SHINDENGEN
ELECTRIC MFG. CO., LTD.

MTD2006G

Dual Full-bridge
PWM Stepper Motor Driver

Features

Dual full bridge for a bipolar stepper motor driver
Out put current 1.3A , Output Voltage 35V
Constant current control (Fixed frequency PWM control)
Built-in flywheel and flyback diodes)
Noise cancellation function
Current decay mode (Fast decay or Slow decay)
Cross conduction protection
Overheating alarm
Surface mount type package with heat sink HSOP24)

HSOP24
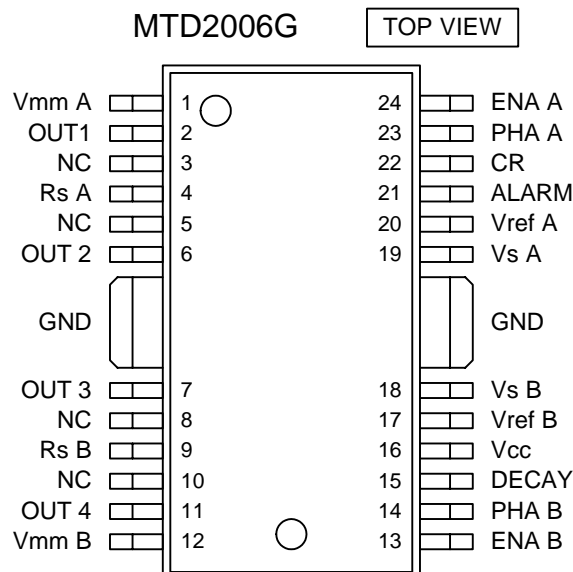
Absolute maximum ratings / Ta=25

Parameter	Symbol	Rating	Unit
Output voltage	Vmm	35	V
Output current	I_{OUT}	1.3	A
Logic supply	Vcc	0　6	V
Logic input	V_{LOGIC}	0　Vcc	V
Puwer dissipation *	P_D	2.1	W
Storage temperature range	Tstg	-40　150	
Maximum Junction temperature	Tj	150	

*50.8× 50.8× 1mm³ Glass Epoxy Board(FR4),200mm² Cupper Pattern

Pin Assignment

MTD2006G   TOP VIEW

Vmm A	1 ○	24　ENA A
OUT1	2	23　PHA A
NC	3	22　CR
Rs A	4	21　ALARM
NC	5	20　Vref A
OUT 2	6	19　Vs A
GND		GND
OUT 3	7	18　Vs B
NC	8	17　Vref B
Rs B	9	16　Vcc
NC	10	15　DECAY
OUT 4	11	14　PHA B
Vmm B	12	13　ENA B

Truth table

ENA A or B	PHA A or B	OUT 1 or 4	OUT 2 or 3
L	L	L	H
L	H	H	L
H		OFF	OFF

　don't care

DECAY	Current Decay Mode
L	Fast
H	Slow

Electrical Characteristics

Va=25 ,Vcc=5V unless otherwise specified

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Load supply current (2circuit OFF)	Imm(OFF)	V_{ENA}=5V , Vmm=35V	-	-	8	A
Upper transistor saturation voltage	$V_{CE(SAT)}H$	Ic=0.8A	-	1.0	1.4	V
Lower transistor saturation voltage	$V_{CE(SAT)}L$	Ic=0.8A	-	1.0	1.4	V
Upper transistor leak current	IrH	Vmm=35V , V_{OUT}=0V	-	-	10	μA
Lower transistor leak current	IrL	V_{OUT}=35V , V_{RS}=0V	-	-	10	μA
Upper diode forward drop	$V_F H$	I_F=0.8A	-	1.3	1.6	V
Lower diode forward drop	$V_F L$	IF=0.8A	-	1.3	1.5	V
Logic supply current(2circuit ON)	Icc(ON)	V_{ENA}=0V	-	25	33	A
Logic supply current(2circuit OFF)	Icc(OFF)	V_{ENA}=5V	-	19	26	A
PHA/ENA/DECAY "H" input voltage	$V_{PHA/ENA/DEC}H$		2.3	-	Vcc	V
PHA/ENA/DECAY "L" input voltage	$V_{PHA/ENA/DEC}L$		GND	-	0.8	V
PHA/ENA/DECAY"H"input current	$I_{PHA/ENA/DEC}H$	$V_{PHA/ENA/DEC}$=5V	-	-	10	μA
PHA/ENA"L"input current	$I_{PHA/ENA}L$	$V_{PHA/ENA}$=0V	-	-100	-150	μA
DECAY"L"input current	$I_{DEC}L$	V_{DEC}=0V	-	-200	-300	μA
Vref input current	Iref	Vref=0V	-	-1	-10	μA
Vs input current	Is	Vs=0V	-	-1	-10	μA
Comparator threshold	Vs	Vref=0.5V	0.475	0.5	0.525	V
Chopping frequency	f_{CHOP}	Ct=3300pF,Rt=20k	-	20	-	kHz
Blanking time	tb	Ct=3300pF,Rt=20k	-	1.35	-	μs
Vs maximum voltage	Vs(max)		-	-	1.0	V
Alarm leakage current	Ir(alm)	Valm=5V	-	-	10	μA
Alarm pin sink current	Ialm	Valm=0.5V	-	-	2	A
Thermal alarm operating temperature	T_{ALM}		-	140	-	

Recommended operation conditions

Parameter	Symbol	Recommendation	Unit
Junction temperature range	Tj	-25 120	
Logic supply	Vcc	4.75 5.25	V
Load supply	Vmm	-5 31	V

Thermal resistance

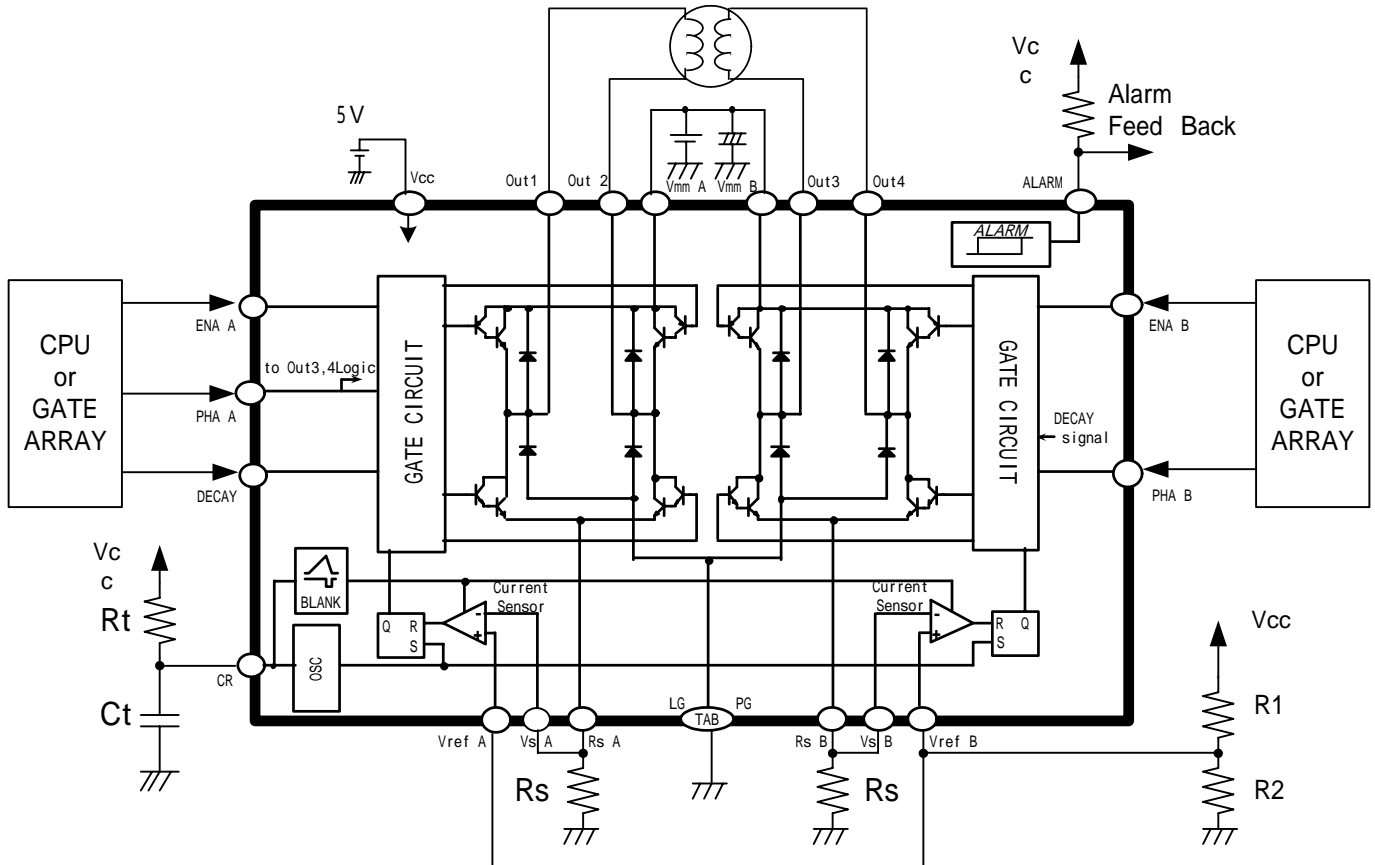| Symbol	Rating	Unit
ja	58	/W

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Typical Application

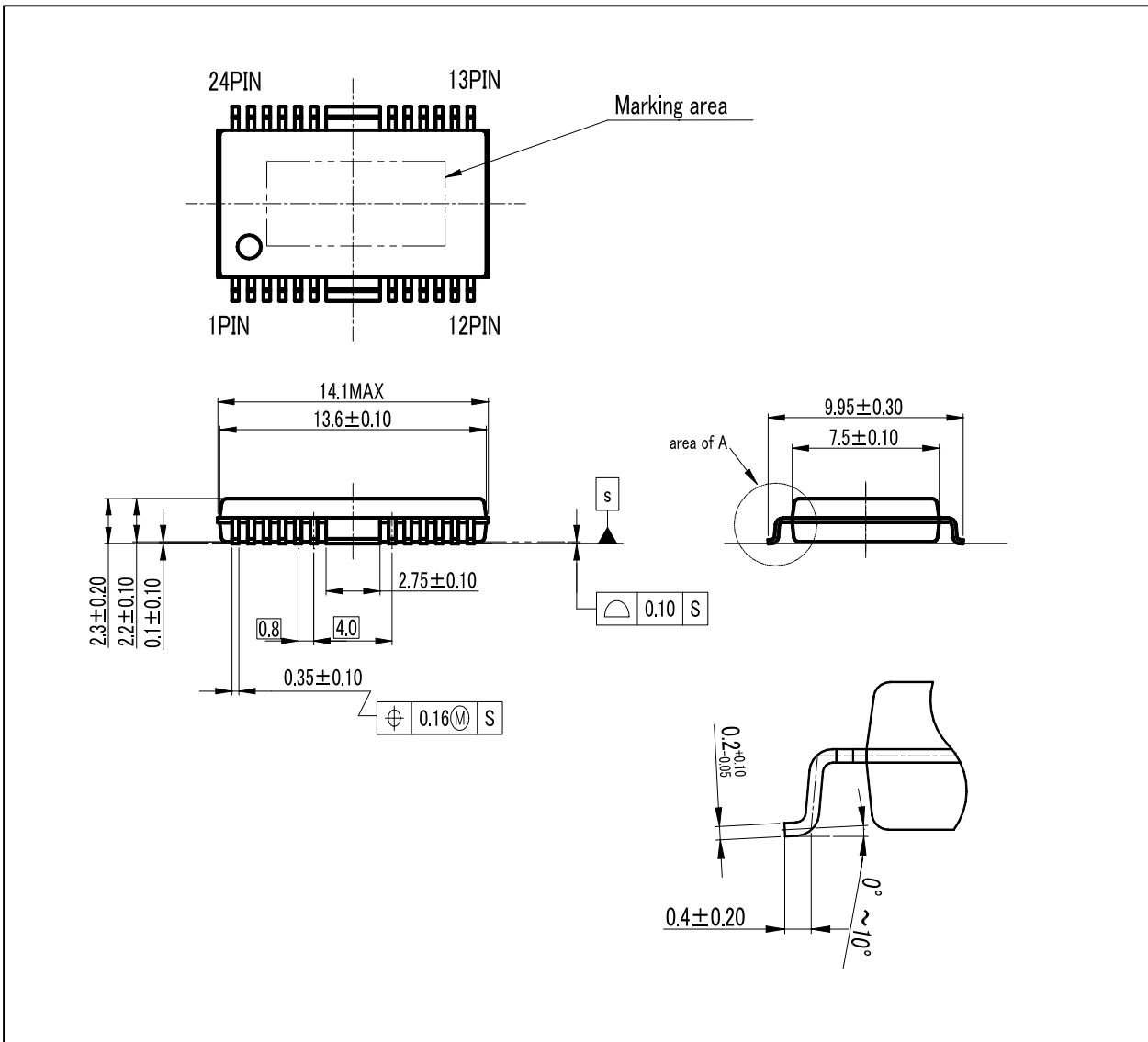**Constant chopping current level**

$$Ichop = \frac{Vref}{Rs}$$

Chopping frequency

$$f \approx \frac{1}{0.75 \ Ct \ Rt}$$

Recommended component values

Rt 7.5 ~ 30k
Ct 2200 ~ 4700pF
R1+R2 ~ 10k

Outline Drawing

24PIN　　　　　　13PIN

Marking area

1PIN　　　　　　12PIN

14.1MAX
13.6±0.10

9.95±0.30
7.5±0.10

area of A

S

2.3±0.20
2.2±0.10
0.1±0.10

2.75±0.10

0.8　　4.0

0.35±0.10

△ 0.10 S

⊕ 0.16Ⓜ S

0.2 +0.10 −0.05

0.4±0.20

0°～10°

(Unit : mm)

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