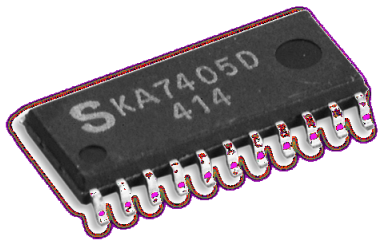
ZOOM & REEL MOTOR DRIVER

The KA7405D is a monolithic integrated circuit, and suitable for the zoom & reel motor driver for camera, tape deck, any other consumer and industrial applications.

22-SOP-300



FEATURES

- Output current up to 1.5A (Each channel).
- 4 function mode (CW, CCW, STOP and BRAKE) are controlled by 2 logic circuits.
- Operating voltage range: V_{CC} = 2.5 ~ 6.0V.
- Built-in spike killer diode.
- Low saturation voltage.

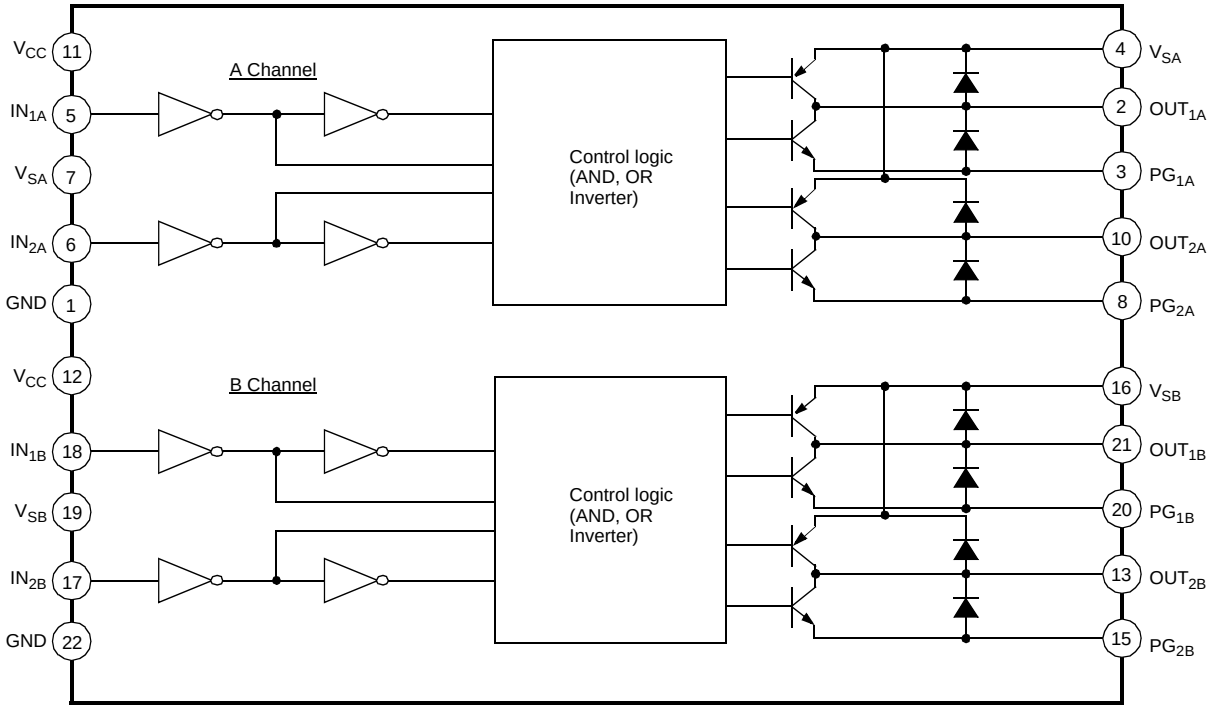
ORDERING INFORMATION

Device	Package	Operating Temperature
KA7405D	22-SOP-300	–25°C to +75°C

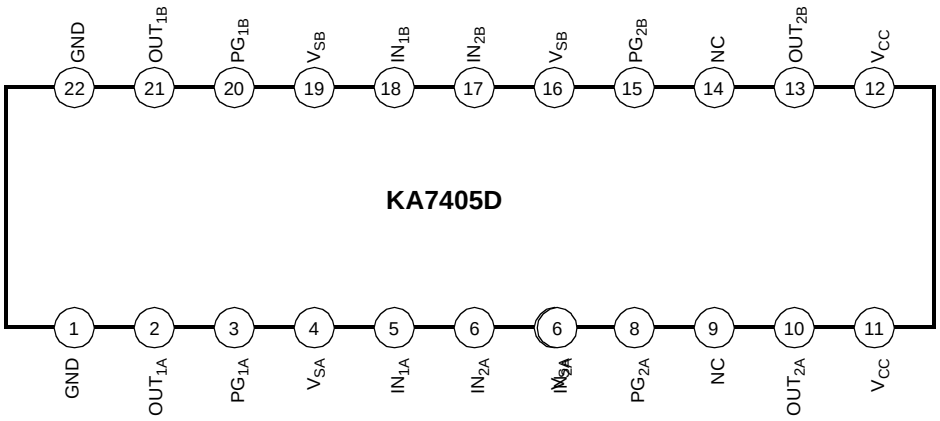
TARGET APPLICATIONS

- Film & zoom motors for camera system
- A toy or the other DC motors

BLOCK DIAGRAM



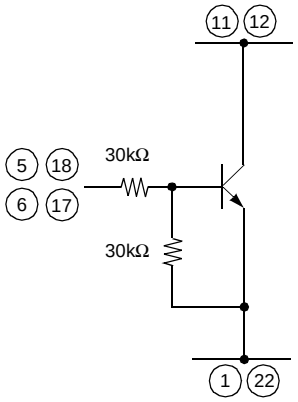
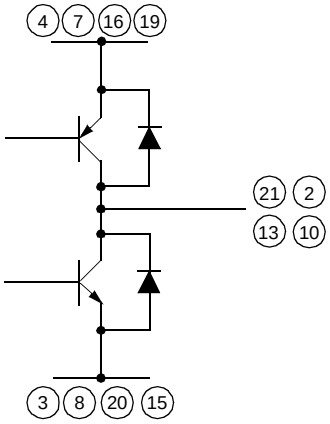
PIN CONFIGURATIONS



PIN DESCRIPTIONS

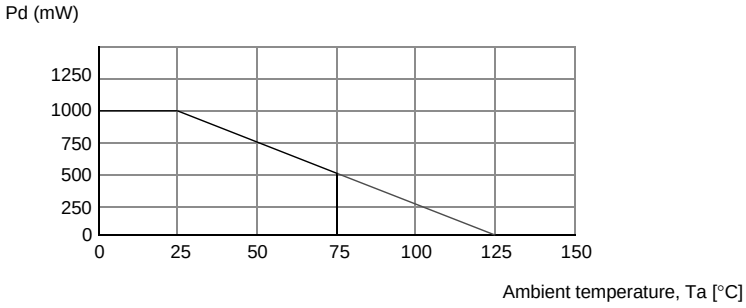
Pin No.	Symbol	I/O	Define	Remark
1	GND	–	Signal ground	–
2	OUT_{1A}	O	Output 1	Channel A
3	PG_{1A}	–	Power ground 1	Channel A
4	V_{SA}	–	Output supply voltage	Channel A
5	IN_{1A}	I	Input 1	Channel A
6	IN_{2A}	I	Input 2	Channel A
7	V_{SA}	–	Output supply voltage	Channel A
8	PG_{2A}	–	Power ground 2	Channel A
9	NC	–	No connection	–
10	OUT_{2A}	O	Output 2	–
11	V_{CC}	–	Supply voltage	–
12	V_{CC}	–	Supply voltage	–
13	OUT_{2B}	O	Output 2	Channel B
14	NC	–	No connection	–
15	PG_{2B}	–	Power ground 2	Channel B
16	V_{SB}	–	Output supply voltage	Channel B
17	IN_{2B}	I	Input 2	Channel B
18	IN_{1B}	I	Input 1	Channel B
19	V_{SB}	–	Output supply voltage	Channel B
20	PG_{1B}	–	Power ground 1	Channel B
21	OUT_{1B}	O	Output 1	Channel B
22	GND	–	Signal ground	–

EQUIVALENT CIRCUITS

Description	Pin No.	Internal Circuit
Control Input		
IN_{1A}	5	
IN_{2A}	6	
IN_{1B}	18	
IN_{2B}	17	
V_{CC}	11, 12	
GND	1, 22	
Motor Output		
OUT_{1A}	2	
OUT_{2A}	10	
OUT_{1B}	21	
OUT_{2B}	13	
V_{SA}	4, 7	
V_{SB}	16, 19	
PG_{1A}	3	
PG_{2A}	8	
PG_{1B}	20	
PG_{2B}	15	

ABSOLUTE MAXIMUM RATING (Ta=25°C)

Characteristics	Symbol	Value	Unit
Power supply voltage	V_{CCMAX}	6.0	V
Channel supply voltage	V_{SMAX}	6.0	V
Power dissipation	P_D	1000	mW
Operating temperature	T_{OPR}	–25 ~ +75	°C
Storage temperature	T_{STG}	–40 ~ +125	°C
Output current	I_{OMAX}	1.5	A



RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operating supply voltage	V_{CC}	2.5	–	6.0	V

ELECTRICAL CHARACTERISTICS

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

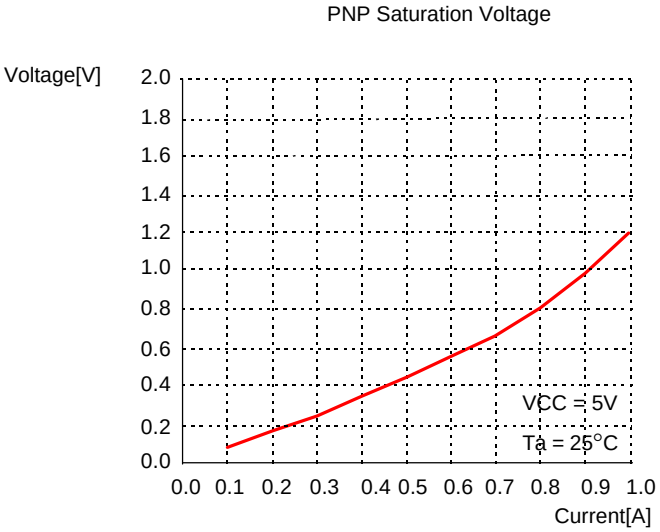
Characteristic	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Supply current 1	I_{CC1}	V_{IN}(all) = 0V	–	0.1	10	μA
Supply current 2	I_{CC2}	V_{IN1}=3V	–	15	30	mA
Supply current 3	I_{CC3}	V_{IN2}=3V	–	15	30	mA
Supply current 4	I_{CC4}	V_{IN}=3V	–	30	50	mA
Input current	I_{IN}	V_{CC}=6V, V_{IN}=2V	–	45	80	μA
Leakage current	I_{IK}	V_{CC}=7V	–	0.1	10	μA
Upper spark diode forward voltage	V_{SF1}	I_O=500mA	–	1.0	1.7	V
Lower spark diode forward voltage	V_{SF2}	I_O=500mA	–	1.0	1.7	V
Output saturation voltage (1A)	V_{O1A}	I_{OA}=300mA	–	0.45	0.70	V
Output saturation voltage (1B)	V_{O1B}	I_{OB}=300mA	–	0.45	0.70	V
Output saturation voltage (2A)	V_{O2A}	I_{OA}=600mA	–	1.0	1.5	V
Output saturation voltage (2B)	V_{O2B}	I_{OB}=600mA	–	1.0	1.5	V
Output saturation voltage (3A)	V_{O3A}	I_{OA}=300mA	–	0.45	0.70	V
Output saturation voltage (3B)	V_{O3B}	I_{OB}=300mA	–	0.45	0.70	V
Output saturation voltage (4A)	V_{O4A}	I_{OA}=600mA	–	1.0	1.5	V
Output saturation voltage (4B)	V_{O4B}	I_{OB}=600mA	–	1.0	1.5	V
Output saturation voltage 5	V_{O5}	I_{OB}=600mA	–	0.6	0.8	V
Output saturation voltage 6	V_{O6}	I_O=600mA	–	0.6	0.8	V
Output saturation voltage 7	V_{O7}	I_O=1200mA	–	1.2	1.6	V
Output saturation voltage 8	V_{O8}	I_O=1200mA	–	1.2	1.6	V
Output sustain voltage	V_{SUS}	I_O=500mA	10	15	–	V
Output saturation low voltage A note	V_{OLA}	V_{CC}=1.9V I_{OA}=400mA	–	0.45	0.70	V
Output saturation low voltage B note	V_{OLB}	V_{CC}=1.9V I_{OA}=400mA	–	0.45	0.70	V

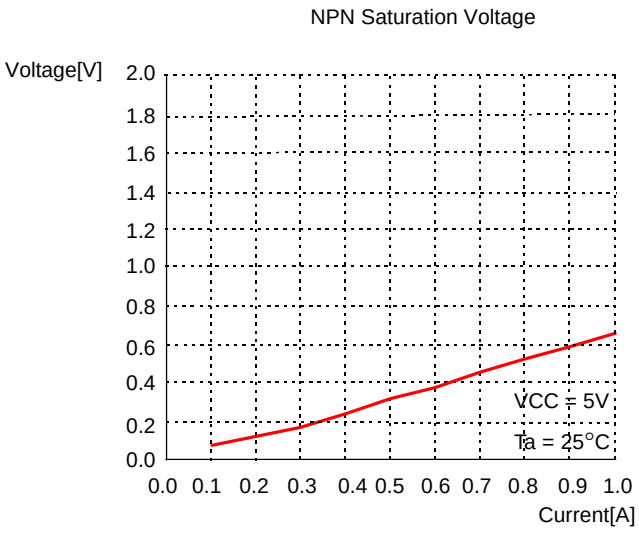
NOTE: User's option.

MOTOR OPERATION TRUTH TABLE

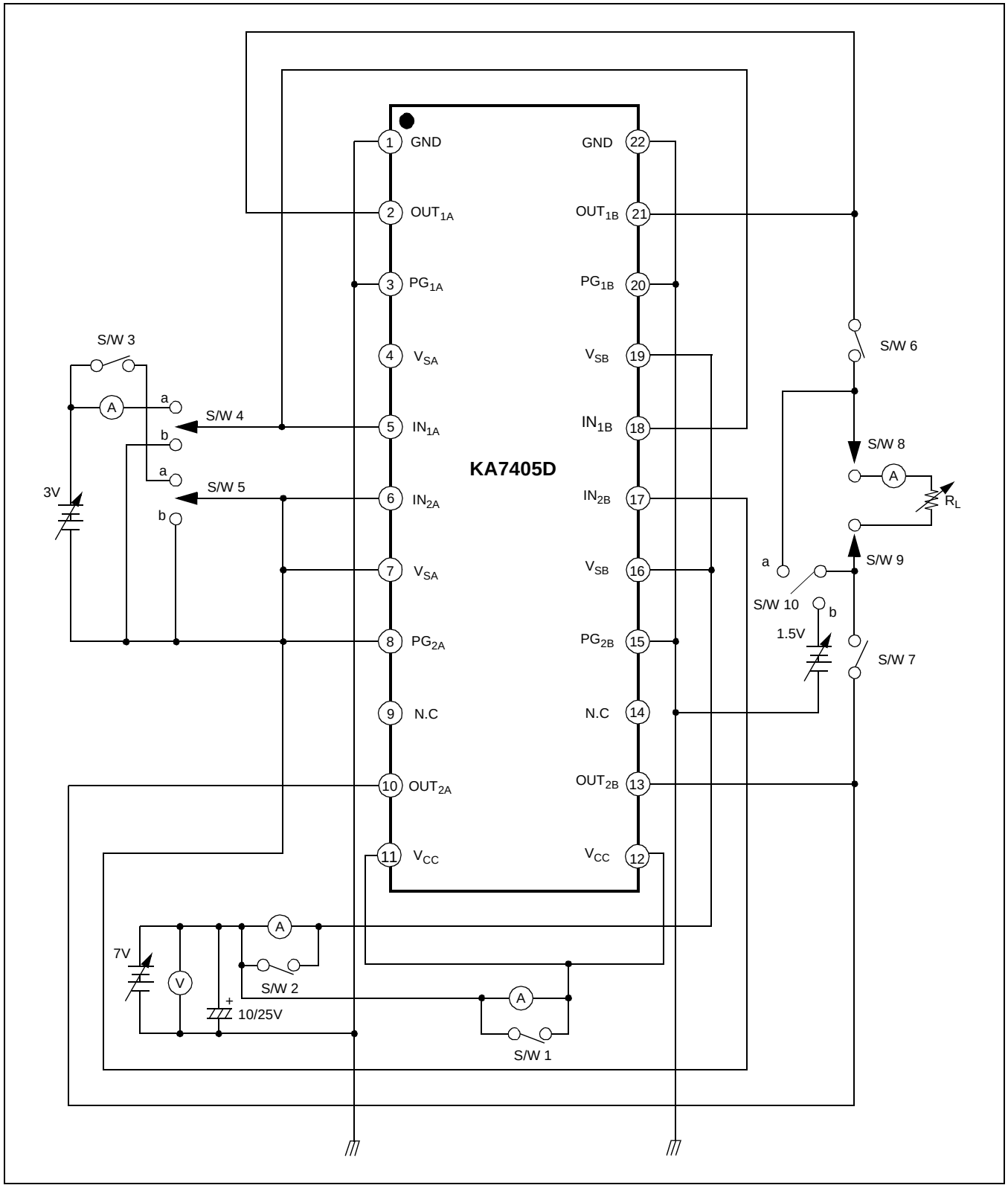
Motor Operation / Input/ Output	Input 1	Input 2	Output 1	Output 2	Remark
Stop	Low	Low	Off	Off	High impedance
Forward Operation	Low	High	Low	High	CW / CCW
Backward Operation	High	Low	High	Low	CCW / CW
Fast stop	High	High	Low	Low	Brake

ELECTRICAL CHARACTERISTICS CURVES





TEST CIRCUIT



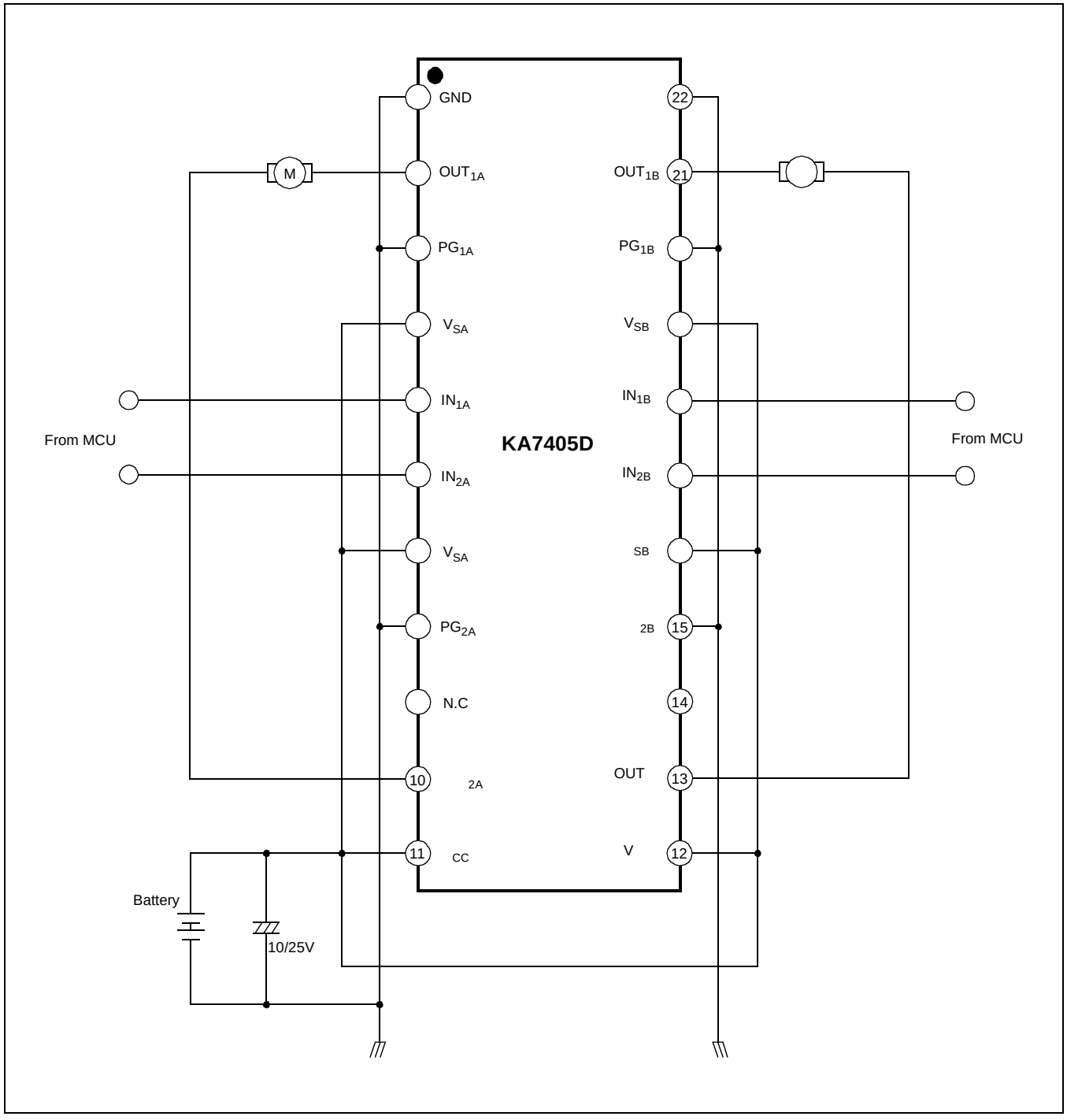
TEST CONDITIONS

Characteristics	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	Remark
I_{CC1}	Off	Off	X	b	b	Off	Off	X	X	Off	Supply current
I_{CC2}	Off	Off	On	a	b	Off	Off	X	X	Off	Supply current
I_{CC3}	Off	Off	On	b	a	Off	Off	X	X	Off	Supply current
I_{CC4}	Off	Off	On	a	a	Off	Off	X	X	Off	Supply current
I_{IN}	On	On	On	a	a	Off	Off	X	X	Off	Input current
I_{IK}	Off	Off	Off	b	b	Off	Off	X	X	Off	Leakage current
V_{SF1}	On	On	On	a	b	On	On	Off	Off	a	Spark diode
V_{SF2}	On	On	On	b	a	On	On	Off	Off	b	Spark diode
V_{O1A}	On	On	On	a	b	On	On	On	On	Off	Single mode
V_{O2A}	On	On	On	b	a	On	On	On	On	Off	Single mode
V_{O3A}	On	On	On	a	b	On	On	On	On	Off	Single mode
V_{O4A}	On	On	On	b	a	On	On	On	On	Off	Single mode
V_{O5}	On	On	On	a	b	On	On	On	On	Off	Parallel mode
V_{O6}	On	On	On	b	a	On	On	On	On	Off	Parallel mode
V_{O7}	On	On	On	a	b	On	On	On	On	Off	Parallel mode
V_{O8}	On	On	On	b	a	On	On	On	On	Off	Parallel mode
V_{SUS}	Off	Off	X	b	b	On	On	On	On	Off	Sustain voltage

NOTE: ‘ X ’ : Don’t care.

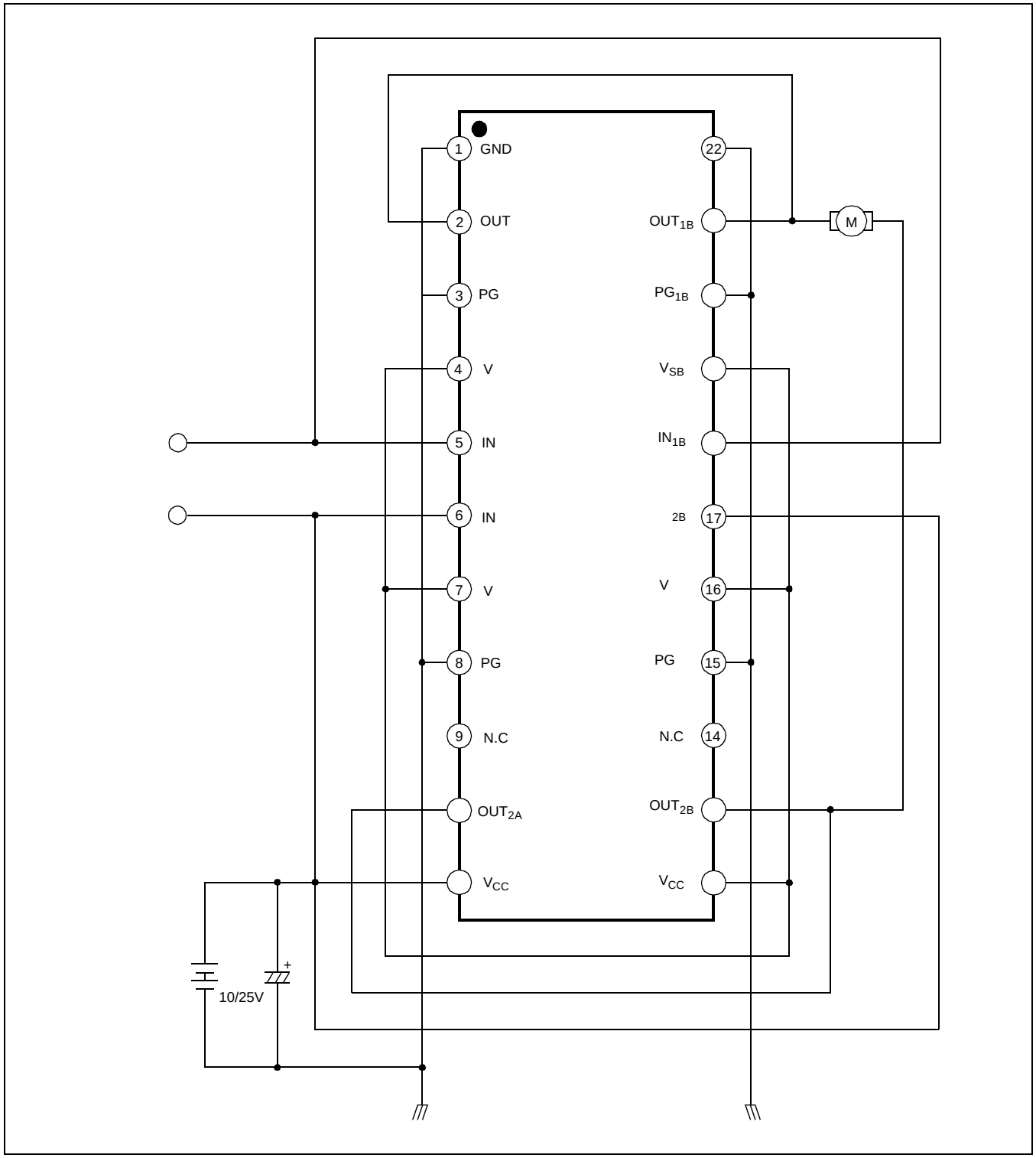
APPLICATION CIRCUIT 1

(Single drive mode)



APPLICATION CIRCUIT 2

(Parallel drive mode)



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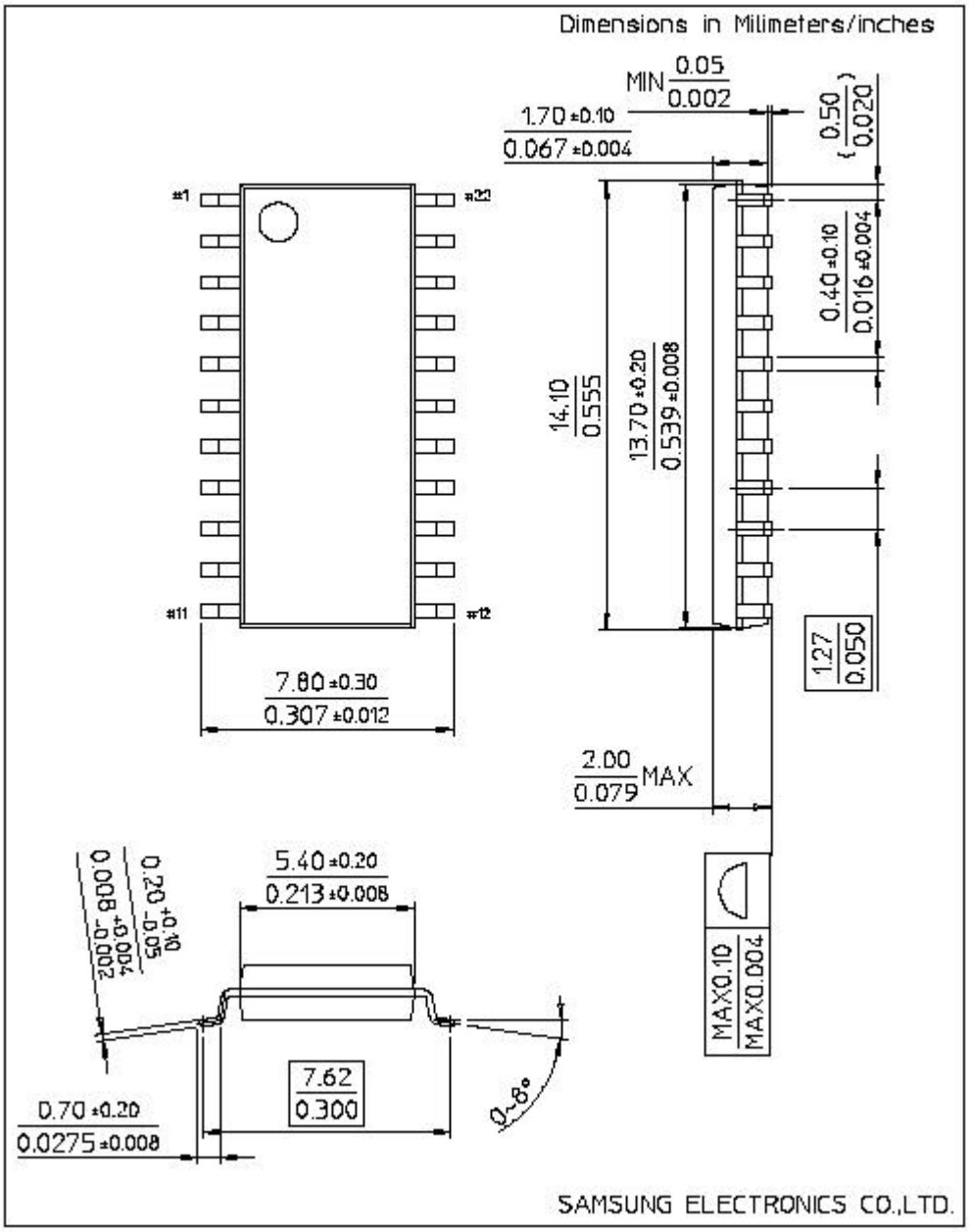
Dimensions in Milimeters/inches
MIN 0.05 / 0.002
1.70 ±0.10 / 0.067 ±0.004
0.50 / 0.020
#1
#23
#11
#12
0.40 ±0.10 / 0.016 ±0.004
14.10 / 0.555
13.70 ±0.20 / 0.539 ±0.008
7.80 ±0.30 / 0.307 ±0.012
1.27 / 0.050
2.00 / 0.079 MAX
5.40 ±0.20 / 0.213 ±0.008
0.20 +0.10 -0.05 / 0.008 +0.004 -0.002
MAX0.10 / MAX0.004
7.62 / 0.300
0.70 ±0.20 / 0.0275 ±0.008
0~8°
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