

# Schrittmotor-Leistungsendstufen

## IMT-902 Treiber f. 2 Motoren 1/16 Schritt



fertige Treiber-Platine mit zusätzlichen Features: Siehe SMCI21

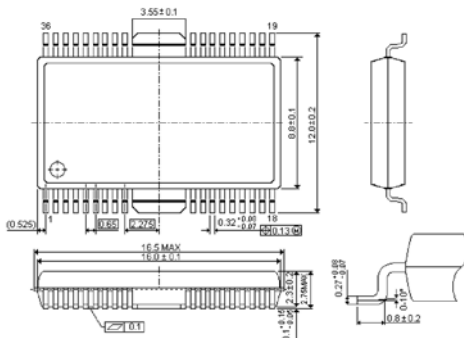
Der IMT 902 ist ein Mikroschritt-PWM-Konstantstrom-Treiber. Mit einem einzigen verlustarmen und hochintegrierten SMD-IC können zwei Bipolar-Schrittmotoren betrieben werden.

Weitere Daten finden Sie im Internet: [www.nanotec.de](http://www.nanotec.de)

### Vorteile

- nur 1 IC für 2 Motoren (bis 1,5 A/Phase) ermöglicht große Platz- und Kosteneinsparungen bei einem Maximum an Funktion und bei einem Minimum an externen Bauelementen
- Mikroschrittschaltung von 1/1, 1/2, 1/4, 1/8, 1/16 Schritt bietet einen ruhigen, gleichförmigen Lauf und reduziert Systemresonanzen
- niedriger  $R_{DS(on)} = 0,5 \text{ Ohm}$  reduziert erheblich die Verlustleistung
- serielles Übertragungsprotokoll (z.B. SPI) verringert die PIN-Anzahl

### Maßbild (mm)



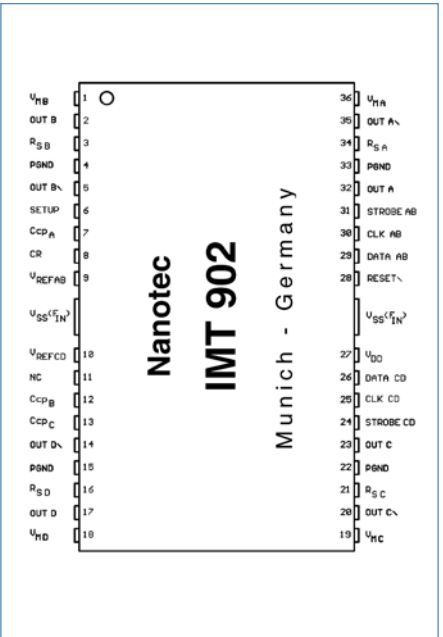
### Dateneingänge



### Serieller Dateneingang

DATA No.	NAME	FUNCTIONS
0	LSB	Hold Current 0
1		Hold Current 1
2	-	Must be set (H)
3	-	Must be cleared (L)
4	Current B <sub>0</sub>	Used for setting current.
5	Current B <sub>1</sub>	(LLLL = output all off mode)
6	Current B <sub>2</sub>	4-bit current B data
7	Current B <sub>3</sub>	(steps can be divided into 16 by 4-bit data)
8	Phase B	Phase information: High = OUT B High, OUT B Low
9	-	Must be set (H)
10	-	Must be cleared (L)
11	Current A <sub>0</sub>	Used for setting current.
12	Current A <sub>1</sub>	(LLLL = output all off mode)
13	Current A <sub>2</sub>	4-bit current A data
14	Current A <sub>3</sub>	(steps can be divided into 16 by 4-bit data)
15	MSB	Phase A
		Phase information: High = OUT A High, OUT A Low

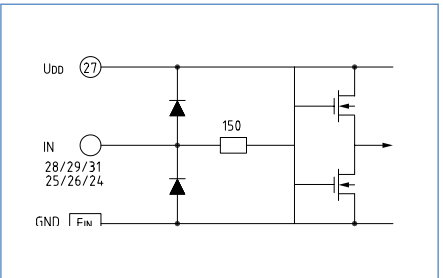
### PIN-Belegung



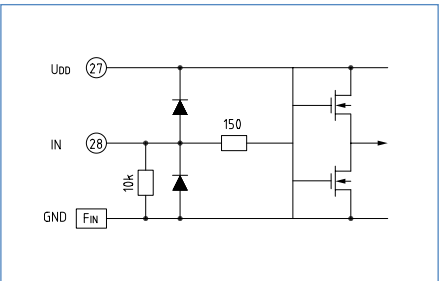
### max. Nennwerte (bei 25°C)

Vers. Spannung $V_{DD}$ :	5,5 V
$V_M$ :	40 V
Ausg. Strom $I_{out}$ :	1,3 A
(mittel)	1,1 A
(spitze)	1,5 A
Verl. Leistung $P_d$ :	3,2 W
Arbeitstemp.:	-40°C bis 85°C
Speichertemp.:	-50°C bis 150°C

### Eingänge CLK, DATA, STROBE



### Eingänge Reset



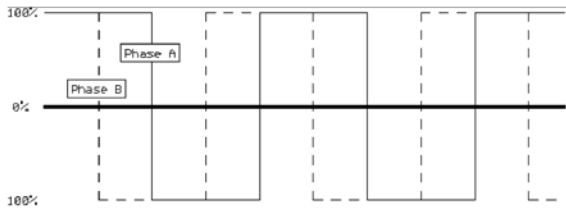
# IMT-902

## Application Daten Vollschritt

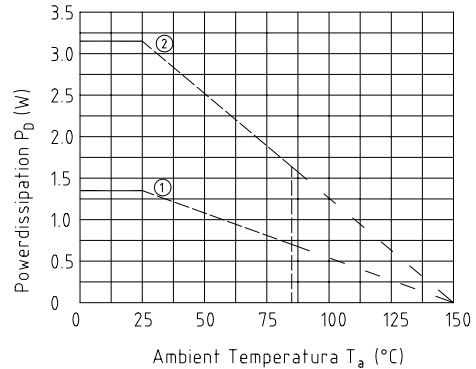
Bit	Hold Current 0	Hold Current 1	-	-	B <sub>0</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	Phase B	-	-	A <sub>0</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	Phase A	
0	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1
1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1
2	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1
3	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	0
4	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0

Data are input on the rising edge of CLK. Every input of a data string (16-bit) requires input of the STROBE signal. Hold Current is set to 100%.

Output current waveform of 2-phase excitation sine wave:

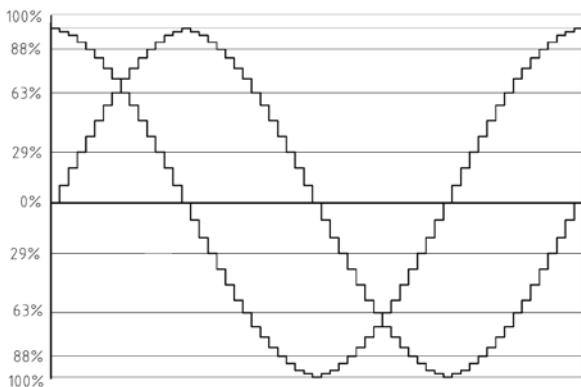


## Temperaturverhalten

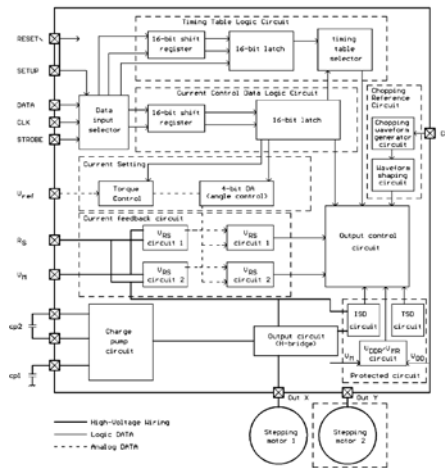


- ① R<sub>th(j-a)</sub> IC only (96°C/W)
  - ② When mounted on the board (38°C/W)
- Board size (100x200x1.6mm)

## Sechzehntel-Betrieb



## Blockdiagramm (interne Beschaltung)



## Elektrische Kennwerte (T<sub>a</sub>=25°, V<sub>DD</sub>=5V, V<sub>M</sub>=24V)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Voltage	High	V <sub>IN(H)</sub>	2.0	V <sub>DD</sub>	V <sub>DD</sub> +0.4	V
	Low	V <sub>IN(L)</sub>	GND - 0.4	GND	0.8	
Input Current 1	I <sub>IN1</sub> (I <sub>IN</sub> )	CLK, RESET, STROBE, DATA Pins	-	-	1.0	µA
	I <sub>IN2</sub> (I <sub>IN</sub> )	RESET, (SETUP H)	-	-	700	µA
Input Current 2	I <sub>IN3</sub> (I <sub>IN</sub> )	RESET, (SETUP H)	-	-	700	µA
	I <sub>IN4</sub> (I <sub>IN</sub> )	RESET, (SETUP H)	-	-	700	µA
Power Dissipation (V <sub>DD</sub> pin)	I <sub>DD1</sub>	V <sub>DD</sub> =5V (STROBE, RESET, DATA = L) logic, output all off	-	3.0	6.0	mA
	I <sub>DD2</sub>	Output open, f <sub>CLK</sub> =6.25MHz Logic active, V <sub>DD</sub> =5V Charge pump=charged	-	4.0	80	
Power Dissipation (V <sub>M</sub> pin)	IM 1	Output open (STROBE, RESET, DAT = L) Logic, output all off Charge pump = no operation	-	5.0	6.0	
	IM 2	Output open, f <sub>CLK</sub> = 6.25 MHz, logic active, V <sub>DD</sub> =5V, output off Charge pump=charged	-	12	20	mA
	IM 3	Output open, f <sub>CLK</sub> = 6.25 MHz, logic active, 100kHz chopping, output open, charge pump=charged, C <sub>cp1</sub> =0.22µF, C <sub>cp2</sub> =0.01µF	-	30	40	
Output Standby Current	I <sub>OH</sub>	V <sub>DD</sub> =V <sub>M</sub> =24V, V <sub>DD</sub> =0V, RESET=H, DATA all L	-400	-	-	µA
Output Bias Current	I <sub>OB</sub>	V <sub>DD</sub> =V <sub>M</sub> =24V, V <sub>DD</sub> =24V, RESET=H, DATA all L	-200	-	-	µA
Output Leakage Current	I <sub>OL</sub>	V <sub>DD</sub> =V <sub>M</sub> =C <sub>CP</sub> A=V <sub>DD</sub> =24V, RESET=H, DATA all L	-	-	1.0	
Comparator Reference Voltage Ratio	High	V <sub>IN</sub> (H)	-	100	-	%
	Mid	V <sub>IN</sub> (M)	83	85	87	
	Low	V <sub>IN</sub> (L)	68	70	72	
	Low	V <sub>IN</sub> (L)	48	50	52	

## Blockdiagramm (+ externe Beschaltung)

