

MTD2017F

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(HSOP28)

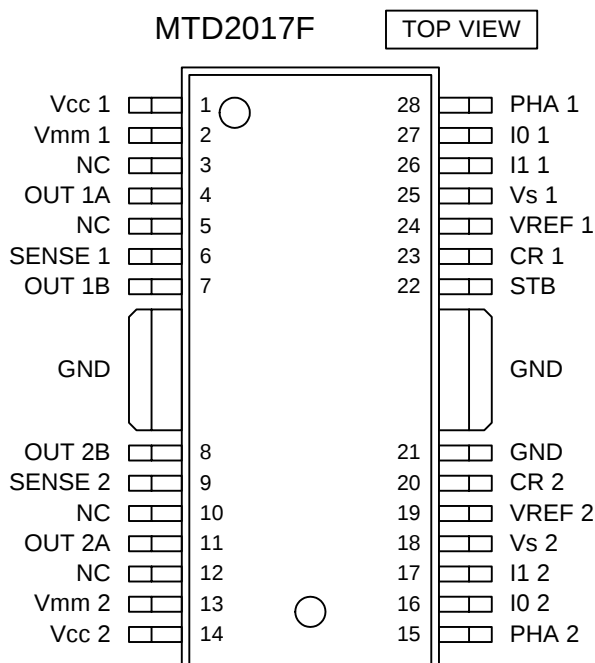


■ Absolute maximum ratings / Ta=25

Parameter	Symbol	Rating	Unit
Output voltage	V _{mm}	35	V
Output current	I _{OUT}	0.8	A
Logic supply	V _{cc}	0 ~ 6	V
Logic input	V _{LOGIC}	0 ~ V _{cc}	V
Power dissipation	P _T *1	3	W
Storage temperature range	T _{stg}	-40 ~ 150	
Maximum Junction temperature	T _j	150	

*1 : 50.8 × 50.8 × 1mm³ Glass Epoxy Board(FR4),250mm² 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

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■ Electrical Characteristics

Ta=25 unless otherwise specified

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

■ Recommended operation conditions

Parameter	Symbol	Recommendation	Unit
Junction temperature	T _J	-25 ~ 120	
Logic supply	V _{cc}	4.5 ~ 5.5	V
Load supply	V _{mm}	10 ~ 27	V

■ Thermal resistance

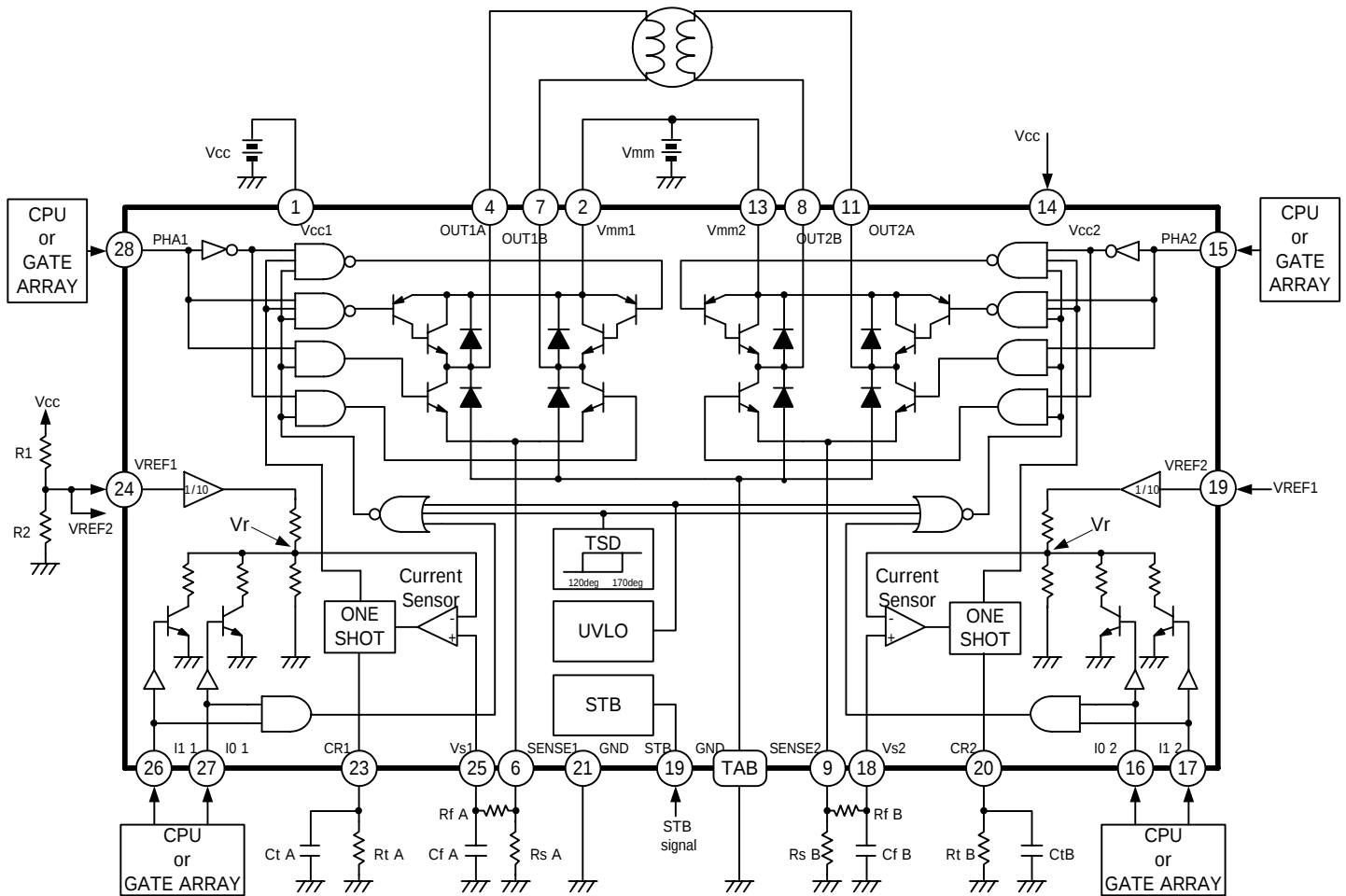
Symbol	Rating	Unit
θ _{ja} *	41	/W

 * 50.8 × 50.8 × 1mm³ Glass Epoxy Board(FR4), 250mm² Copper Pattern

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■ Block diagram / Typical application



● Constant chopping current level

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

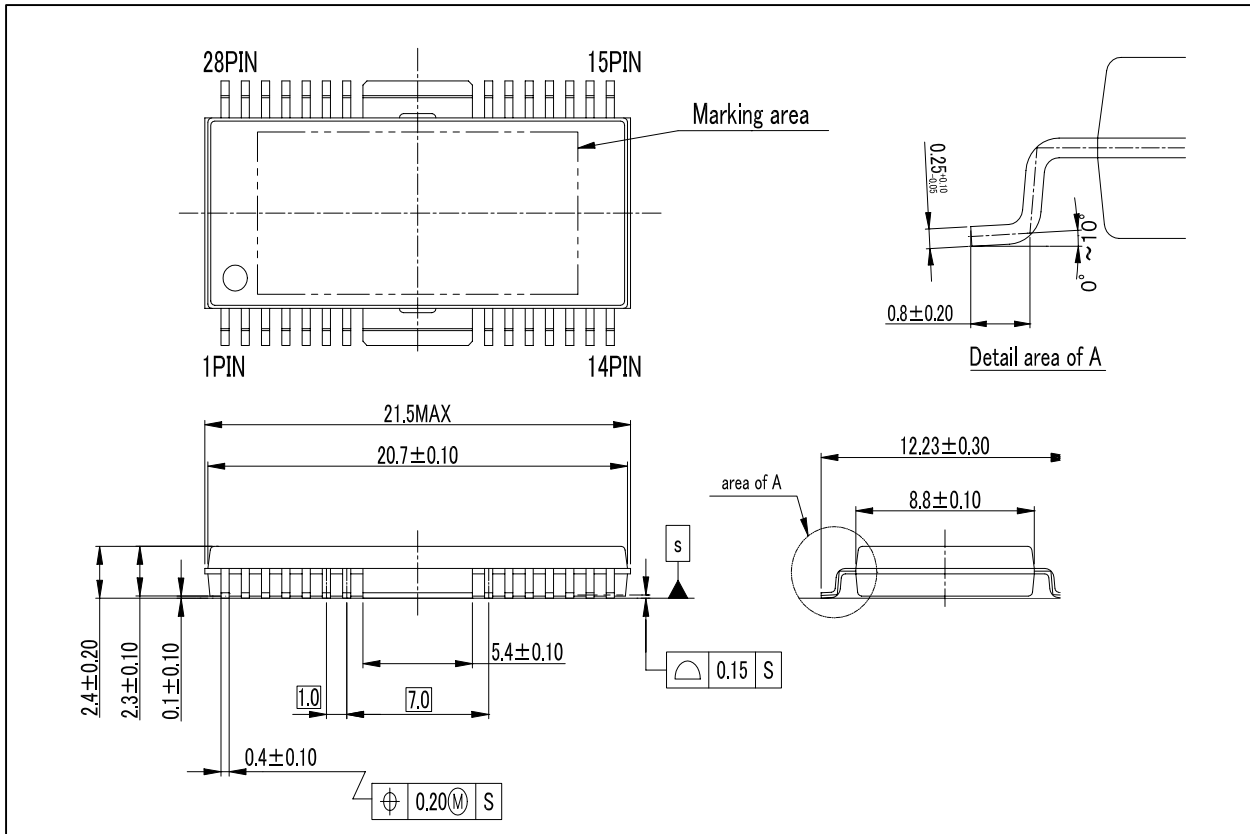
● ONE SHOT OFF TIME

$$T_{off} = 1.1C_tR_t$$

● Recommended component values

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

■ Outline Drawing



(Unit : mm)

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