

# MTD2017G

## Dual Full-bridge Microstepping PWM Motor Driver

### Features

- Dual full bridge for a bipolar stepper motor driver
- Load supply voltage 35V , Output current 0.8A
- Constant current control (Fixed OFF time PWM control)
- 2-bit selectable current level (Full step/Half step/Quarter step)
- Stand-by function
- Built-in flywheel and flyback diodes
- Under voltage lock out function
- Thermal shutdown with hysteresis
- Surface mount package with heat sink(HSOP24)

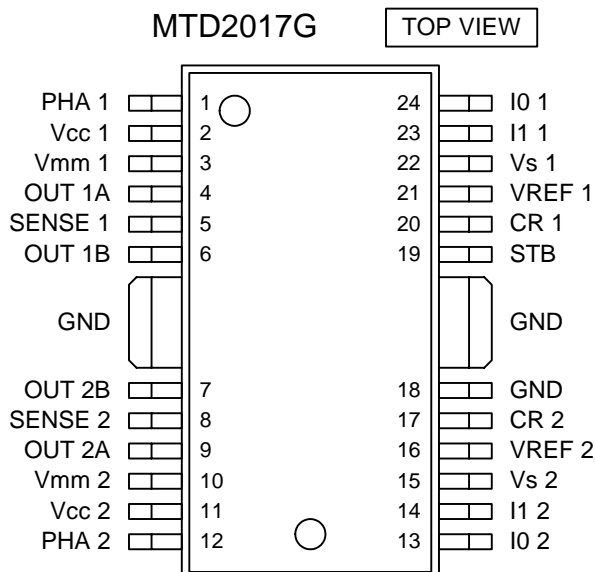


Absolute maximum ratings / Ta=25

Parameter	Symbol	Rating	Unit
Output voltage	V <sub>mm</sub>	35	V
Output current	I <sub>OUT</sub>	0.8	A
Logic supply	V <sub>CC</sub>	0 ~ 6	V
Logic input	V <sub>LOGIC</sub>	0 ~ V <sub>CC</sub>	V
Power dissipation	P <sub>T</sub> *1	2.1	W
Storage temperature range	T <sub>stg</sub>	-40 ~ 150	
Maximum Junction temperature	T <sub>j</sub>	150	

\*1 : 50.8 × 50.8 × 1mm<sup>3</sup> Glass Epoxy Board(FR4),200mm<sup>2</sup> Copper Pattern

### Pin Assignment



### Truth table

PHA 1 or 2	OUT A	OUT B
L	L	H
H	H	L

I0	I1	Output current ratio[%]	Vr[V] (at VREF=5V)
L	L	100	0.500 ± 5%
H	L	67	0.335 ± 8%
L	H	33	0.165 ± 10%
H	H	0	-

STB	Mode
L	stand by
H	active

**Electrical Characteristics**

Ta=25 unless otherwise specified

item	symbol	condition	MIN	TYP	MAX	unit
Logic supply current (2circuit ON)	I <sub>cc(ON)</sub>	V <sub>cc</sub> =5V	-	50.0	62.0	mA
Logic supply current (2circuit OFF)	I <sub>cc(OFF)</sub>	V <sub>cc</sub> =5V,I <sub>0</sub> =I <sub>1</sub> =H	-	17.0	21.0	mA
Load supply current (2circuit OFF)	I <sub>mm(OFF)</sub>	V <sub>cc</sub> =5V,V <sub>mm</sub> =35V,I <sub>0</sub> =I <sub>1</sub> =H	-	5.0	7.4	mA
Logic supply current(STB)	I <sub>cc(STB)</sub>	V <sub>cc</sub> =5V,STB=L	-	3.5	4.7	mA
Load supply current(STB)	I <sub>mm(STB)</sub>	V <sub>cc</sub> =5V,V <sub>mm</sub> =35V,STB=L	-	-	10.0	μA
PHA“H”input voltage	V <sub>PHA H</sub>	V <sub>cc</sub> =5V	2.0	-	V <sub>cc</sub>	V
PHA“L”input voltage	V <sub>PHA L</sub>	V <sub>cc</sub> =5V	GND	-	0.8	V
PHA“H”input current	I <sub>PHA H</sub>	V <sub>cc</sub> =5V,V <sub>PHA</sub> =5V	-	-	10.0	μA
PHA“L”input current	I <sub>PHA L</sub>	V <sub>cc</sub> =5V,V <sub>PHA</sub> =0V	-	-1.0	-10.0	μA
I <sub>0</sub> ,I <sub>1</sub> “H”input voltage	V(I <sub>0</sub> ,I <sub>1</sub> ) H	V <sub>cc</sub> =5V,V <sub>mm</sub> =12V	2.0	-	V <sub>cc</sub>	V
I <sub>0</sub> ,I <sub>1</sub> “L”input voltage	V(I <sub>0</sub> ,I <sub>1</sub> ) L	V <sub>cc</sub> =5V,V <sub>mm</sub> =12V	GND	-	0.8	V
I <sub>0</sub> ,I <sub>1</sub> “H”input current	I(I <sub>0</sub> ,I <sub>1</sub> ) H	V <sub>cc</sub> =5V,V(I <sub>0</sub> ,I <sub>1</sub> )=5V	-	-	10.0	μA
I <sub>0</sub> ,I <sub>1</sub> “L”input current	I(I <sub>0</sub> ,I <sub>1</sub> ) L	V <sub>cc</sub> =5V,V(I <sub>0</sub> ,I <sub>1</sub> )=0V	-	-2.0	-30.0	μA
STB“H”input voltage	V <sub>STB H</sub>	V <sub>cc</sub> =5V	2.0	-	V <sub>cc</sub>	-
STB“L”input voltage	V <sub>STB L</sub>	V <sub>cc</sub> =5V	GND	-	0.8	-
V <sub>ref</sub> input voltage	V <sub>REF</sub>	-	1.0	-	7.5	V
V <sub>ref</sub> input current	I <sub>REF</sub>	V <sub>cc</sub> =5V,V <sub>REF</sub> =0V	-1	-	10.0	μA
V <sub>s</sub> input current	I <sub>s</sub>	V <sub>cc</sub> =5V,V <sub>s</sub> =0V	-1	-	10.0	μA
comparator threshold(100%)	V <sub>s1</sub>	V <sub>cc</sub> =V <sub>REF</sub> =5V,I <sub>0</sub> =L,I <sub>1</sub> =L	0.475	0.500	0.525	V
comparator threshold(67%)	V <sub>s2</sub>	V <sub>cc</sub> =V <sub>REF</sub> =5V,I <sub>0</sub> =H,I <sub>1</sub> =L	0.308	0.335	0.362	V
comparator threshold(33%)	V <sub>s3</sub>	V <sub>cc</sub> =V <sub>REF</sub> =5V,I <sub>0</sub> =L,I <sub>1</sub> =H	0.140	0.165	0.182	V
Upper transistor saturation drop	V <sub>ce(SAT)H</sub>	I <sub>c</sub> =0.8A	-	1.20	1.40	V
Lower transistor saturation drop	V <sub>ce(SAT)L</sub>	I <sub>c</sub> =0.8A	-	0.70	1.00	V
Output leak current	I <sub>r</sub>	V <sub>mm</sub> =V <sub>ce(sus)</sub> V,V <sub>out</sub> =0V	-	-	10.0	μA
Upper diode forward drop	V <sub>F H</sub>	I <sub>f</sub> =0.8A	-	1.30	1.50	V
Lower diode forward drop	V <sub>F L</sub>	I <sub>f</sub> =0.8A	-	1.40	1.60	V
One Shot OFF time	T <sub>OFF</sub>	C <sub>t</sub> =3300pF,R <sub>t</sub> =4.7K	-	17.1	-	μS
UVLO threshold	V <sub>uv</sub>	-	-	4.0	-	V
Thermal shutdown temperature	T <sub>JTSD</sub>	-	-	170	-	

**Recommended operation conditions**

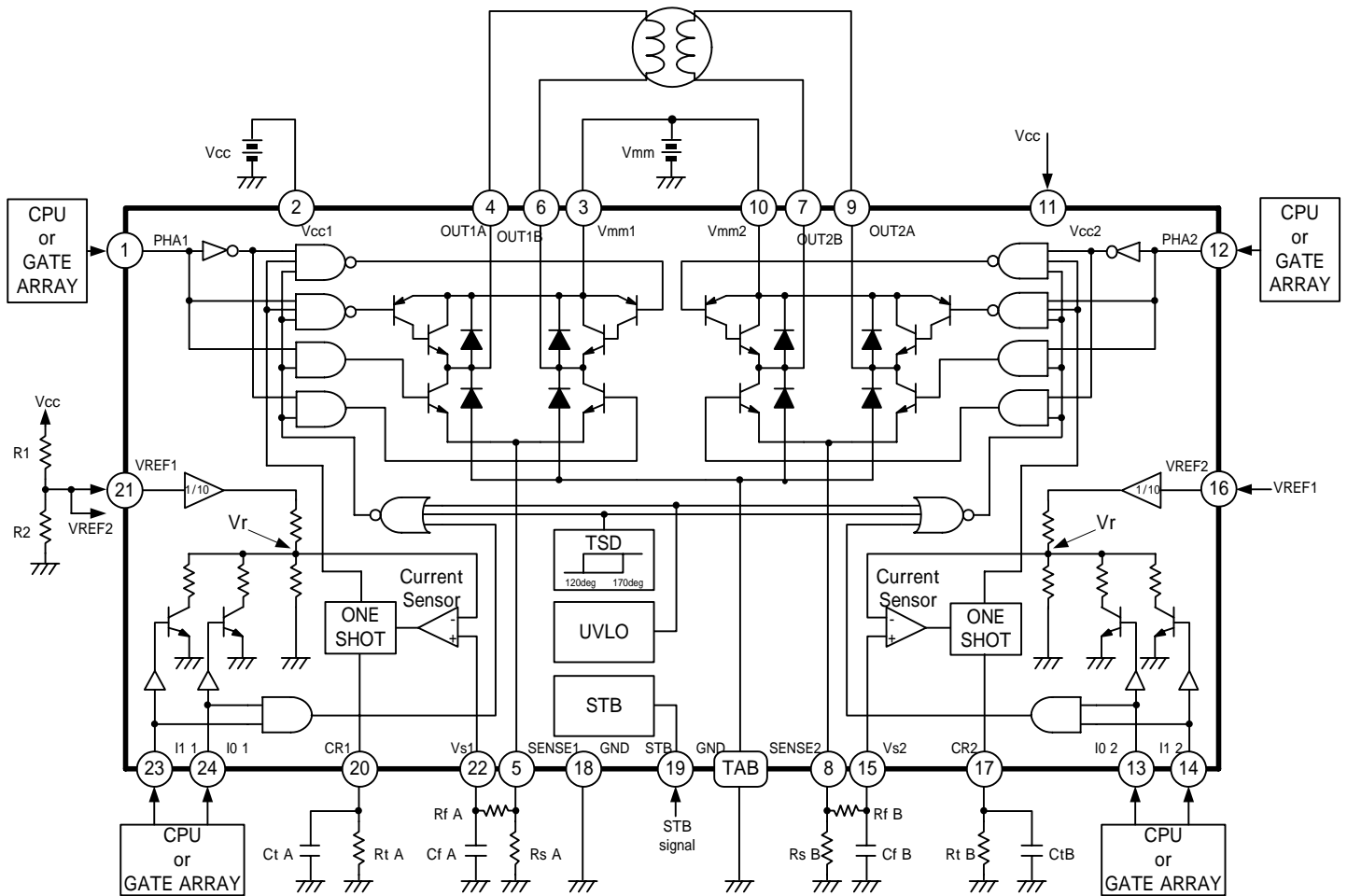
Parameter	Symbol	Recommendation	Unit
Junction temperature	T <sub>J</sub>	-25 ~ 120	
Logic supply	V <sub>cc</sub>	4.5 ~ 5.5	V
Load supply	V <sub>mm</sub>	10 ~ 27	V

**Thermal resistance**

Symbol	Rating	Unit
ja *	58	/W

 \* 50.8 × 50.8 × 1mm<sup>3</sup> Glass Epoxy Board(FR4),200mm<sup>2</sup> Copper Pattern

## Block diagram / Typical application



### Constant chopping current level

$$I_{chop} = \frac{VREF}{10R_s} - 0.015$$

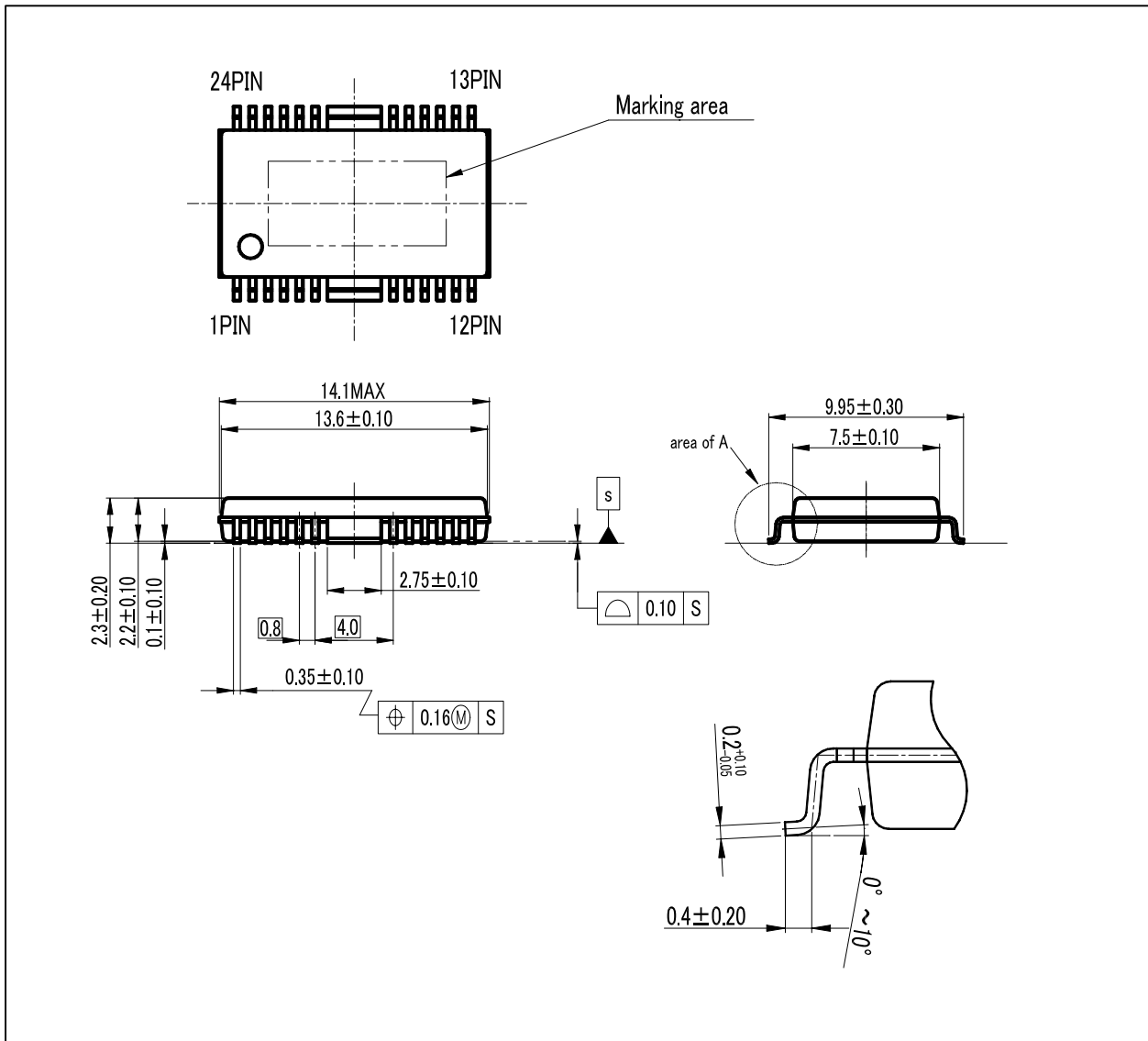
### ONE SHOT OFF TIME

$$T_{off} = 1.1C_tR_t$$


### Recommended component values


Symbol	Recommended component values	Unit
Ct	3300	pF
Rt	4.7	k
Cf	820	pF
Rf	1.0	k

Outline Drawing



(Unit : mm)

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