

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)

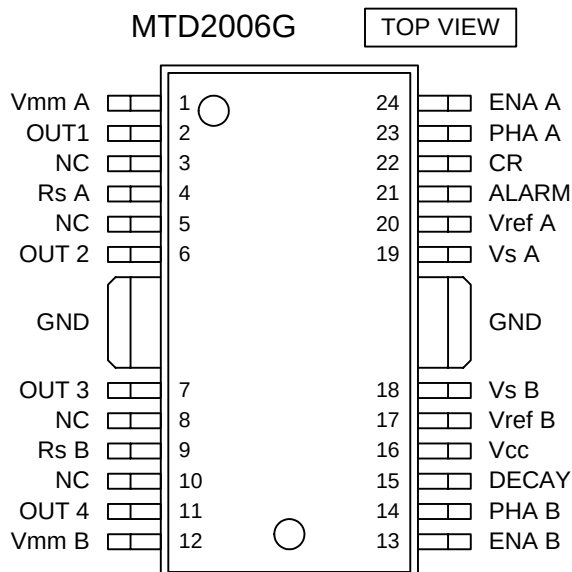


Absolute maximum ratings / Ta=25°C

Parameter	Symbol	Rating	Unit
Output voltage	V _{mm}	35	V
Output current	I _{OUT}	1.3	A
Logic supply	V _{cc}	0~6	V
Logic input	V _{LOGIC}	0~V _{cc}	V
Puwer dissipation *	P _D	2.1	W
Storage temperature range	T _{stg}	-40~150	°C
Maximum Junction temperature	T _j	150	°C

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

Pin Assignment



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

Stepper Motor Driver IC

MTD2006G

Electrical Characteristics

V_a=25°C ,V_{cc}=5V unless otherwise specified

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Load supply current (2circuit OFF)	Imm(OFF)	V _{ENA} =5V , V _{mm} =35V	-	-	8	mA
Upper transistor saturation voltage	V _{CE(SAT)} H	I _c =0.8A	-	1.0	1.4	V
Lower transistor saturation voltage	V _{CE(SAT)} L	I _c =0.8A	-	1.0	1.4	V
Upper transistor leak current	I _{rH}	V _{mm} =35V , V _{OUT} =0V	-	-	10	μA
Lower transistor leak current	I _{rL}	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	I _F =0.8A	-	1.3	1.5	V
Logic supply current(2circuit ON)	I _{cc} (ON)	V _{ENA} =0V	-	25	33	mA
Logic supply current(2circuit OFF)	I _{cc} (OFF)	V _{ENA} =5V	-	19	26	mA
PHA/ENA/DECAY "H" input voltage	V _{PHA/ENA/DEC} H		2.3	-	V _{cc}	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	I _{ref}	V _{ref} =0V	-	-1	-10	μA
Vs input current	I _s	V _s =0V	-	-1	-10	μA
Comparator threshold	V _s	V _{ref} =0.5V	0.475	0.5	0.525	V
Chopping frequency	f _{CHOP}	C _t =3300pF,R _t =20kΩ	-	20	-	kHz
Blanking time	t _b	C _t =3300pF,R _t =20kΩ	-	1.35	-	μs
Vs maximum voltage	V _s (max)		-	-	1.0	V
Alarm leakage current	I _r (alm)	V _{alm} =5V	-	-	10	μA
Alarm pin sink current	I _{alm}	V _{alm} =0.5V	-	-	2	mA
Thermal alarm operating temperature	T _{ALM}		-	140	-	°C

Recommended operation conditions

Parameter	Symbol	Recommendation	Unit
Junction temperature range	T _j	-25~120	°C
Logic supply	V _{cc}	4.75~5.25	V
Load supply	V _{mm}	-5~31	V

Thermal resistance

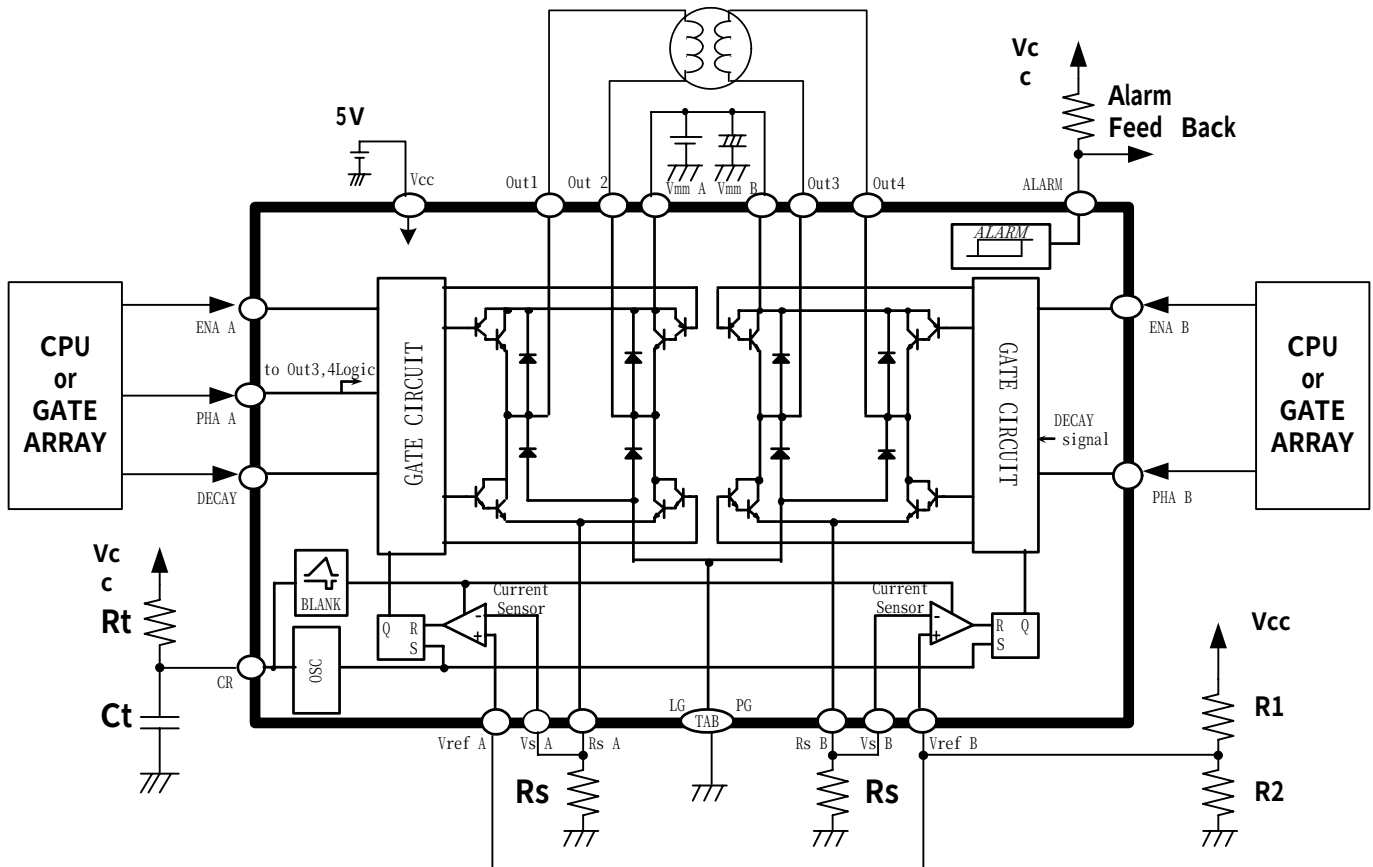
Symbol	Rating	Unit
θ _{ja}	58	°C/W

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

Stepper Motor Driver IC

MTD2006G

Typical Application



●Constant chopping current level

$$I_{chop} = \frac{V_{ref}}{R_s}$$

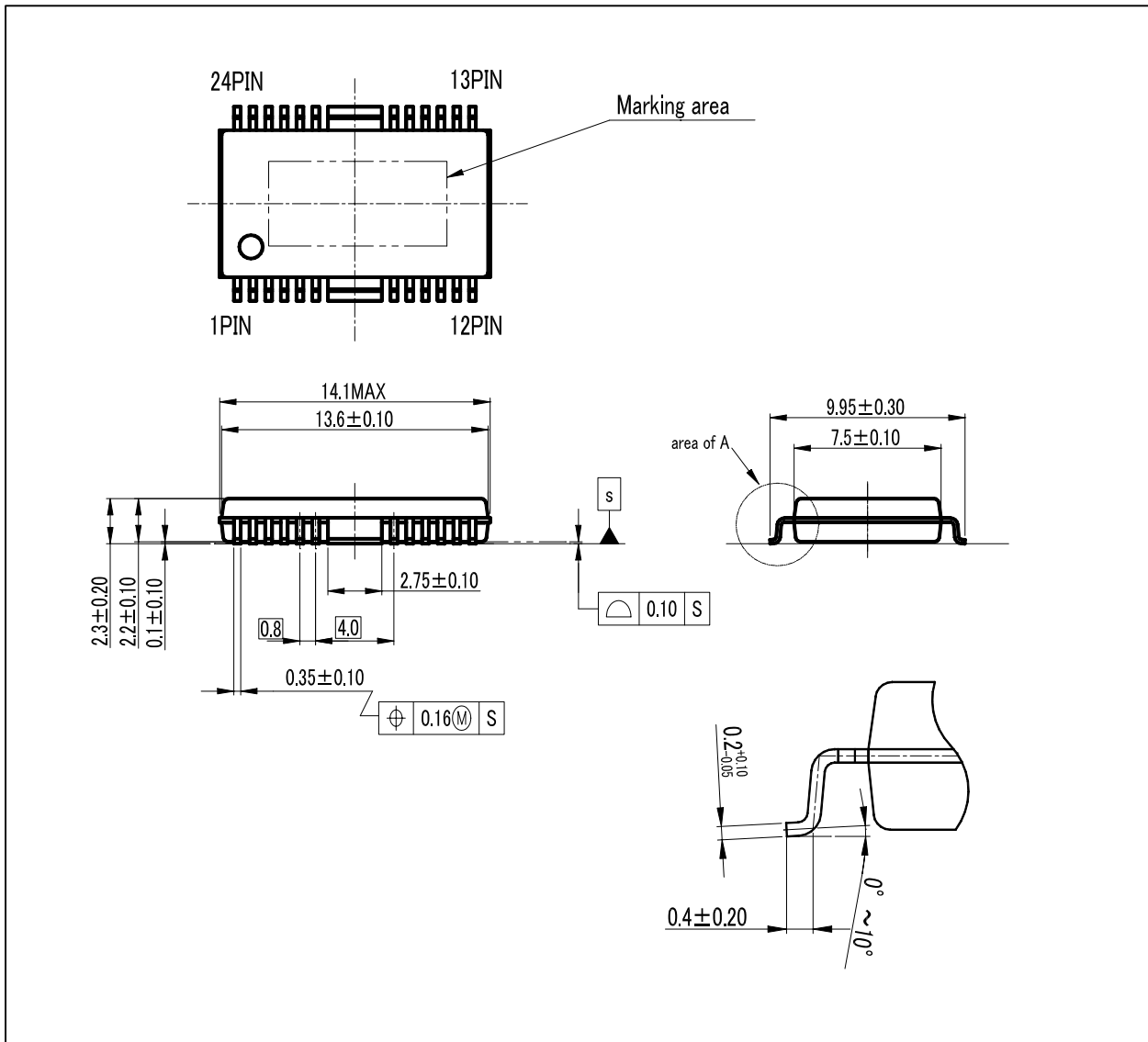
●Chopping frequency

$$f = \frac{1}{0.75 \cdot C_t \cdot R_t}$$

●Recommended component values

R_t 7.5~30k Ω
 C_t 2200~4700pF
 $R_1 + R_2 \leq 10k\Omega$

■ Outline Drawing



(Unit : mm)

⚠ Although we are constantly making every effort to improve the quality and reliability of our products, there nevertheless remains a certain probability that the semiconductor products may occasionally fail or malfunction. Please take careful precautions against product failures or malfunctions to avoid any injuries, fire accidents or social loss by implementing safety designs such as redundancy designs, designs for fire spread prevention, and designs for preventing malfunctions.

⚠ Our semiconductor products listed in this document are not designed or manufactured to be used in devices or systems requiring extremely high levels of quality and reliability, or the failure or malfunction of which may directly threaten human lives or cause injury. In the cases where the products are to be used in devices or systems for special applications or devices or systems for specialized applications shown below, always make sure to consult us in advance.

Special Applications

Transportation devices (automotive, marine, etc.), communication devices for core network, traffic signal devices, fire prevention/anticrime devices, various safety devices, medical devices, etc.

Specialized Applications

Nuclear power control systems, aircraft and aerospace devices, submarine relay devices, and systems for preserving life, etc.

Even if it is not for a special or specialized application, when IC products are to be used for devices or systems that are desired to last for a long period under continuous operation, please make sure to consult our sales representative in advance.

- We reserve the right to make any changes to the contents of this manual without prior notice in accordance with modifications to IC products.
- Details of specifications should be exchanged at the adoption of the IC products.
- All information included in this manual is believed to be accurate and reliable. However, our company takes no responsibility for any injury or damage incurred when using the IC products as described in this manual. Neither do we take any responsibility for issues arising from infringement of patent or other rights caused by using this manual.
- The provision of this manual does not guarantee the right to use any third party's patent or other rights, or grant permission to use the patent or other rights of our company.
- No part of this manual may be reproduced or copied without the specific written consent of Shindengen Electric Mfg. Co., Ltd.