

MTD1121F

Unipolar PWM Stepper Motor Driver

Features

- Unipolar stepper motor driver
- Constant current control function(Fixed OFF Time)
- Logic supply voltage 3.3V
- TTL, CMOS compatible input
- 4-Phase input (Simultaneous ON prevention function)
- Built-in flywheel diodes
- Surface mount package with heat sink(HSOP28)

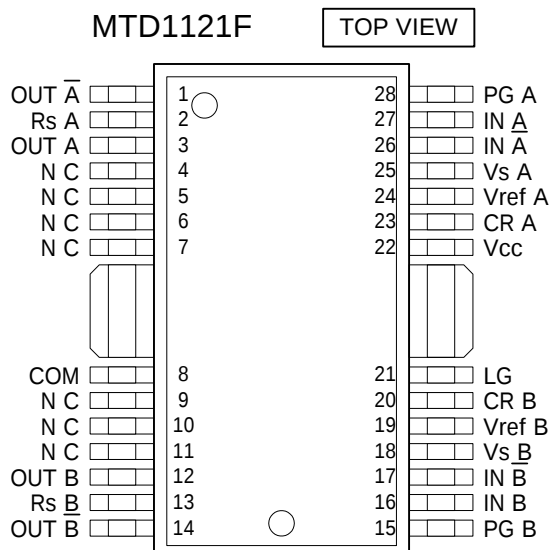


■ Absolute maximum ratings / Ta=25

Parameter	Symbol	Rating	Unit
Output voltage	$V_{CEO(SUS)}$	80	V
Output current	I_{OUT}	1.2	A
Logic supply	V_{CC}	0 ~ 3.6	V
Logic input	V_{LOGIC}	0 ~ V_{CC}	V
Power dissipation *	P_D	3	W
Storage temperature	T_{stg}	-40 ~ 150	
Maximum Junction temperature	T_j	150	

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

■ Pin Assignment



■ Truth table

IN A or B	IN $\bar{A}$ or $\bar{B}$	OUT A or B	OUT $\bar{A}$ or $\bar{B}$
L	L	OFF	OFF
L	H	OFF	ON
H	L	ON	OFF
H	H	OFF	OFF

■ Electrical Characteristics

Ta=25 °C, Vcc=3.3V unless otherwise specified

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Output transistor saturation voltage	$V_{CE(SAT)}$	$I_C=0.9A$	-	1.1	1.5	V
Output transistor leak current	I_{CER}	$V_{CER}=80V$	-	-	10	μA
Flywheel diode forward drop	V_{FFW}	$I_{FFW}=0.9A$	-	1.2	1.5	V
Flywheel diode leak current	I_{RFB}	$V_{RFB}=80V$	-	-	10	μA
Flyback diode forward drop	V_{FFB}	$I_{FFB}=0.9A$	-	1.3	2	V
Flyback diode leak current	I_{RFB}	$V_{RFB}=80V$	-	-	10	μA
Logic supply current	I_{CC}		-	30	100	mA
IN"H" input voltage	V_{INH}		2.0	-	Vcc	V
IN"L" input voltage	V_{INL}		GND	-	0.6	V
IN"H" input current	I_{INH}	$V_{IN}=3.3V$	-	-	10	μA
IN"L" input current	I_{INL}	$V_{IN}=0V$	-	-10	-50	μA
Vref input current	I_{ref}	$V_{ref}=0V$	-	-1	-50	μA
Vs input current	I_{sense}	$V_s=0V$	-	-	-50	μA
Chopping frequency	f_{CHOP}		-	20	-	kHz
Oneshot off time	t_{OFF}	$R_t=15k\Omega$, $C_t=2200pF$	12	20	27	μs
Vs maximum voltage	$V_s(max)$		-	-	0.7	V

■ Recommended operation conditions

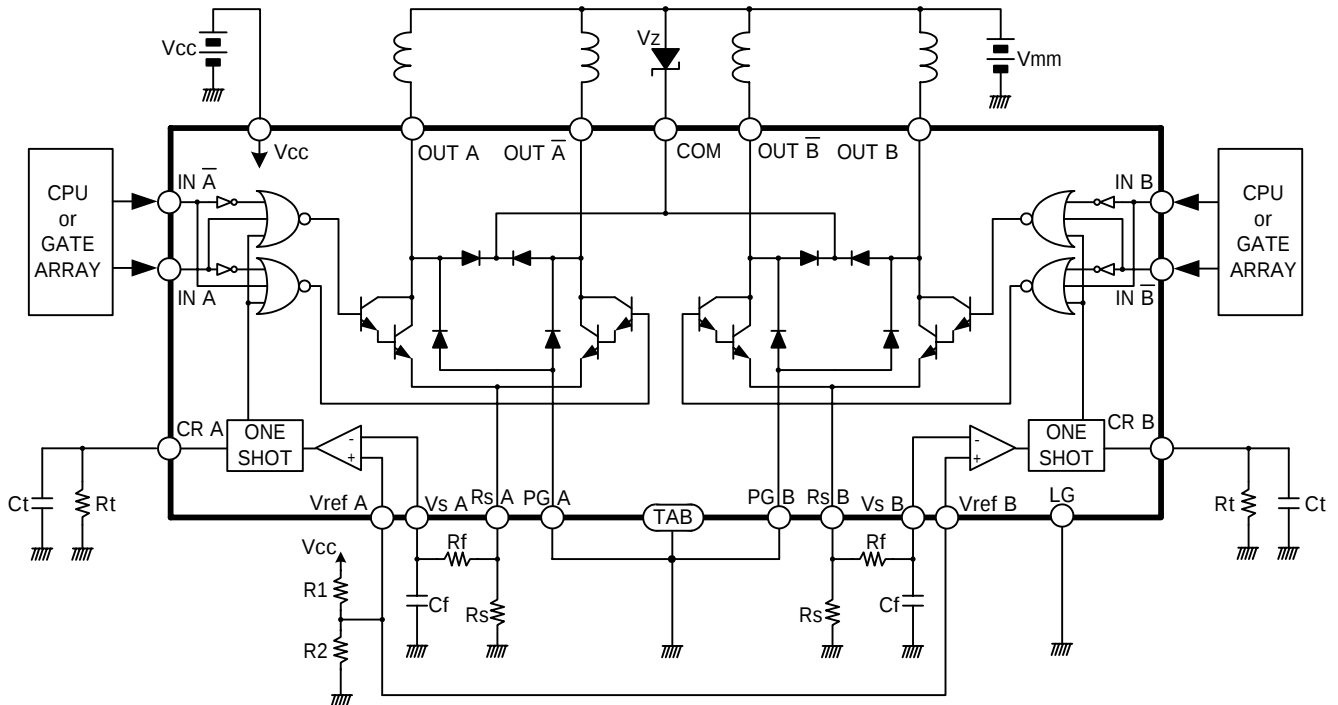
Parameter	Symbol	Recommendation	Unit
Junction temperature	T_j	-25 ~ 120	
Logic supply	Vcc	3.13 ~ 3.46	V
Load supply	Vmm	~ 27.5	V
Chopping frequency	f_{CHOP}	~ 27	kHz

■ Thermal resistance

Symbol	Rating	Unit
θ_{ja} *	41	/W

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

■ Block diagram / Typical application



● Constant chopping current level

$$I_{chop} = \frac{V_{ref}}{R_s}$$

● One shot off time

$$t_{off} = 0.69 \times C_t \times R_t$$

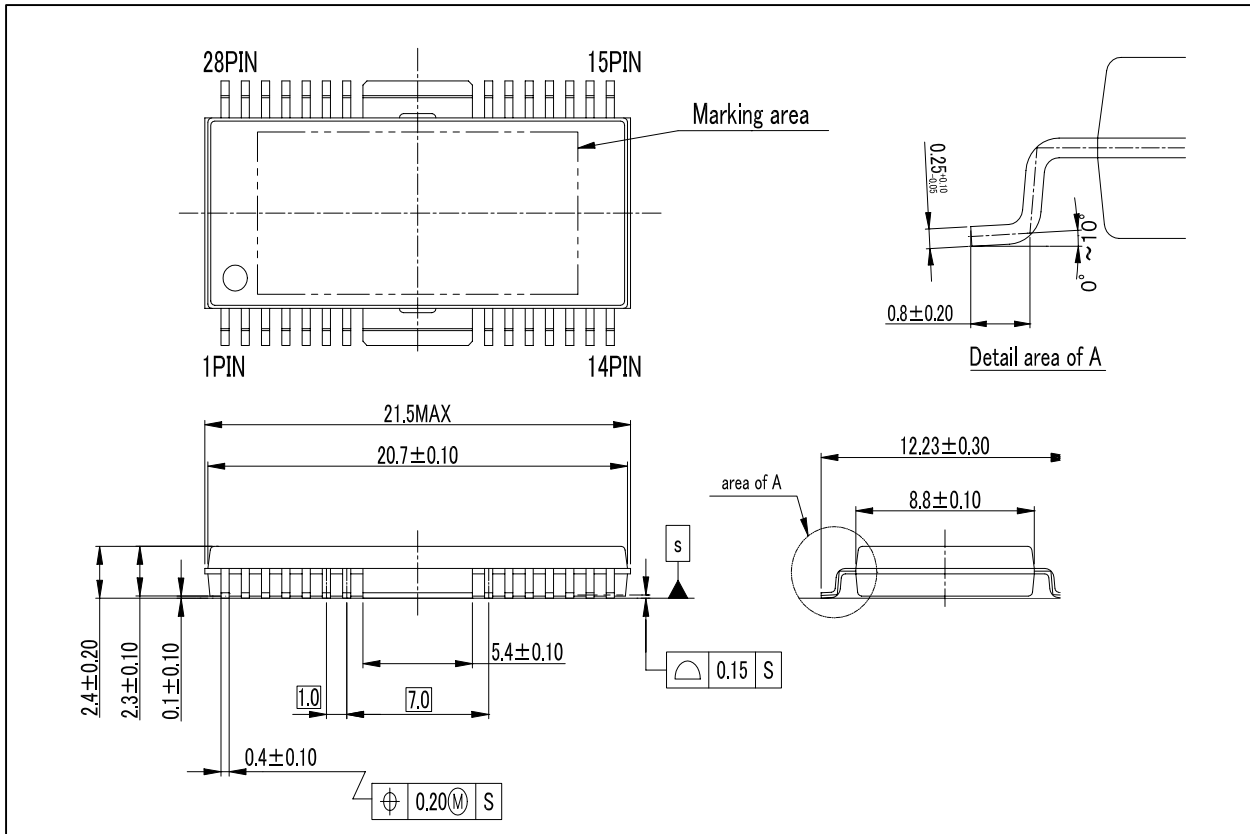
● Recommended component values

Symbol	Recommended value	Unit
R_s	0.68	Ω
C_f	3300	pF
R_f	1.0	k Ω
C_t	3300	pF
R_t	8.2	k Ω
V_z	$V_{mm} \times 1.2 \sim 1.5$	V
R_1+R_2	< 10	k Ω

Stepper Motor Driver IC

MTD1121F

■ Outline Drawing



(Unit : mm)

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