

# SHINDENGEN

## Stepping Motor Driver ICs

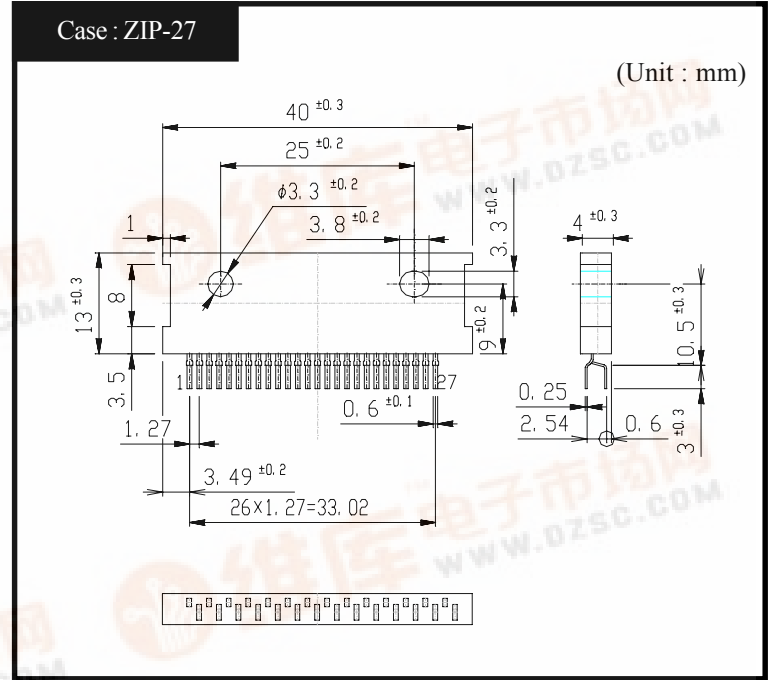
MTD Series

# MTD1120

## OUTLINE DIMENSIONS

Case : ZIP-27

(Unit : mm)



### FEATURES

- Constant-current chopping function (Off time fixed, self-oscillation)
- 4-phase input (with inhibit for simultaneously turn ON)
- Built-in flywheel diodes

### RATINGS

● Absolute Maximum Ratings Ta=25°C

Item	Symbol	Ratings	Unit
Output Voltage	$V_{CEO(SUS)}$	80	V
Output Current	$I_O$	1.2	A
Logic Supply Voltage	$V_{CC}$	0~7	V
Logic Input Voltage	$V_{IN}$	0~ $V_{CC}$	V
Total Power Dissipation	$P_T$	5	W
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-40~150	°C

● Electrical Characteristics Ta=25°C

Item	Symbol	Test Conditions	min.	typ.	max.	Unit
Output Saturation Voltage	$V_{CE(sat)}$	$I_O=0.9A$		1.1	1.4	V
Output Leakage Current	$I_{CER}$	$V_{CER}=80V$			10	$\mu A$
Logic Supply Current	$I_{CC}$	$V_{CC} = 5V$		30	70	mA
Input High Voltage	$V_{INH}$	$V_{CC} = 5V$	2.7		$V_{CC}$	V
Input Low Voltage	$V_{INL}$	$V_{CC} = 5V$	GND		1.0	V
Logic High Input Current	$I_{INH}$	$V_{CC} = 5V, V_{IN}=5V$			10	$\mu A$
Logic Low Input Current	$I_{INL}$	$V_{CC} = 5V, V_{IN}=0V$		-10	-50	$\mu A$
Reference Input Current	$I_{ref}$	$V_{CC} = 5V, V_{ref}=0V$		-1	-50	$\mu A$
Input Current(Current Sensor)	$I_{sense}$	$V_{CC}=5V, V_S=0V$		-1	-50	$\mu A$
Maximum Sensing Voltage	$V_S(max.)$	$V_{CC}=5V$			1.0	V

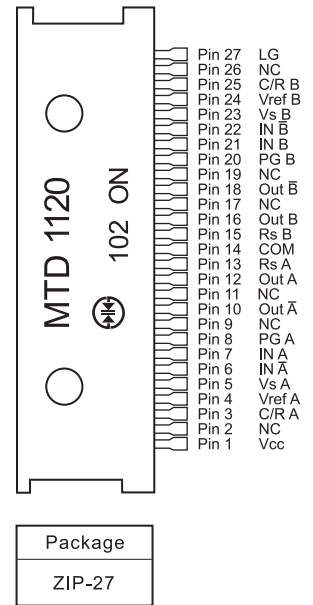
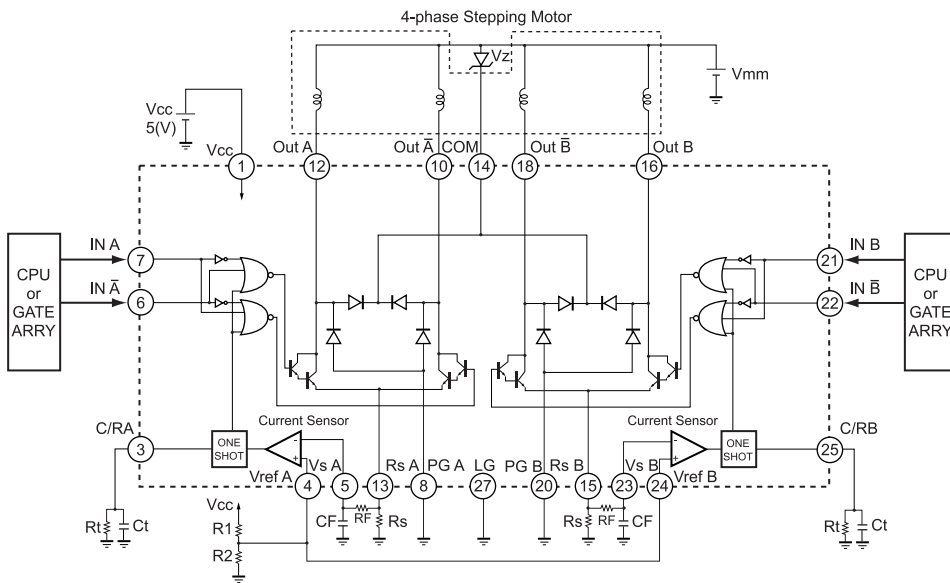


# Stepping Motor Driver ICs

# MTD1120

## ● Equivalent Circuit · Basic Application Circuit

## ● Pin Assignment



## ● True Table

IN A or B	IN A-bar or B-bar	Out A or B	Out A-bar or B-bar
L	L	OFF	OFF
L	H	OFF	ON
H	L	ON	OFF
H	H	OFF	OFF

## ● Recommended Parts Value

Symbol	Recommended Value	Unit
Rs	0.68	Ω
Rf	1	kΩ
CF	3300	pF
Rt	8.2	kΩ
Ct	3300	pF
Vz	V <sub>mm</sub> × 1.2 ~ 1.5	V
R1+R2	<10	kΩ

## ● Setting of Output Current and Fixed Off Time

Fig.1 shows constant current chopping wave form.

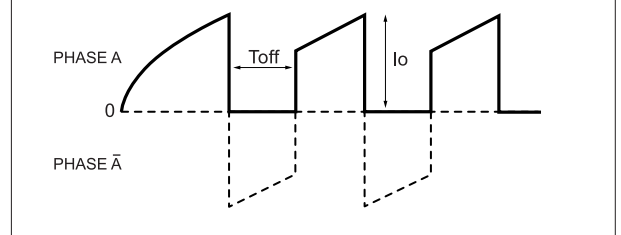
○ Output Current setting

$$I_o = \frac{R_2}{R_1 + R_2} \cdot \frac{V_{cc}}{R_s}$$

○ Fixed Off Time Setting

$$T_{off} = 0.69 \cdot C_t \cdot R_t$$

Fig.1 Constant current wave form (Motor current)



## ● Recommended Operating Conditions (Ta=25°C)

Item	Symbol	min.	typ.	max.	Unit
Motor Supply Voltage	V <sub>mm</sub>			32	V
Output Voltage	V <sub>OUT</sub>			70	V
Output Current	I <sub>o</sub>			0.9	A
Output Emitter Voltage	V <sub>E</sub>			1.0	V
Logic Supply Voltage	V <sub>CC</sub>	4.75		5.25	V
Chopping Frequency	f <sub>chop</sub>		20	27	kHz
Operating Temperature	T <sub>op</sub>	-25		120	°C