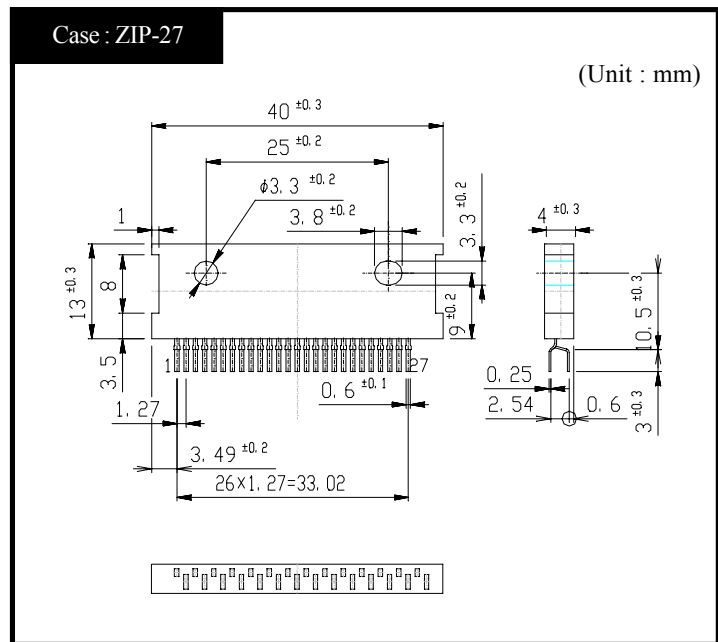


MTD2001

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)

OUTLINE DIMENSIONS



RATINGS

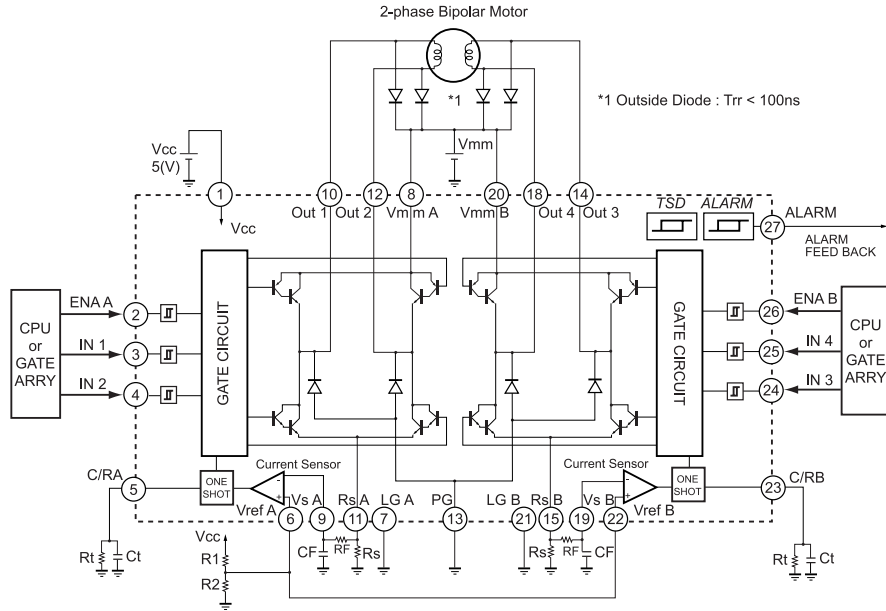
● Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Unit
Output Voltage	$V_{CEO(SUS)}$	60	V
Output Current	I_O	1.5	A
Logic Supply Voltage	V_{CC}	0~7	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

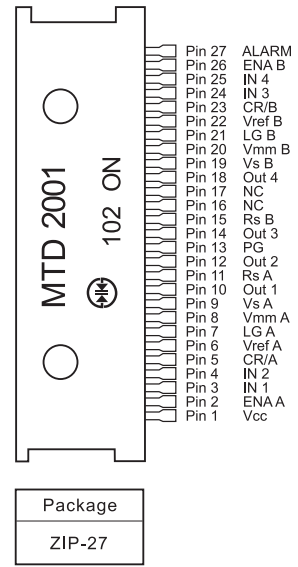
● Electrical Characteristics (Ta=25°C)

Item	Symbol	Test Conditions	min.	typ.	max.	Unit
Output Saturation Voltage(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	μA
Output Leakage Current(Lower side)	I_{rL}	$V_{out}=60V, V_{RS}=0V$			10	μA
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	μA
	I_{ENAH}	$V_{CC} = 5V, V_{ENA}=5V$			10	
Logic Low Input Current	I_{INL}	$V_{CC} = 5V, V_{IN}=0V$		-10	-50	μA
	I_{ENAL}	$V_{CC} = 5V, V_{ENA}=0V$		-10	-50	
Reference Input Current	I_{ref}	$V_{CC}=5V, V_{ref}=0V$		-1	-10	μA
Input Current(Current Sensor)	I_{sense}	$V_{CC}=5V, V_S=0V$		-1	-10	μA
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	μA
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

● Equivalent Circuit • Basic Application Circuit



● Pin Assignment



● 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	x	x	OFF	OFF

x : don't care

● Recommended Parts Value

Symbol	Recommended Value	Unit
Rs	0.68	Ω
RF	2	kΩ
CF	1000	pF
Rt	15	kΩ
Ct	3300	pF
R1+R2	<10	kΩ

● Setting of Output Current and Fixed Off Time

Fig.1 shows constant current chopping wave form.

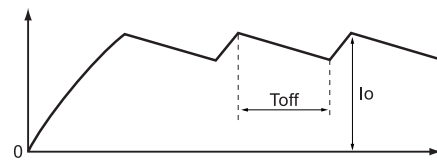
○ Output Current setting

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

○ Fixed Off Time Setting

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

Fig.1 Constant current wave form (Motor current / phase)



● Recommended Operating Conditions (Ta=25°C)

Item	Symbol	min.	typ.	max.	Unit
Motor Supply Voltage	Vmm	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	f _{chop}		20	27	kHz
Operating Temperature	T _{op}	-25		120	°C