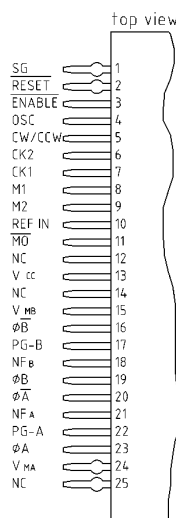


Advantages:

- only one IC for power and logic (up to 2,5 A/phase)
reduces considerably space, assembly time and cost of a microstep driver with a max. functions yet with a min. of ext. components.
- selectable from: 1/1-, 1/2-, 1/4-, 1/8-Step
enables individual application-related microstep switching, smooth and constant running and reduces considerably system resonance.
- Current down system or current zeroing
reduces or eliminates motor power losses and heating during stand-still

max. Nominal Values (at 25 °C)



Input		Mode
M1	M2	
L	L	1/1 Step
H	L	1/2 Step
L	H	1/4 Step
H	H	1/8 Step

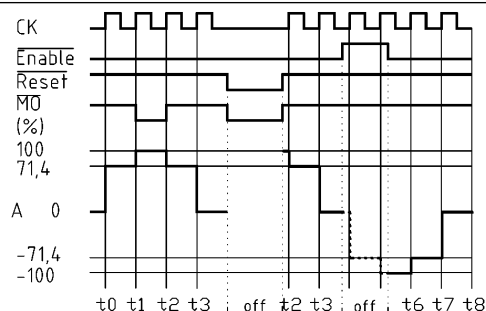
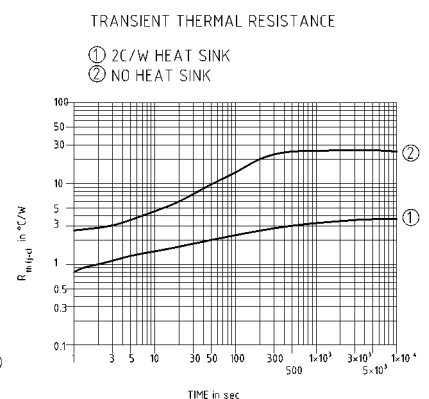
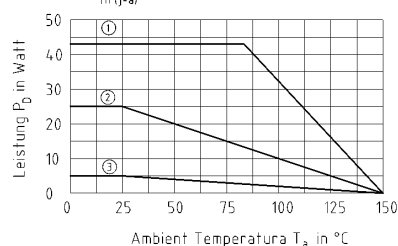
Signal Circuit times

t1: pulse width	>10 μ s
t2: pulse width	>10 μ s
t3:	> 5 μ s
t4:	>10 μ s



Thermal Behavior

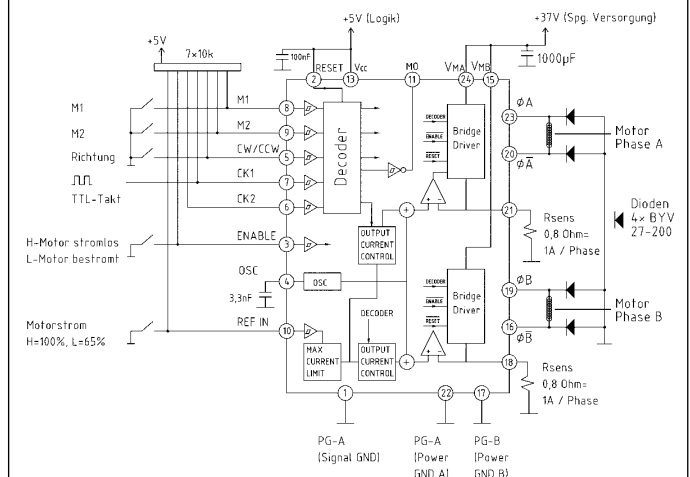
- ① INFINITE HEAT SINK
 $R_{th(j-a)} = 1,5^{\circ}\text{C/W}$
- ② HEAT SINK
{with $3,5^{\circ}\text{C/W}$ Heat Pin and $1,5^{\circ}\text{C}$
contact thermal Resistance; Total 5°C/W }
- ③ NO HEAT SINK
 $R_{th(j-a)} = 25^{\circ}\text{C/W}$



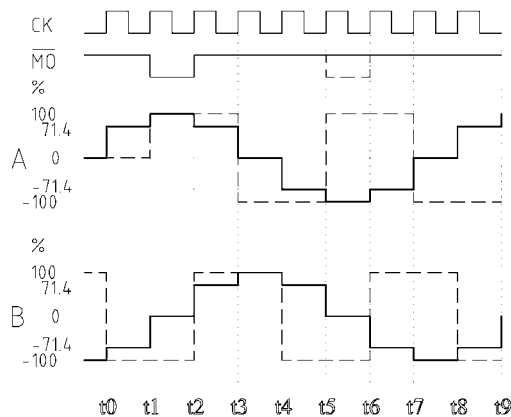
Function Table

INPUT					MODE
CK1	CK2	CW/CCW	Enable	Reset	
	H	L	L	H	CW
	L	L	L	H	INHIBIT
H		L	L	H	CCW
L		L	L	L	INHIBIT
	H	H	L	H	CCW
	L	H	L	H	INHIBIT
H		H	L	H	CW
L		H	L	H	INHIBIT
X	X	X	H	H	Z
X	X	X	X	L	Z

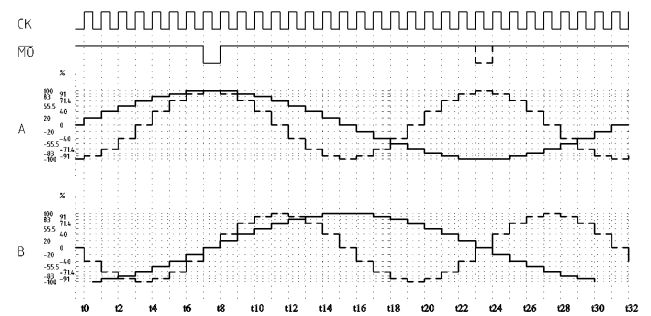
Block diagram (+ external Circuit)



Full-/Half-Step Mode



Quarter-/Eighth-Step Mode



Electrical Characteristics 1 (Ta=25°, VCC=5V, VM=24V)

CHARACTERISTICS				SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.		
NF Terminal Current				I_{NF}	-	SOURCE TYPE	-	170	-		
OSC Frequency				f_{OSC}	-	$C_{OSC}=0.0033\mu F$	25	44	62		
Output Saturation Voltage		Upper Side		V_{SAT+}	-	$I_{OUT}=0.8 A$	-	1.8	2.2		
		Lower Side		V_{SAT-}			-	1.1	1.5		
A-B CHOPPING CURRENT (Note 1)		2W1-2e	W1-2e	1-2e	VECTOR	-	REF IN : L $R_{FB}=0.8 \Omega$ $C_{OS2}=0.0033\mu F$	0=0/8	-	100	
		2W1-2e	-	-				0=1/8	-	100	
		2W1-2e	W1-2e	-				0=2/8	86	91	96
		2W1-2e	-	-				0=3/8	78	83	88
		2W1-2e	W1-2e	1-2e				0=4/8	66.4	71.4	76.4
		2W1-2e	-	-				0=5/8	50.5	55.5	60.5
		2W1-2e	W1-2e	-				0=6/8	35	40	45
		2W1-2e	-	-				0=7/8	15	20	25
2 Phase excitation mode VECTOR							-	141	-		
Feed Back Voltage Step				ΔV_{FB}	-	$\Delta\theta=0/8-1/8$	-	0	-		
						$\Delta\theta=1/8-2/8$	32	72	112		
						$\Delta\theta=2/8-3/8$	24	64	104		
						$\Delta\theta=3/8-4/8$	53	93	133		
						$\Delta\theta=4/8-5/8$	87	127	167		
						$\Delta\theta=5/8-6/8$	84	124	164		
Output T _s Switching Characteristics				t_r	-	$R_L=2\Omega, V_{IN}=0V$ $C_L=15pF$	-	0.3	-		
							t_f	-	2.2	-	
				t_{on}	-	-	CK-Output	-	1.5	-	
				t_{off}				-	2.7	-	
				t_{on}	-	-	OSC-Output	-	5.4	-	
				t_{off}				-	6.3	-	
				t_{on}	-	-	RESET-Output	-	2.0	-	
				t_{off}				-	2.5	-	
				t_{on}	-	-	ENABLE-Output	-	5.0	-	
				t_{off}				-	6.0	-	
Output Leakage Current		Upper Side		I_{OH}	-	$V_{IN}=30V$	-	-	50		
		Lower Side		I_{OL}			-	-	50		
Output Voltage		$V_{OH(MO)}$		-	-	$I_{OH}=-40\mu A$ $I_{OL}=40\mu A$	4.5	4.9	V_{CC}		
		$V_{OL(MO)}$		-			GND	4.1	0.5		

Note : Maximum Current (θ=0) : 100%

2W1-2e: 2W1, 2 phase excitation mode

W1-2e: W1, 2 phase excitation mode

1-2e: 1, 2 phase excitation mode

Electrical Characteristics 2 (Ta=25°, VCC=5V, VM=24V)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	High	$V_{IN H}$	M1, M2, CW/CCW, REF IN	3.5	-	$V_{CC}+0.4$	V
	Low	$V_{IN L}$	ENABLE, CK1, CK2	GND-0.4	-	1.5	V
Input Hysteresis Voltage	V_H	-	RESET	-	600	-	mV
Input Current	$I_{IN(H)}$	-	M1, M2, REF IN, ENABLE $V_{IN}=5.0 V$	-	-	100	nA
	$I_{IN(L)}$	-	RESET, $V_{IN}=0 V$	10	50	100	µA
	$I_{IN(2L)}$	-	INTERNAL PULL-UP-RESISTOR	-	-	100	nA
Quiescent Current	V_{CC}	I_{CC1}	Output Open RESET : H, ENABLE : L (2, 1 - 2 Phase excitation)	-	10	18	mA
	V_{CC}	I_{CC2}	Output Open (W1-2, 2W1-2 Phase Excitation)	-	10	18	
	V_{CC}	I_{CC3}	RESET : H, ENABLE : L	-	5	-	
	V_{CC}	I_{CC4}	RESET : L, ENABLE : L	-	5	-	
Comparator Reference Voltage	$V_{NF(H)}$	-	REF IN H Output Open	0.72	0.8	0.88	V
	$V_{NF(L)}$	-	REF IN H Output Open	0.45	0.5	0.55	
Output Differential	ΔV_O	-	B/A $C_{OSC}=0.0033 \mu F, R_{NF}=0.8 \Omega$	-10	-	10	%
Output Voltage	$V_{OH(MO)}$	-	$V_{NF(L)}/V_{NF(H)}$ $C_{OSC}=0.0033 \mu F, R_{NF}=0.8 \Omega$	56	63	70	%
	$V_{OH(MO)}$	-	$I_{OH}=-40\mu A$	4.5	4.9	V_{CC}	mV
	$V_{OH(MO)}$	-	$I_{OH}=-40\mu A$	GND	0.1	0.5	mV