

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)

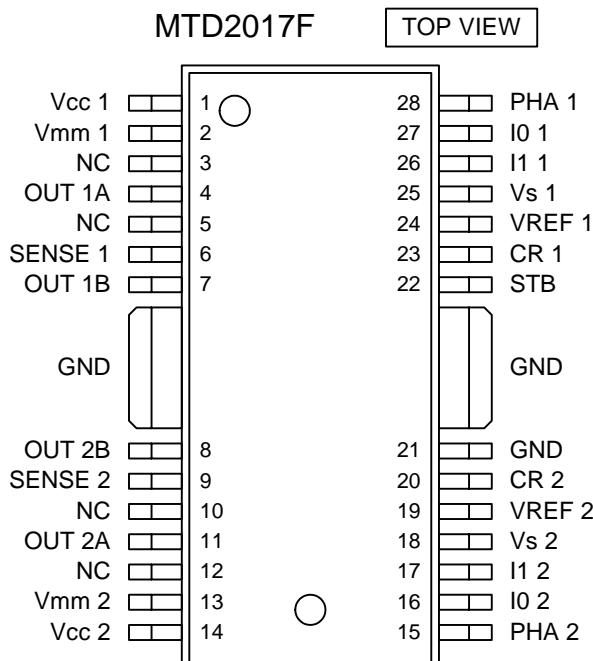


Absolute maximum ratings / Ta=25

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

Electrical Characteristics

Ta=25 unless otherwise specified

item	symbol	condition	MIN	TYP	MAX	unit
Logic supply current (2circuit ON)	Icc(ON)	Vcc=5V	-	50.0	62.0	mA
Logic supply current (2circuit OFF)	Icc(OFF)	Vcc=5V,I0=I1=H	-	17.0	21.0	mA
Load supply current (2circuit OFF)	Imm(OFF)	Vcc=5V,Vmm=35V,I0=I1=H	-	5.0	7.4	mA
Logic supply current(STB)	Icc(STB)	Vcc=5V,STB=L	-	3.5	4.7	mA
Load supply current(STB)	Imm(STB)	Vcc=5V,Vmm=35V,STB=L	-	-	10.0	μA
PHA“H”input voltage	VPHA H	Vcc=5V	2.0	-	Vcc	V
PHA“L”input voltage	VPHA L	Vcc=5V	GND	-	0.8	V
PHA“H”input current	IPHA H	Vcc=5V,VPHA =5V	-	-	10.0	μA
PHA“L”input current	IPHA L	Vcc=5V,VPHA =0V	-	-1.0	-10.0	μA
I0,I1“H”input voltage	V(I0,I1) H	Vcc=5V,Vmm=12V	2.0	-	Vcc	V
I0,I1“L”input voltage	V(I0,I1) L	Vcc=5V,Vmm=12V	GND	-	0.8	V
I0,I1“H”input current	I(I0,I1) H	Vcc=5V,V(I0,I1)=5V	-	-	10.0	μA
I0,I1“L”input current	I(I0,I1) L	Vcc=5V,V(I0,I1)=0V	-	-2.0	-30.0	μA
STB“H”input voltage	VSTB H	Vcc=5V	2.0	-	Vcc	V
STB“L”input voltage	VSTB L	Vcc=5V	GND	-	0.8	V
Vref input voltage	VREF	-	1.0	-	7.5	V
Vref input current	IREF	Vcc=5V,VREF=0V	-1	-	10.0	μA
Vs input current	Is	Vcc=5V,Vs=0V	-1	-	10.0	μA
comparator threshold(100%)	Vs1	Vcc=VREF=5V,I0=L,I1=L	0.475	0.500	0.525	V
comparator threshold(67%)	Vs2	Vcc=VREF=5V,I0=H,I1=L	0.308	0.335	0.362	V
comparator threshold(33%)	Vs3	Vcc=VREF=5V,I0=L,I1=H	0.140	0.165	0.182	V
Upper transistor saturation drop	Vce(SAT)H	Ic=0.8A	-	1.20	1.40	V
Lower transistor saturation drop	Vce(SAT)L	Ic=0.8A	-	0.70	1.00	V
Output leak current	Ir	Vmm=Vce(sus)V,Vout=0V	-	-	10.0	μA
Upper diode forward drop	VF H	If=0.8A	-	1.30	1.50	V
Lower diode forward drop	VF L	If=0.8A	-	1.40	1.60	V
One Shot OFF time	T OFF	Ct=3300pF,Rt=4.7K	-	17.1	-	μS
UVLO threshold	Vuv	-	-	4.0	-	V
Thermal shutdown temperature	TJSD	-	-	170	-	

Recommended operation conditions

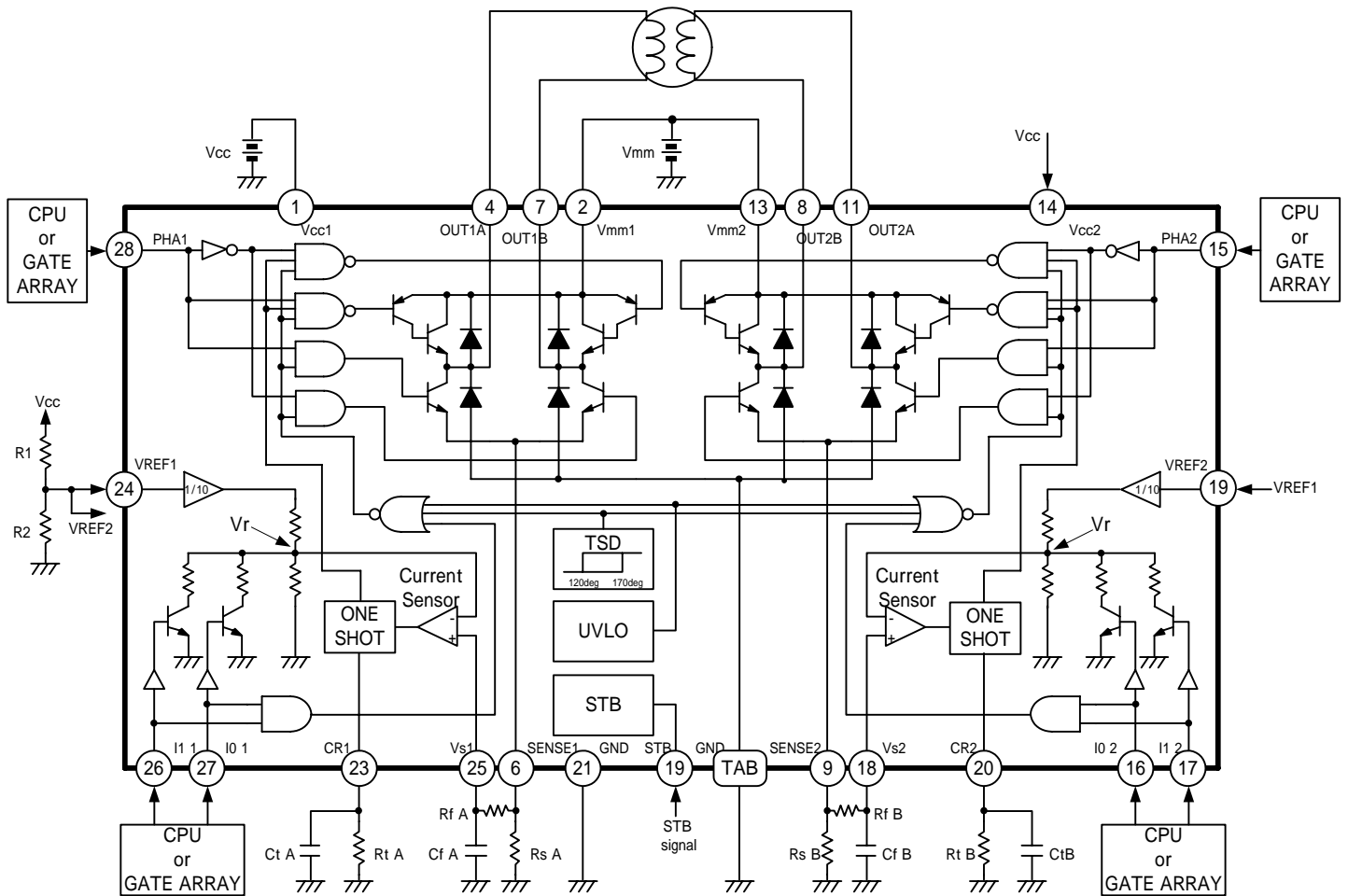
Parameter	Symbol	Recommendation	Unit
Junction temperature	Tj	-25 ~ 120	
Logic supply	Vcc	4.5 ~ 5.5	V
Load supply	Vmm	10 ~ 27	V

Thermal resistance

Symbol	Rating	Unit
ja *	41	/W

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

Block diagram / Typical application



Constant chopping current level

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

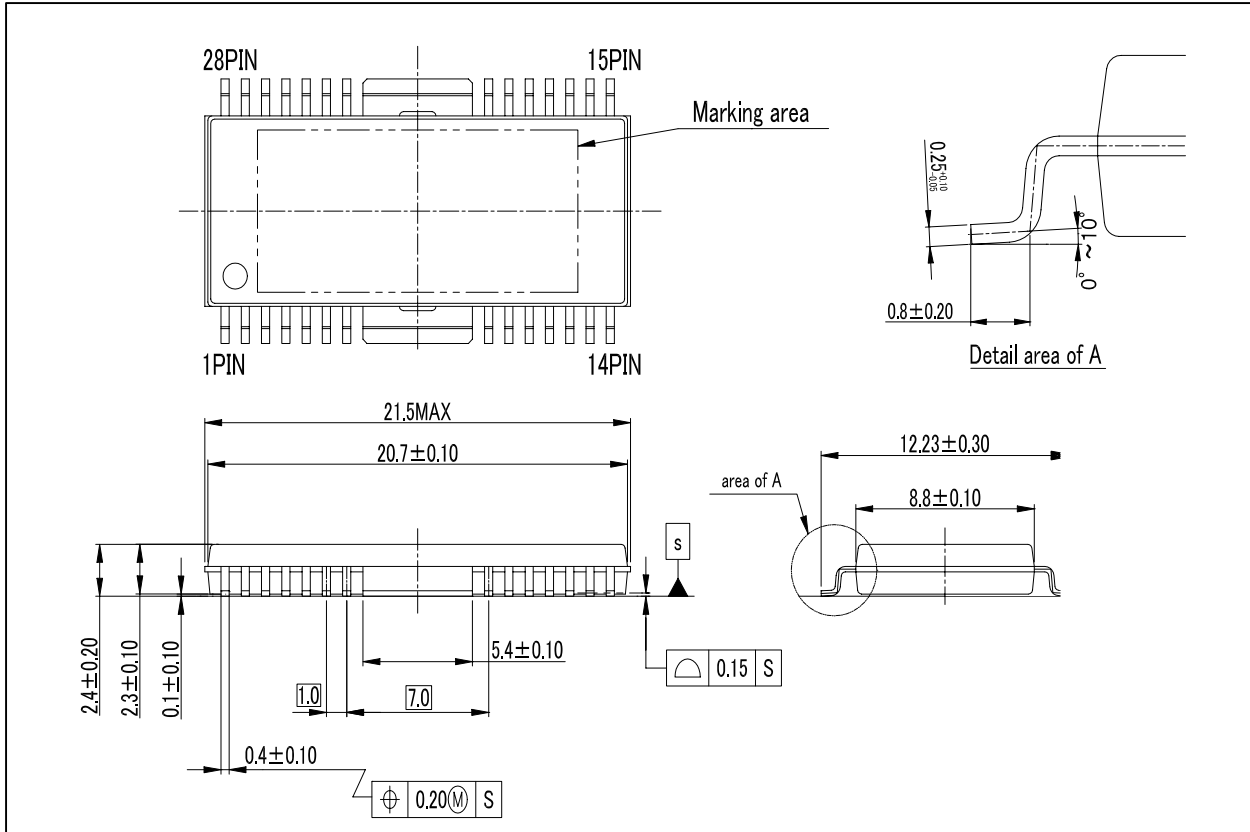
ONE SHOT OFF TIME

$$T_{off} = 1.1C_tR_t$$


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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