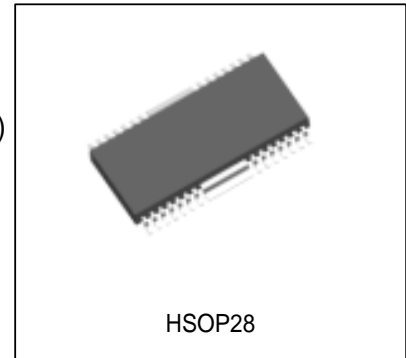


MTD2018F

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)

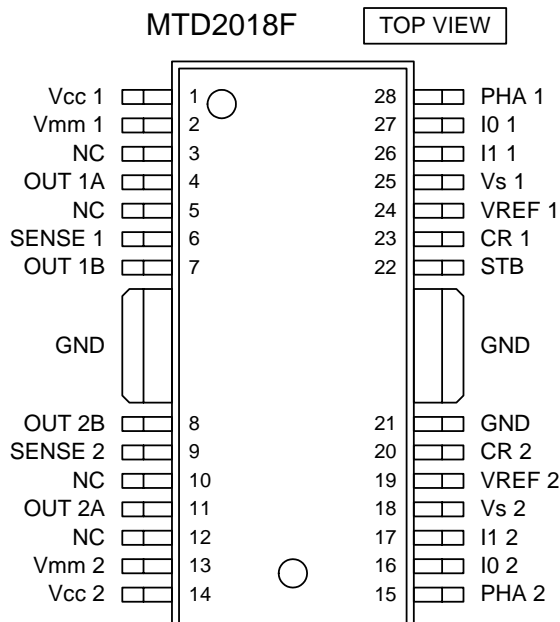


Absolute maximum ratings / Ta=25

Parameter	Symbol	Rating	Unit
Output voltage	V _{mm}	35	V
Output current	I _{OUT}	0.8	A
Logic supply	V _{CC}	0 ~ 3.6	V
Logic input	V _{LOGIC}	0 ~ V _{CC}	V
Power dissipation	P _D *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=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

Ta=25 , Vcc=3.3V unless otherwise specified

item	symbol	condition	MIN	TYP	MAX	unit
Logic supply current (2circuit ON)	Icc(ON)			50.0	62.0	mA
Logic supply current (2circuit OFF)	Icc(OFF)	I0=I1=H		17.0	21.0	mA
Load supply current (2circuit OFF)	I _{mm} (OFF)	V _{mm} =35V, I0=I1=H		5.0	7.4	mA
Logic supply current (STB)	Icc(STB)	STB=L		3.5	4.7	mA
Load supply current (STB)	I _{mm} (STB)	V _{mm} =35V, STB=L			10.0	μA
PHA "H" input voltage	V _{PHA H}		2.3	-	V _{cc}	V
PHA "L" input voltage	V _{PHA L}		GND	-	0.6	V
PHA "H" input current	I _{PHA H}	V _{PHA} =3.3V	-	-	10.0	μA
PHA "L" input current	I _{PHA L}	V _{PHA} =0V	-	-1.0	-10.0	μA
I0, I1 "H" input voltage	V(I0, I1) H	V _{mm} =12V	2.3	-	V _{cc}	V
I0, I1 "L" input voltage	V(I0, I1) L	V _{mm} =12V	GND	-	0.6	V
I0, I1 "H" input current	I(I0, I1) H	V(I0, I1)=3.3V	-	-	10.0	μA
I0, I1 "L" input current	I(I0, I1) L	V(I0, I1)=0V	-	-2.0	-30.0	μA
STB "H" input voltage	V _{STB H}		2.3		V _{cc}	V
STB "L" input voltage	V _{STB L}		GND		0.6	V
V _{ref} input voltage	V _{REF}		1.0	-	3.6	V
V _{ref} input current	I _{REF}	V _{REF} =0V	-1.0	-	10.0	μA
V _s input current	I _s	V _s =0V	-1.0	-	10.0	μA
comparator threshold (100%)	V _{s1}	V _{REF} =3.3V, I0=L, I1=L	0.314	0.330	0.347	V
comparator threshold (67%)	V _{s2}	V _{REF} =3.3V, I0=H, I1=L	0.203	0.221	0.239	V
comparator threshold (33%)	V _{s3}	V _{REF} =3.3V, I0=L, I1=H	0.098	0.109	0.120	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 =4.7K	-	17.1	-	μS
UVLO threshold	V _{uv}		-	2.7	-	V
Thermal shutdown temperature	T _{JSD}		-	170	-	

Recommended operation conditions

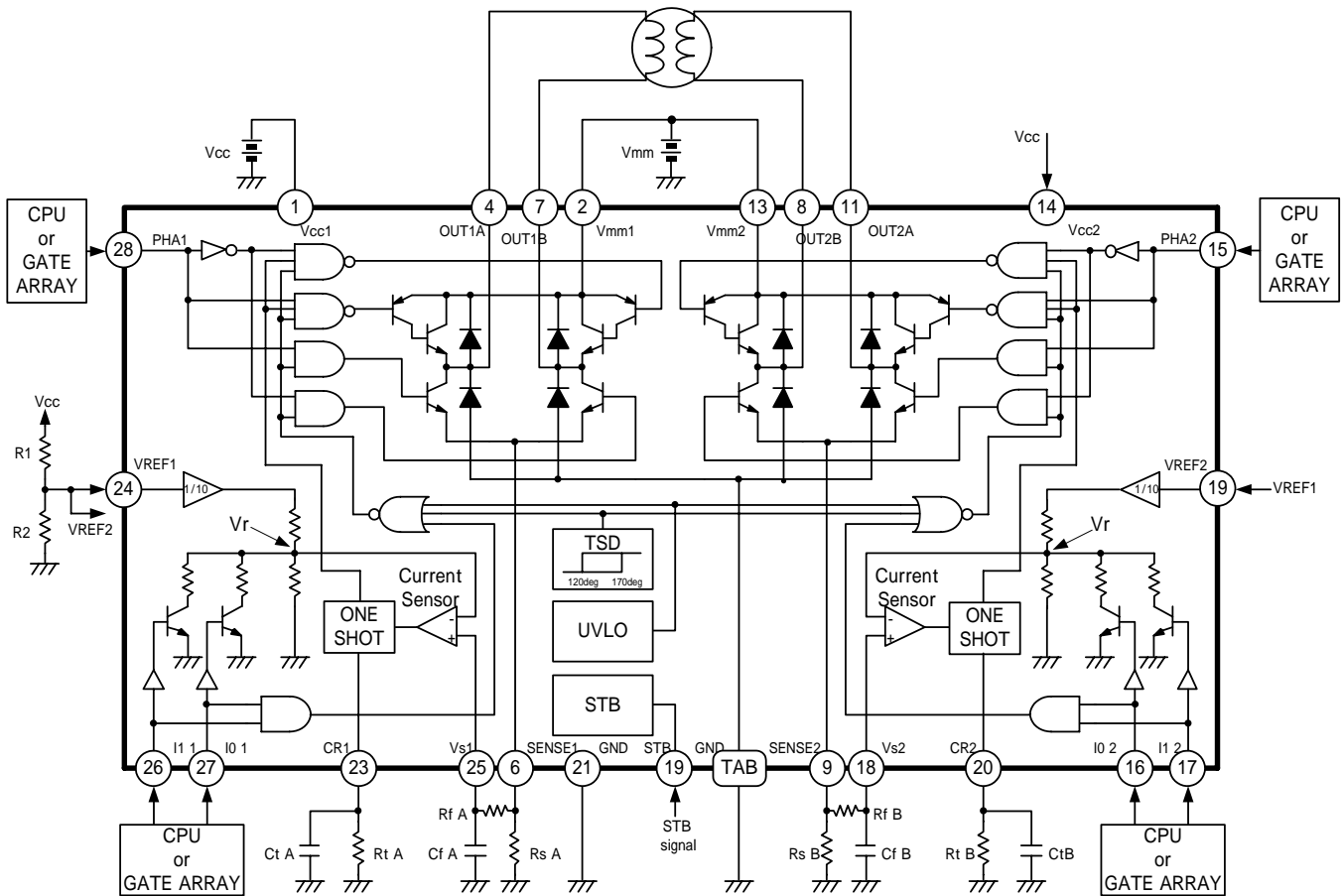
Parameter	Symbol	Recommendation	Unit
Junction temperature	T _j	-25 ~ 120	
Logic supply	V _{cc}	3.0 ~ 3.6	V
Load supply	V _{mm}	7 ~ 27	V

Thermal resistance

Symbol	Rating	Unit
j _a *1	41	/W

*1 : 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

$$T_{off} = 1.1CtRt$$

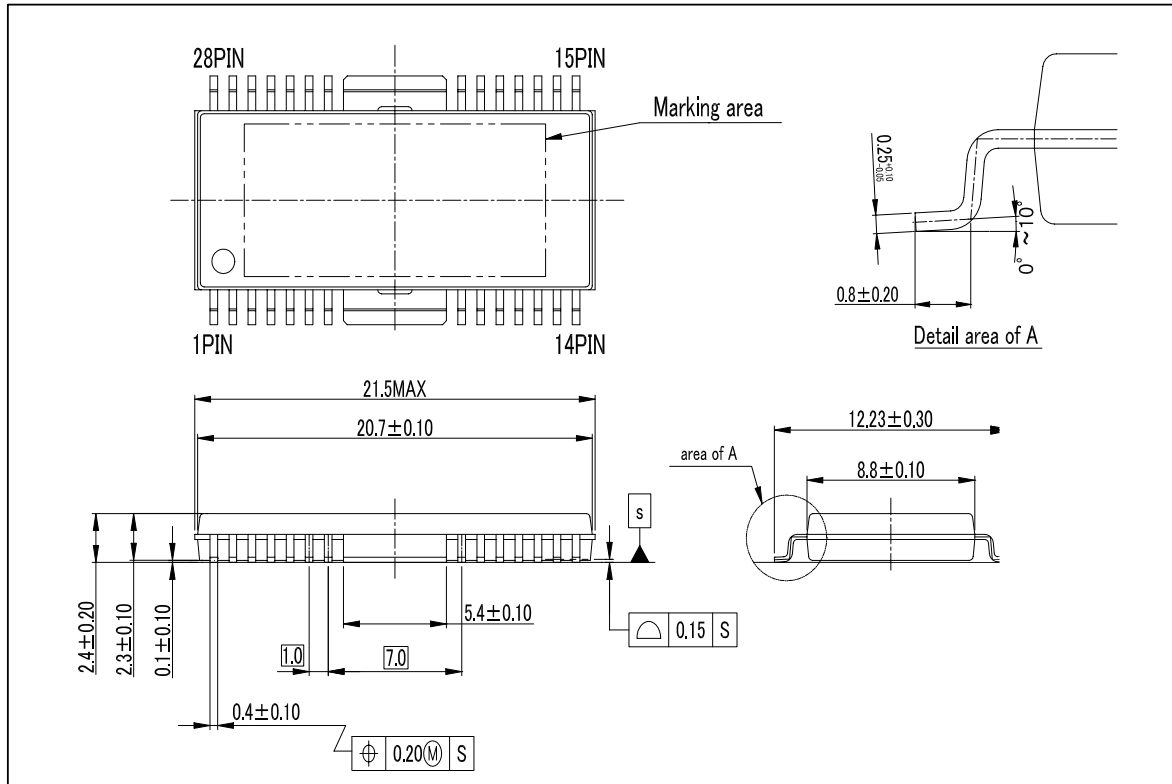
Recommended component values

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

Stepper Motor Driver IC

MTD2018F

Outline Drawing



(Unit : mm)

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