

# MTD2001

### FEATURES

- Constant-current chopping function (Off time fixed, self-oscillation)
- 4-phase input (with inhibit for simultaneously turn ON)
- An ENABLE function is provided
- Protection for penetration current
- Built-in overheating protection (Alarm + shutdown)

### RATINGS

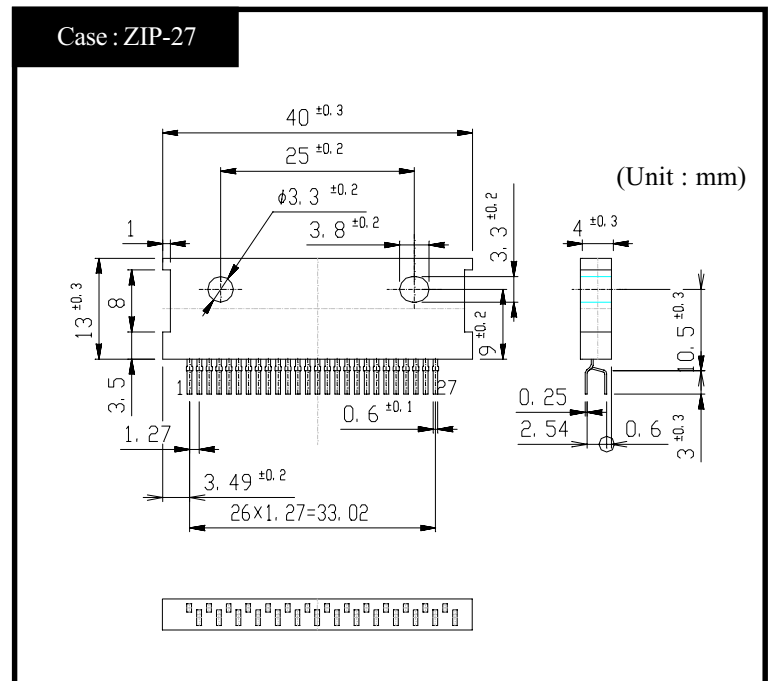
#### ● Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Unit
Output Voltage	$V_{CEO(SUS)}$	60	V
Output Current	$I_O$	1.5	A
Logic Supply Voltage	$V_{CC}$	0 to 7	V
Logic Input Voltage	$V_{IN}$	0 to $V_{CC}$	V
Total Power Dissipation	$P_T$	5	W
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-40 to 150	°C

#### ● Electrical Characteristics (Ta=25°C)

Item	Symbol	Test Conditions	min.	typ.	max.	Unit
Output Saturation Voltage(Upper side)	$V_{CE(sat)H}$	$I_o=1.0A$		1.0	1.4	V
Output Saturation Voltage(Lower side)	$V_{CE(sat)L}$	$I_o=1.0A$		1.0	1.3	V
Output Leakage Current(Upper side)	$I_{rH}$	$V_{mm}=60V, V_{out}=0V$			10	$\mu A$
Output Leakage Current(Lower side)	$I_{rL}$	$V_{out}=60V, V_{RS}=0V$			10	$\mu A$
Logic Supply Current(Standby)	$I_{CC(OFF)}$	$V_{CC}=5V, V_{ENA}="H"$		25	35	mA
Logic Supply Current(All Circuit ON)	$I_{CC(ON)}$	$V_{CC}=5V, V_{ENA}="L"$		55	75	mA
Input High Voltage	$V_{INH}$	$V_{CC} = 5V$	2.7		$V_{cc}$	V
	$V_{ENAH}$	$V_{CC} = 5V$	2.7		$V_{cc}$	
Input Low Voltage	$V_{INL}$	$V_{CC} = 5V$	GND		1.0	V
	$V_{ENAL}$	$V_{CC} = 5V$	GND		1.0	
Logic High Input Current	$I_{INH}$	$V_{CC} = 5V, V_{IN}=5V$			10	$\mu A$
	$I_{ENAH}$	$V_{CC} = 5V, V_{ENA}=5V$			10	
Logic Low Input Current	$I_{INL}$	$V_{CC} = 5V, V_{IN}=0V$		-10	-50	$\mu A$
	$I_{ENAL}$	$V_{CC} = 5V, V_{ENA}=0V$		-10	-50	
Reference Input Current	$I_{ref}$	$V_{CC}=5V, V_{ref}=0V$		-1	-10	$\mu A$
Input Current(Current Sensor)	$I_{sense}$	$V_{CC}=5V, V_s=0V$		-1	-10	$\mu A$
Maximum Sensing Voltage	$V_s(max.)$	$V_{CC}=5V$			1.5	V
Thermal Alarm Cutoff Current	$I_{ralm}$	$V_{CC}=5V, V_{alm}=5V$			10	$\mu A$
Thermal Alarm Output Current	$I_{alm}$	$V_{CC}=5V, V_{alm}=0.5V$			2	mA
Thermal Alarm Temperature	$T_{alm}$			125		°C
Thermal Shutdown Temperature	$T_{TSD}$			150		°C

### OUTLINE DIMENSIONS



## ● 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

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

## ● True Table

ENA A or B	IN 1 or 4	IN 2 or 3	Out 1 or 4	Out 2 or 3
L	L	L	OFF	OFF
L	L	H	L	H
L	H	L	H	L
L	H	H	OFF	OFF
H	×	×	OFF	OFF

× : don't care

## ● Recommended Parts Value

Symbol	Recommended Value	Unit
$R_s$	0.68	$\Omega$
RF	2	k $\Omega$
CF	1000	pF
$R_t$	15	k $\Omega$
$C_t$	3300	pF
$R_1+R_2$	<10	k $\Omega$

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

Item	Symbol	min.	typ.	max.	Unit
Motor Supply Voltage	$V_{mm}$	10		50	V
Output Current	$I_o$			1.2	A
Output Emitter Voltage	$V_E$			1.5	V
Logic Supply Voltage	$V_{cc}$	4.75		5.25	V
Chopping Frequency	fchop		20	27	kHz
Operating Temperature	$T_{op}$	-25		120	°C

## Equivalent Circuit / Basic Application Circuit

## Pin Assignment

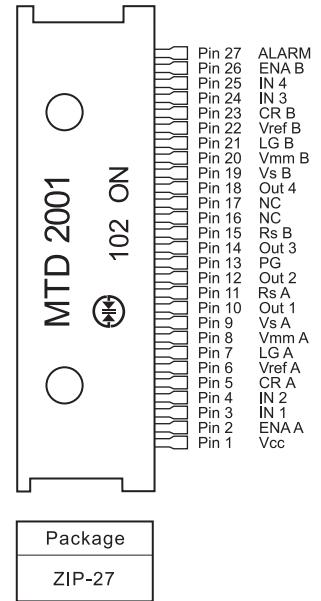
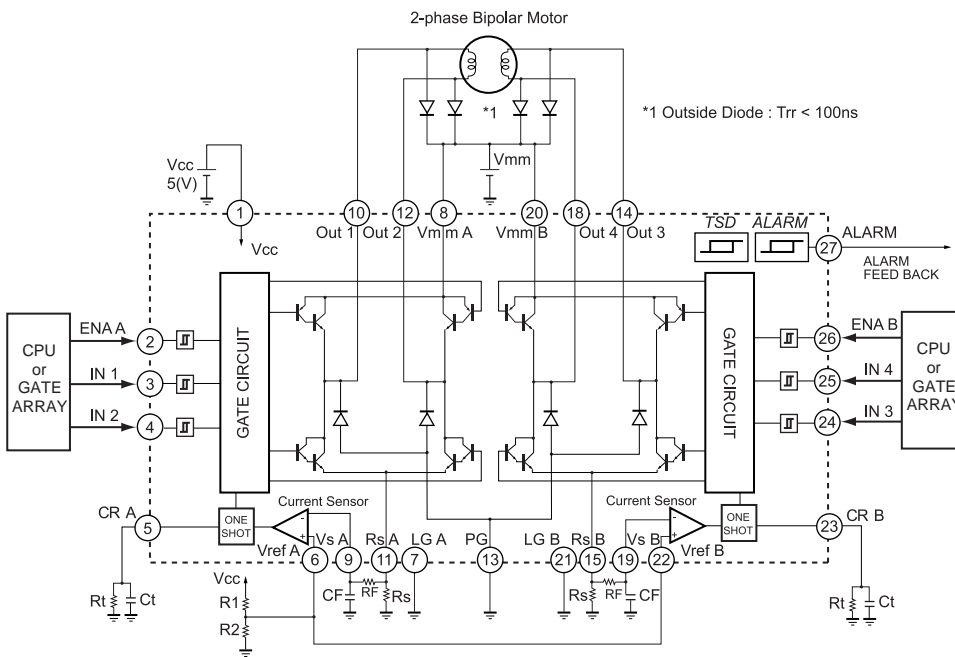


Fig.1 Constant current wave form (Motor current)

