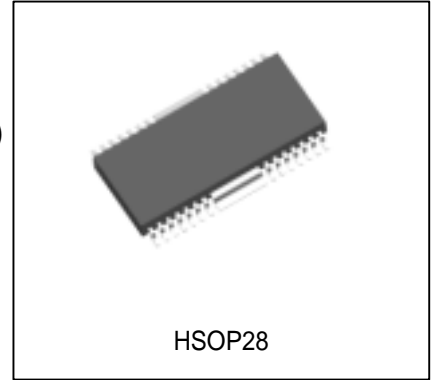


# MTD2018F

## 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)
- Logic supply 3.3V only
- Stand-by function
- Built-in flywheel and flyback diodes
- Under voltage lock out function
- Thermal shutdown with hysteresis
- Surface mount package with heat sink(HSOP28)

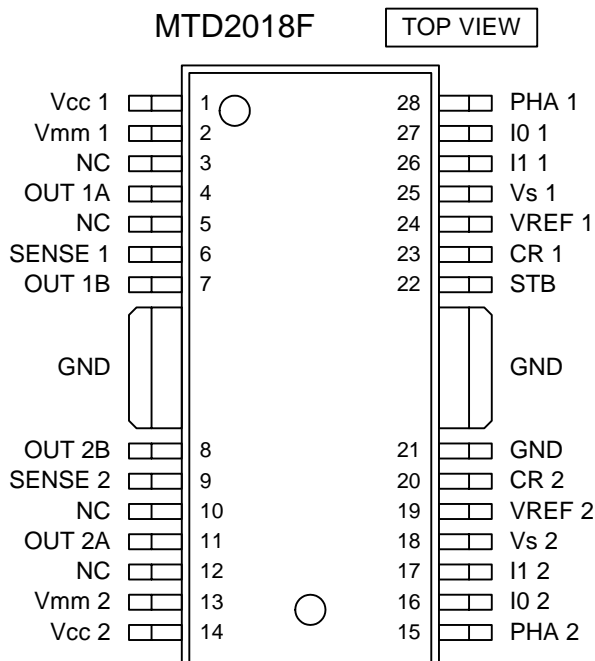


Absolute maximum ratings / Ta=25

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 ~ 3.6	V
Logic input	V <sub>LOGIC</sub>	0 ~ V <sub>CC</sub>	V
Power dissipation	P <sub>D</sub> *1	3	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),250mm<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=3.3V)
L	L	100	0.330 ± 5%
H	L	67	0.221 ± 8%
L	H	33	0.109 ± 10%
H	H	0	-

STB	Mode
L	stand by
H	active

**Electrical Characteristics**
 $T_a=25$  ,  $V_{cc}=3.3V$  unless otherwise specified

item	symbol	condition	MIN	TYP	MAX	unit
Logic supply current (2circuit ON)	I <sub>cc(ON)</sub>			50.0	62.0	mA
Logic supply current (2circuit OFF)	I <sub>cc(OFF)</sub>	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>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>	STB=L		3.5	4.7	mA
Load supply current(STB)	I <sub>mm(STB)</sub>	V <sub>mm</sub> =35V, STB=L			10.0	μA
PHA“H”input voltage	V <sub>PHA H</sub>		2.3	-	V <sub>cc</sub>	V
PHA“L”input voltage	V <sub>PHA L</sub>		GND	-	0.6	V
PHA“H”input current	I <sub>PHA H</sub>	V <sub>PHA</sub> =3.3V	-	-	10.0	μA
PHA“L”input current	I <sub>PHA L</sub>	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>mm</sub> =12V	2.3	-	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>mm</sub> =12V	GND	-	0.6	V
I <sub>0</sub> ,I <sub>1</sub> “H”input current	I(I <sub>0</sub> ,I <sub>1</sub> ) H	V(I <sub>0</sub> ,I <sub>1</sub> )=3.3V	-	-	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(I <sub>0</sub> ,I <sub>1</sub> )=0V	-	-2.0	-30.0	μA
STB“H”input voltage	V <sub>STB H</sub>		2.3		V <sub>cc</sub>	V
STB“L”input voltage	V <sub>STB L</sub>		GND		0.6	V
V <sub>ref</sub> input voltage	V <sub>REF</sub>		1.0	-	3.6	V
V <sub>ref</sub> input current	I <sub>REF</sub>	V <sub>REF</sub> =0V	-1.0	-	10.0	μA
V <sub>s</sub> input current	I <sub>s</sub>	V <sub>s</sub> =0V	-1.0	-	10.0	μA
comparator threshold(100%)	V <sub>s1</sub>	V <sub>REF</sub> =3.3V, I <sub>0</sub> =L, I <sub>1</sub> =L	0.314	0.330	0.347	V
comparator threshold(67%)	V <sub>s2</sub>	V <sub>REF</sub> =3.3V, I <sub>0</sub> =H, I <sub>1</sub> =L	0.203	0.221	0.239	V
comparator threshold(33%)	V <sub>s3</sub>	V <sub>REF</sub> =3.3V, I <sub>0</sub> =L, I <sub>1</sub> =H	0.098	0.109	0.120	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>		-	2.7	-	V
Thermal shutdown temperature	T <sub>JTSD</sub>		-	170	-	

**Recommended operation conditions**

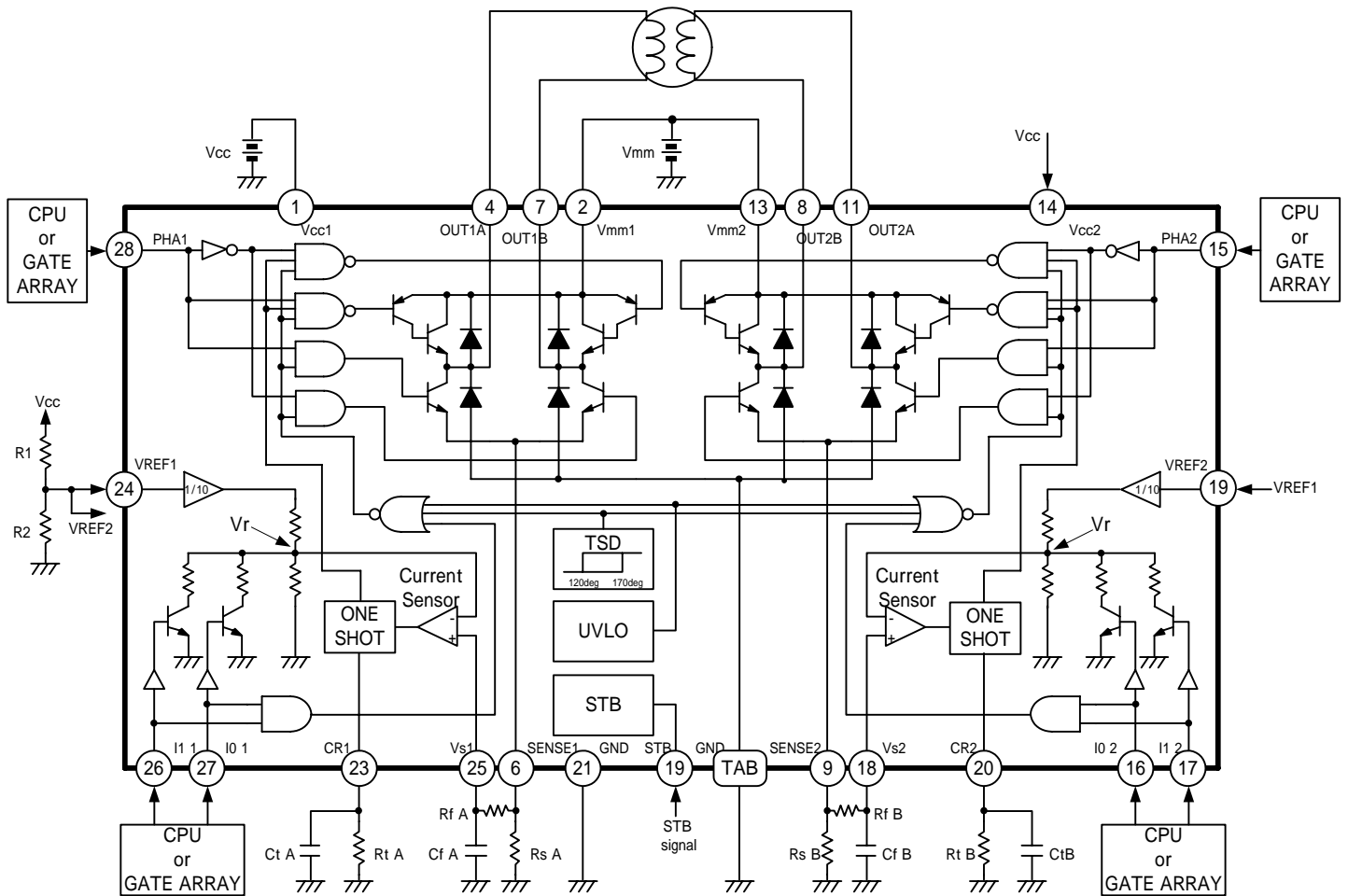
Parameter	Symbol	Recommendation	Unit
Junction temperature	T <sub>J</sub>	-25 ~ 120	
Logic supply	V <sub>cc</sub>	3.0 ~ 3.6	V
Load supply	V <sub>mm</sub>	7 ~ 27	V

**Thermal resistance**

Symbol	Rating	Unit
j <sub>a</sub> *1	41	/W

 \*1 : 50.8 × 50.8 × 1mm<sup>3</sup> Glass Epoxy Board(FR4), 250mm<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

$$T_{off} = 1.1C_tR_t$$

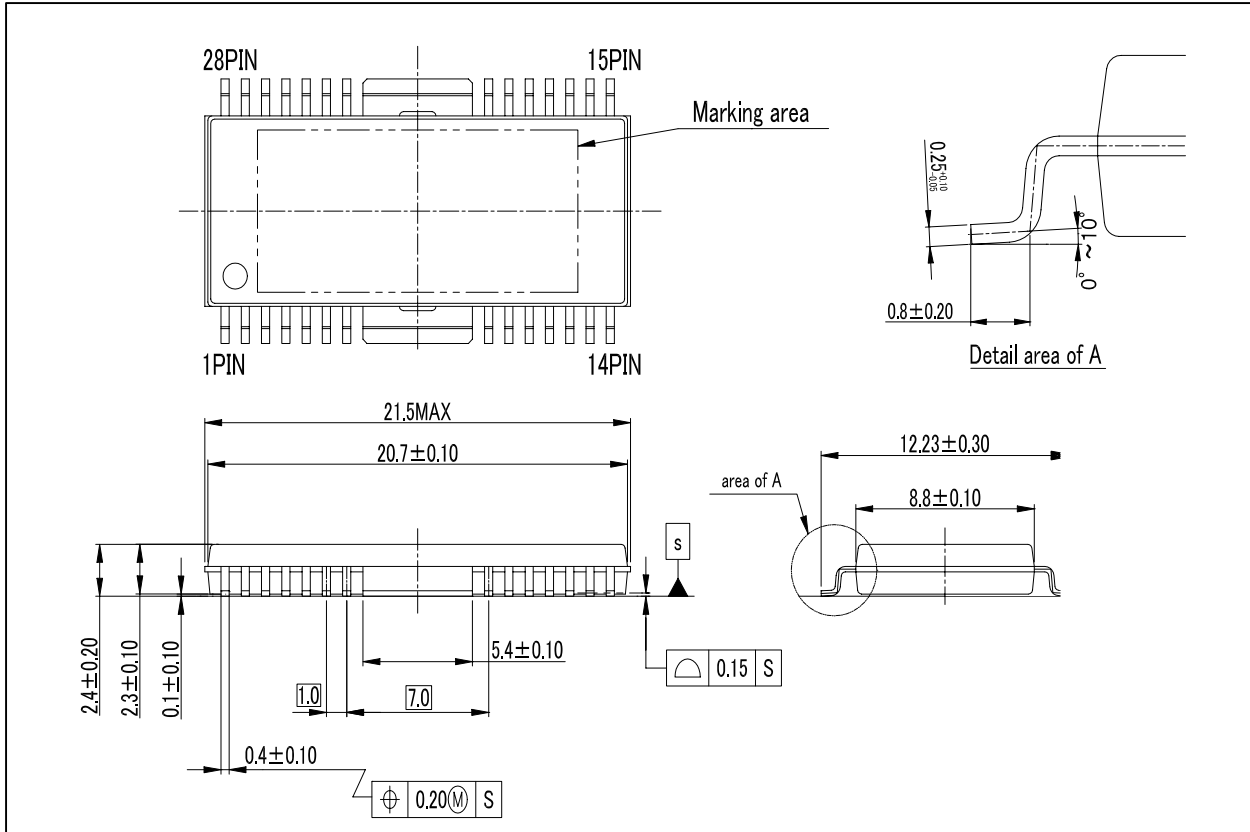
### Recommended component values

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

*Stepper Motor Driver IC*

MTD2018F

Outline Drawing



(Unit : mm)

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