supply voltage	B
13	\overline{BOUT}	B-channel output	B
14	BOUT	B-channel inverting output	B
15	GND	Power ground	A, B
16	GND	Power ground	A, B
17	\overline{AOUT}	A-channel inverting output	A
18	AOUT	A-channel output	A
19	V_{S1A}	A-channel seeking supply voltage	A
20	NC	No connection	–

ABSOLUTE MAXIMUM RATING (Ta=25°C)

Characteristics	Symbol	Value	Unit
Logic part supply voltage	V_{CC}	7.0	V
Seeking supply voltage	V_{S1}	15.0	V
Holding supply voltage	V_{S2}	7.0	V
Input voltage	V_{IN}	V_{CC}	V
Seeking output current (Continuouts)	I_{OS}	330	mA
Seeking output current (Peak)	I_{OSPEAK}	500	mA
Holding output current	I_{OH}	200	mA
Package power dissipation	P_D	1.0	W
Operating temperature range	T_{OPR}	-20 ~ 75	°C
Storage temperature	T_{STG}	-40 ~ 125	°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_{S1}	10.2	12.0	13.8	V
Holding supply voltage	V_{S2}	4.5	5.0	5.5	V

ELECTRICAL CHARACTERISTICS

(Ta=25°C, V_{CC}=5V, V_{S1}=12V, V_{S2}=5V, unless specified otherwise)

Characteristic	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Digital input "L" voltage	V _{IL}	–	–	–	0.8	V
Digital input "H" voltage	V _{IH}	–	2.0	–	–	V
Digital input "L" current	I _{IL}	V _{IN} =0.8V	–	0	10	μA
Digital input "H" current	I _{IH1}	V _{IN} =2.0V	–	1	10	μA
	I _{IH2}	V _{IN} =5V	–	0.3	1.0	mA
	I _{VCC}	PS=0.8V	–	25	33	mA
	I _{V_{S1}L}	PS=0.8V	–	6	10	mA
Supply current	I _{V_{S2}L}	PS=0.8V	–	–	0.1	mA
	I _{V_{CC}H}	PS=2.0V	–	25	33	mA
	I _{V_{S1}H}	PS=2.0V	–	1	2	mA
	I _{V_{S2}H}	PS=2.0V	–	2.5	4	mA
Output sustain voltage	V _{SUS}	I _O =130mA, PS=0.8V	18	–	–	V
VS1 output saturation voltage	V _{SAT1}	I _O =130mA, PS=2.0V	–	1.5	2.0	V
VS2 output saturation voltage	V _{SAT2}	I _O =130mA	–	1.5	2.0	V
Output clamp voltage	V _{FU}	I _O =330mA (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 hysteresis	ΔTSD	–	–	25	–	°C

APPLICATION INFORMATION

1. MOTOR CONTROL LOGIC

Mode selection-truth table

Input		Output			Operating Mode
PS	DIRX	XOUT	\overline{XOUT}		
L	L	L	H+	Seeking Mode	H+: Operating by V_{S1} ($V_{S1}=12V$)
L	H	H+	L		
H	L	L	H-	Open Mode	H-: Operating by V_{S2} ($V_{S2}=5V$)
H	H	H-	L		

NOTE:

DIRX: DIRA or DIRB (Direction input)

XOUT: AOUT or BOUT (Non-inverting output)

\overline{XOUT} : \overline{AOUT} or \overline{BOUT} (Inverting output)

X: Indicate each channel (A and B)

2. HOLDING AND SEEKING MODE

In rotating high speed (Seeking Mode), stepping motor is operated by high voltage (V_{S1} : Seeking power supply voltage "12").

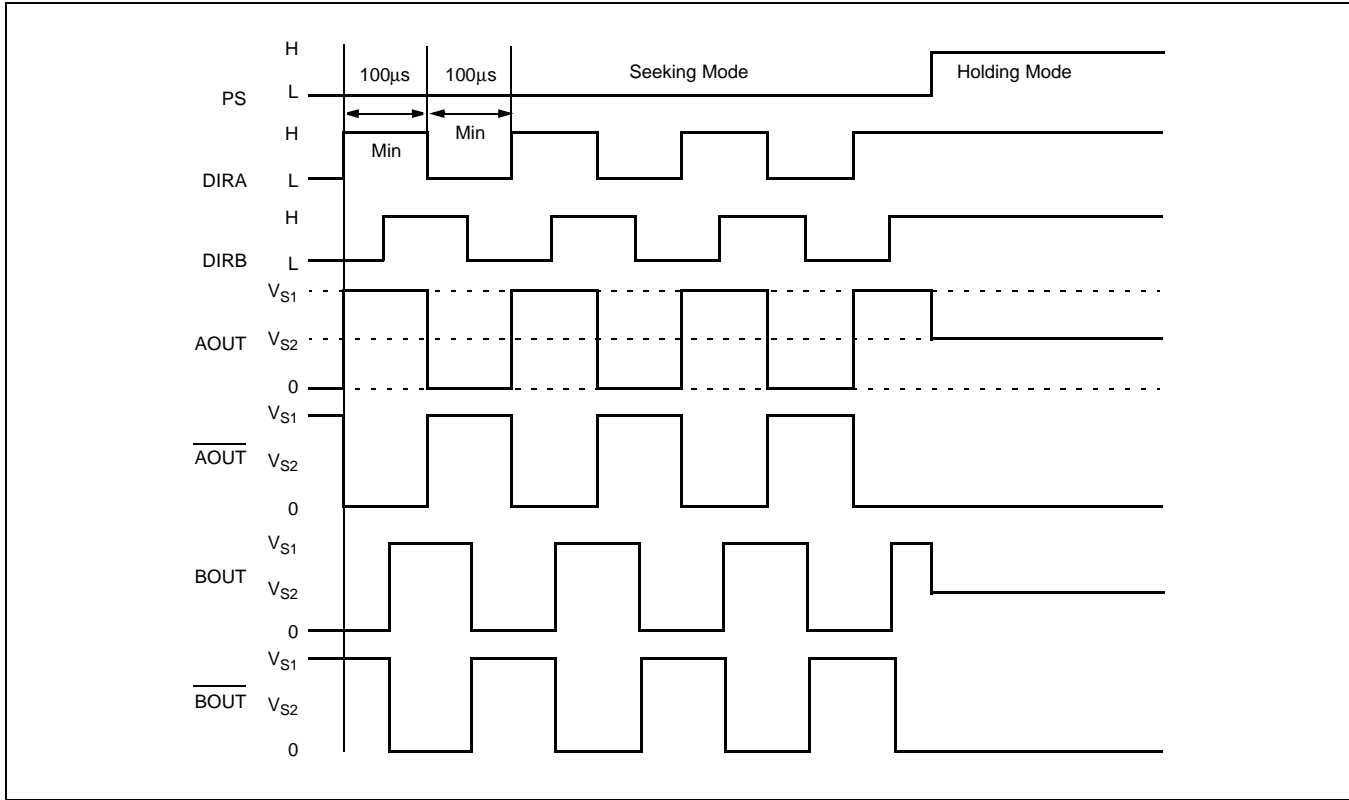
In holding mode, stepping motor is operated by low voltage (V_{S2} : Holding power supply voltage "5").

When the PS input signal is high, it will be minimized power consumption in this device.

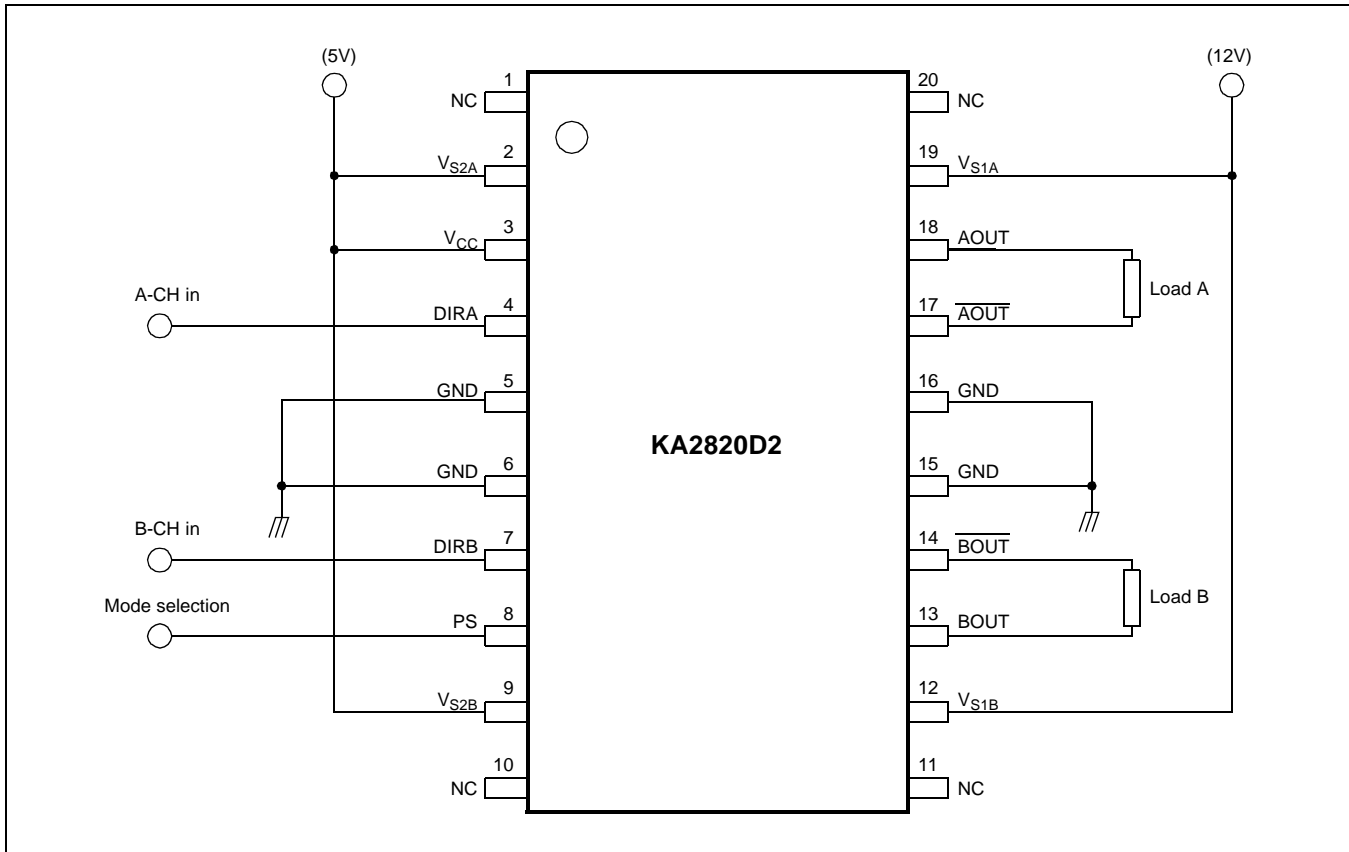
3. MAXIMUM DRIVE CURRENT CAPACITY AS FOLLOWS

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

TIMING CHART

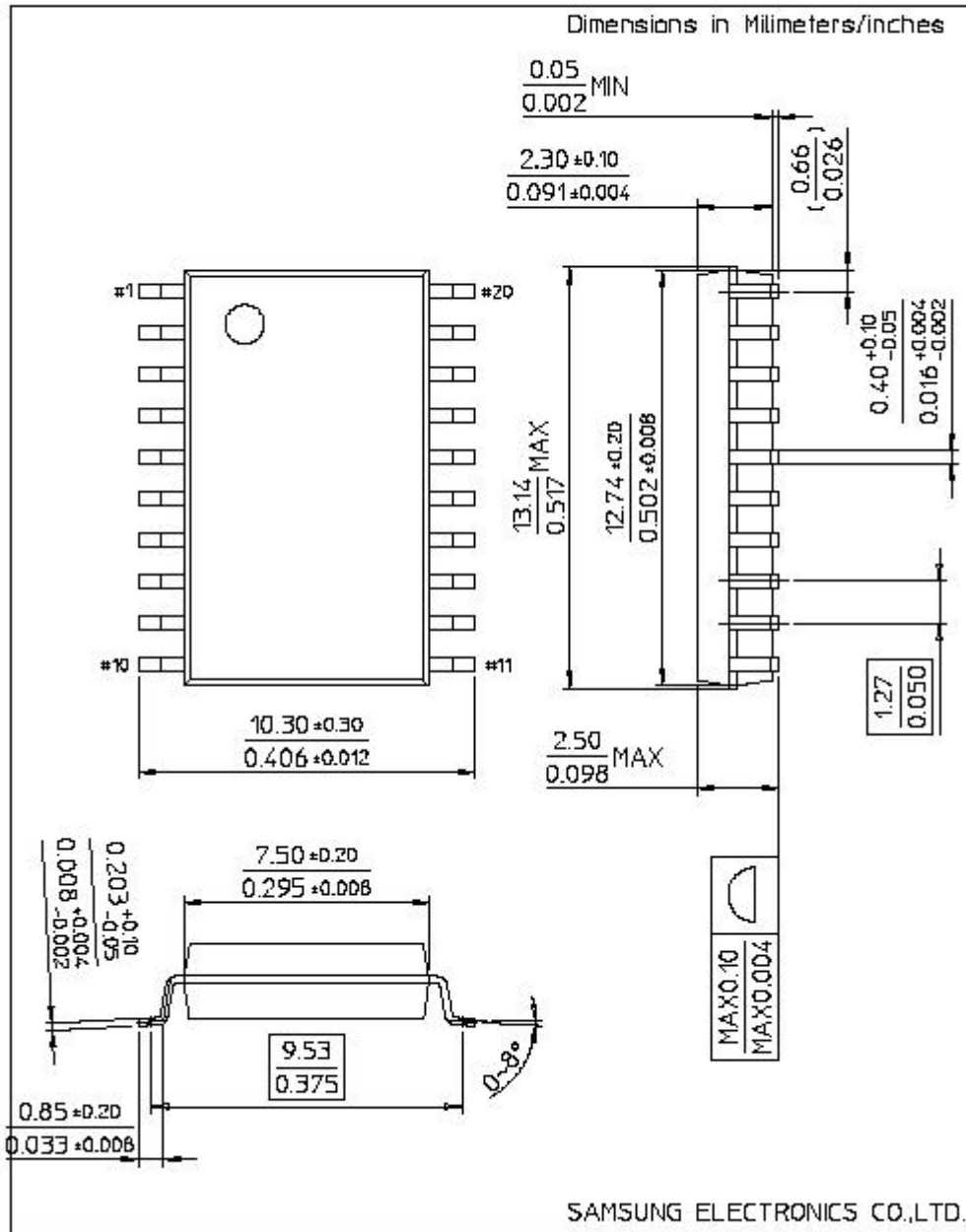


APPLICATION CIRCUIT



PACKAGE DIMENSION

20-SOP-375



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