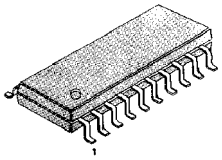
PRODUCTS

STEPPING MOTOR DRIVER

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

20-SOP-375



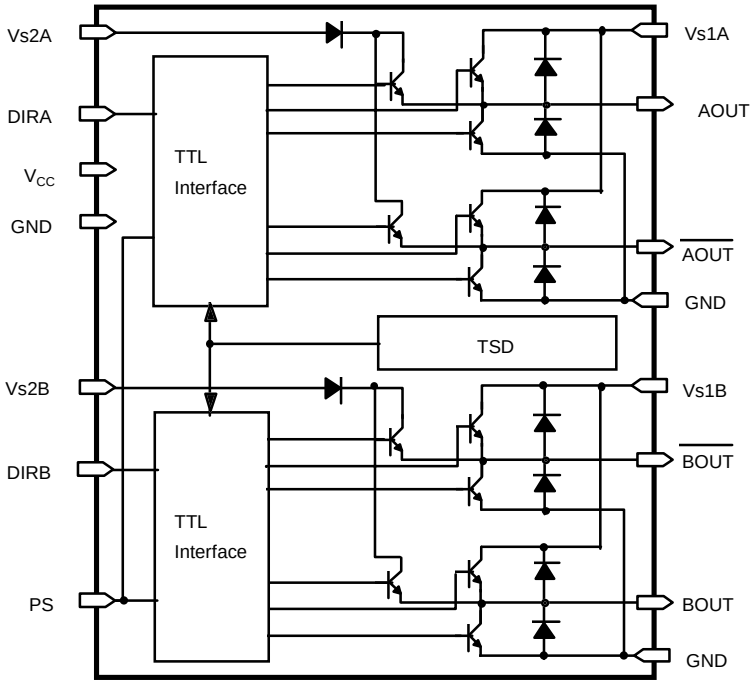
FEATURES

- 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

BLOCK DIAGRAM



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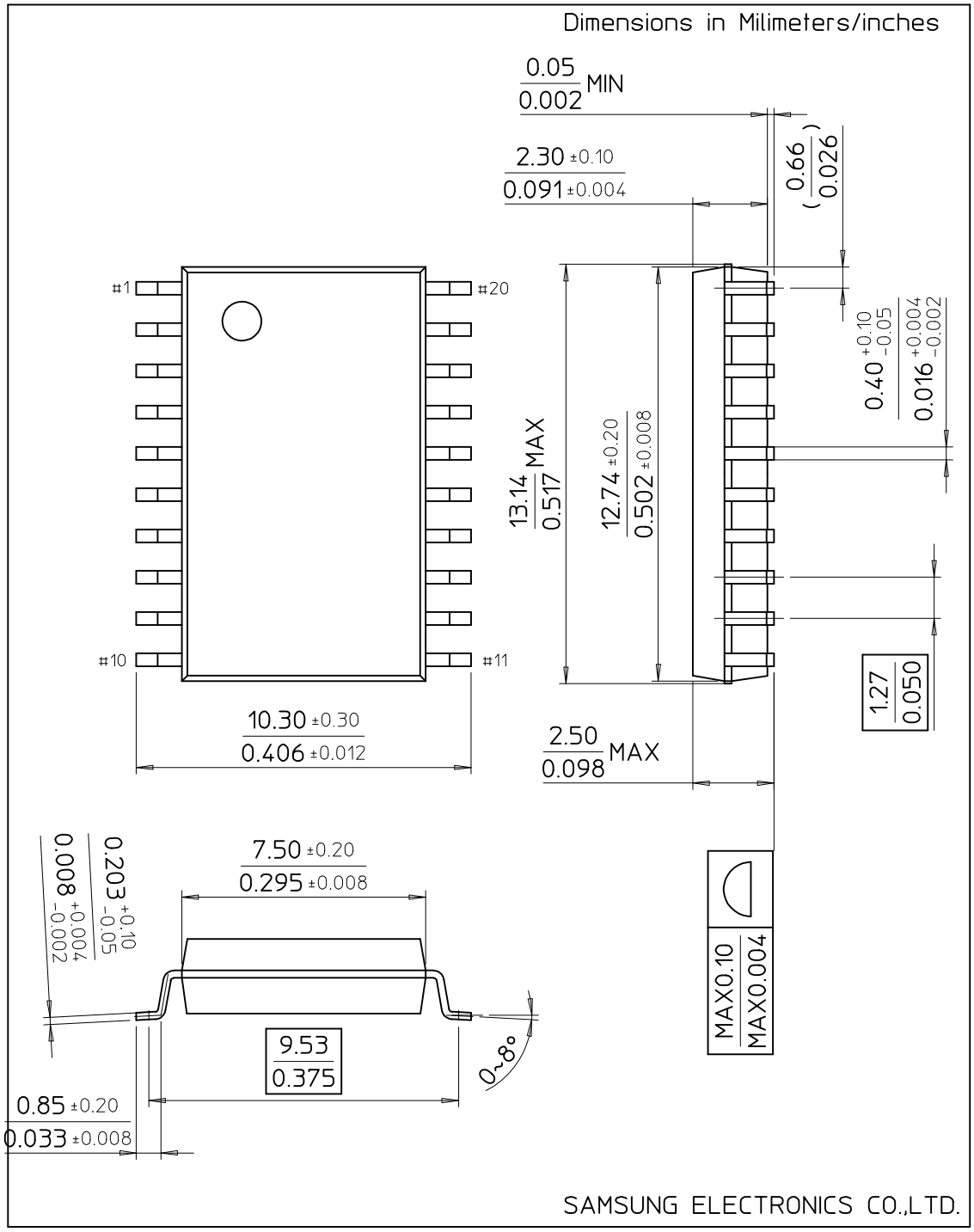
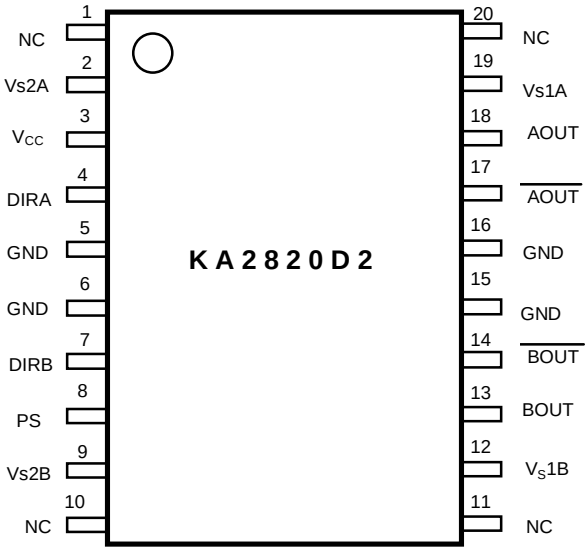

Dimensions in Milimeters/inches
0.05 / 0.002 MIN
2.30 ±0.10 / 0.091 ±0.004
(0.66 / 0.026)
#1
#20
#10
#11
13.14 / 0.517 MAX
12.74 ±0.20 / 0.502 ±0.008
0.40 +0.10 −0.05 / 0.016 +0.004 −0.002
1.27 / 0.050
10.30 ±0.30 / 0.406 ±0.012
2.50 / 0.098 MAX
0.203 +0.10 −0.05
0.008 +0.004 −0.002
7.50 ±0.20 / 0.295 ±0.008
MAX0.10 / MAX0.004
9.53 / 0.375
0~8°
0.85 ±0.20 / 0.033 ±0.008
SAMSUNG ELECTRONICS CO.,LTD.

PIN CONFIGURATION



PIN DESCRIPTION

Pin No.	Symbol	Function	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	Vs2B	B-channel holding supply voltage	B
10	NC	No connection	
11	NC	No connection	
12	Vs_{1B}	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	$\overline{GND}$	Power ground	A,B
17	AOUT	A-channel inverting output	A
18	AOUT	A-channel output	A
19	Vs1A	A-channel seeking supply voltage	A
20	NC	No connection	

ABSOLUTE MAXIMUM RATING (Ta=25℃)

Characteristics	Symbol	Value	Unit
Logic part supply voltage	V_{CC}	7.0	V
Seeking suply voltage	V_{S1}	15.0	V
Holding supply voltage	V_{S2}	7.0	V
Input voltage	V_{IN}	V_{CC}	V
Seeking output current (continuous)	I_{OS}	330	mA
Seeking output current (peak)	I_{OS} peak	500	mA
Holding output current	I_{OH}	200	mA
Package power dissipation	P_D	1.0	W
Operating temperature range	T_{OPR}	-20 to 75	℃
Storage temperature range	T_{STG}	-40 to 125	℃

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℃, V_{CC} = 5V, Vs1 = 12V, Vs2 = 5V, unless otherwise specified)

Characteristics	Symbol	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	uA
Digital input “H” current	I_{IH1}	V_{IN}=2.0V		1	10	uA
	I_{IH2}	V_{IN}=5V		0.3	1.0	mA
	IV_{CCL}	PS=0.8V		25	33	mA
	IV_{S1L}	PS=0.8V		6	10	mA
Supply current	IV_{S2L}	PS=0.8V			0.1	mA
	IV_{CCH}	PS=2.0V		25	33	mA
	IV_{S1H}	PS=2.0V		1	2	mA
	IV_{S2H}	PS=2.0V		2.5	4	mA
Output sustain voltage	V_{SUS}	I_O=10mA PS=0.8V	18			V
VS1 output saturation voltage	V_{SAT1}	I_O=330mA 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	us
	T_{PHL}	Input Pulse (2KHz)		1.0	5.0	us
TSD operating temperature	T_{SD}		125	150		℃
TSD hysterisis	$\triangle T_{SD}$			25		℃

FUNCTION DESCRIPTION

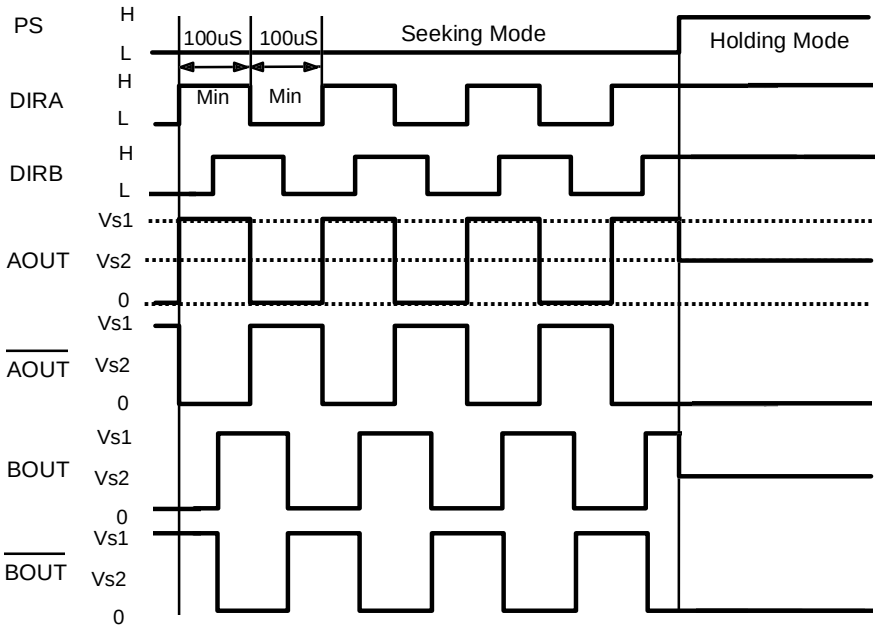
1. MOTOR CONTROL LOGIC

Mode Selection - Truth Table

Input		Output		Operating Mode	Remark
PS	DIRX	XOUT	$\overline{XOUT}$		
L	L	L	H+	Seeking Mode	H+ : Operating by Vs1 (Vs1=12V)
L	H	H+	L		
H	L	L	H-	Holding Mode	H- : Operating by Vs2 (Vs2 = 5V)
H	H	H-	L		

- DIRX : DIRA or DRIB (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)

Timing Chart



2. HOLDING and SEEKING MODE

In rotating high speed (Seeking Mode), stepping motor is operated by high voltage (Vs1 : Seeking Power Supply Voltage “12V”).
In holding mode, stepping motor is operated by low voltage (Vs2 : Holding Power Supply Voltage “5V”).
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

APPLICATION CIRCUIT