

Érzékelők és beavatkozók

Léptetőmotorok

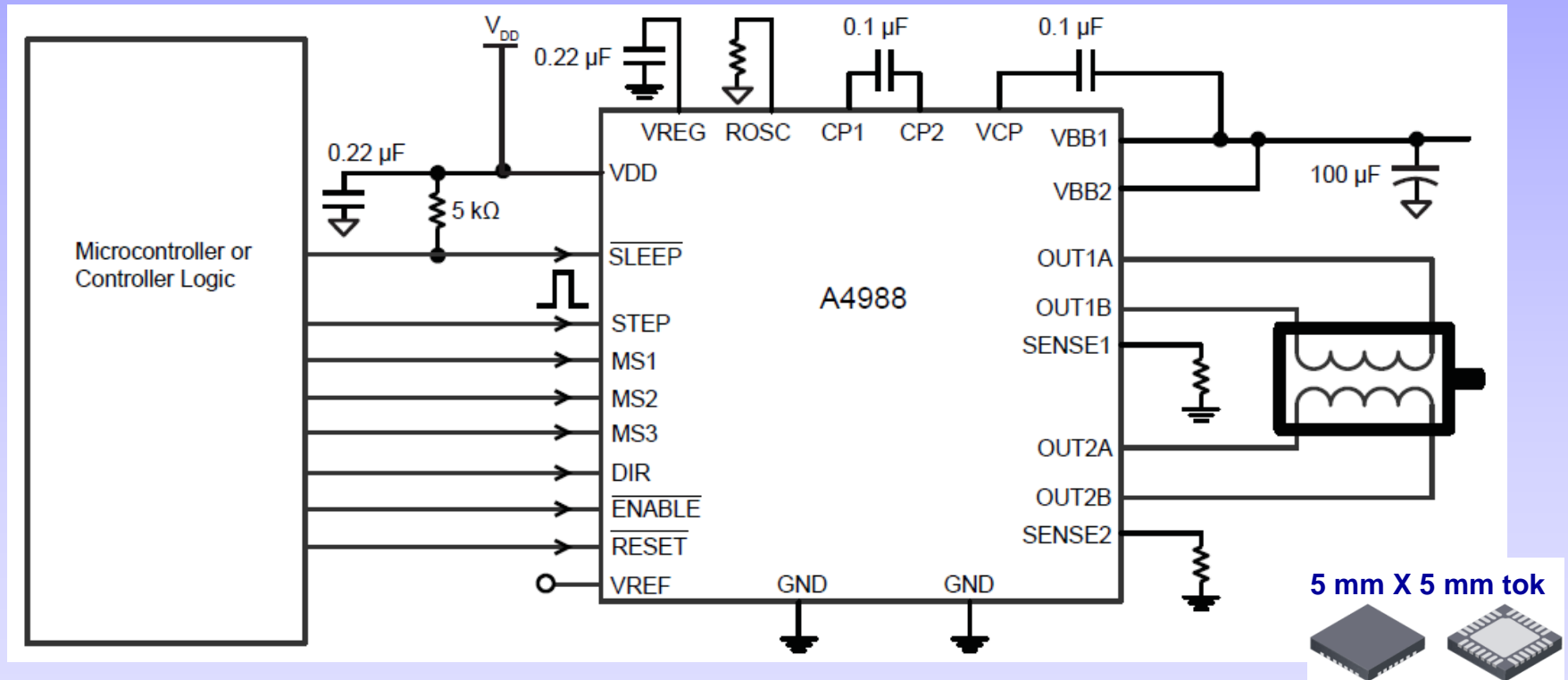
Dr. Soumelidis Alexandros

egyetemi docens

Bipoláris léptetőmotor vezérlő

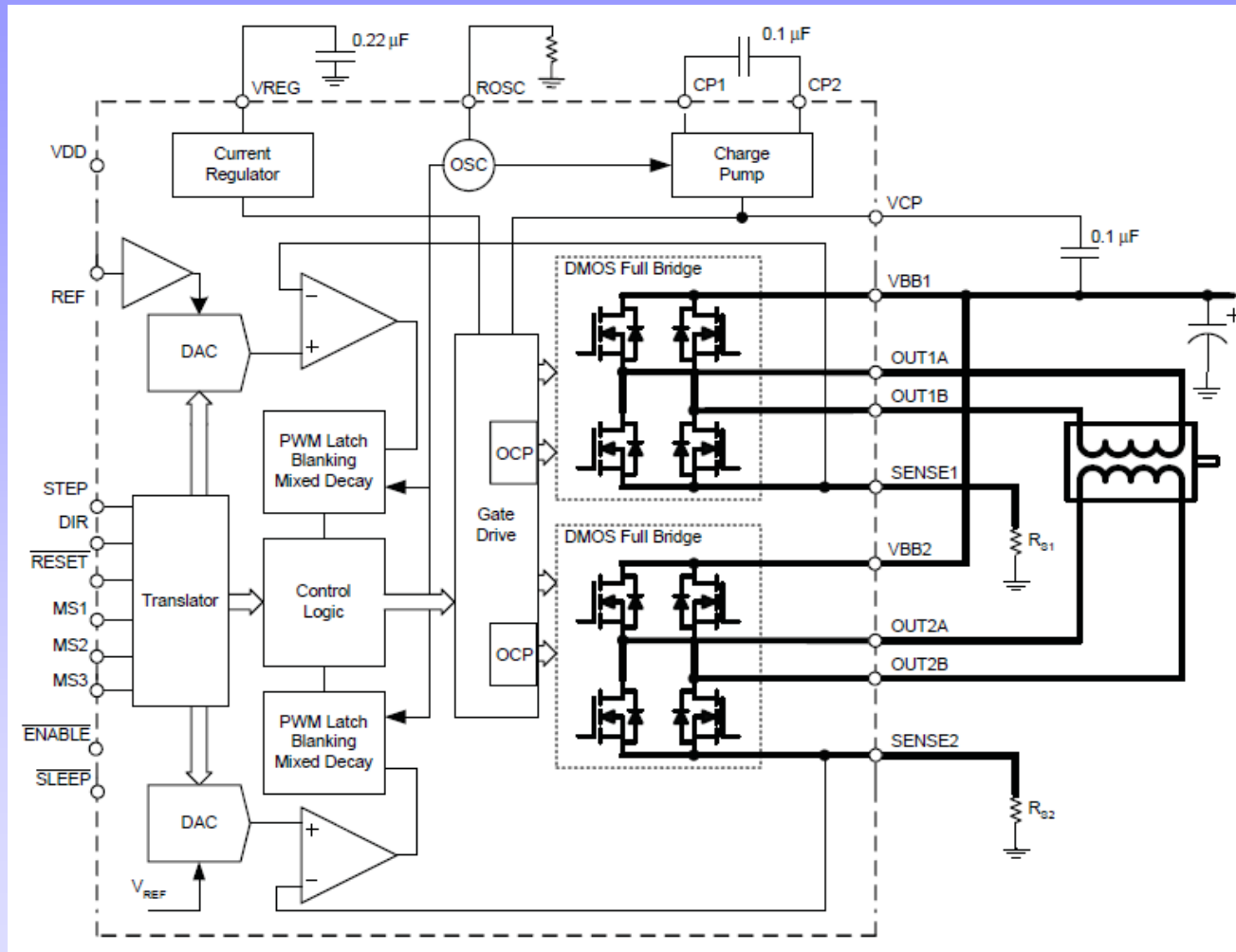


A4988 Microstepping Driver with Translator And Overcurrent Protection



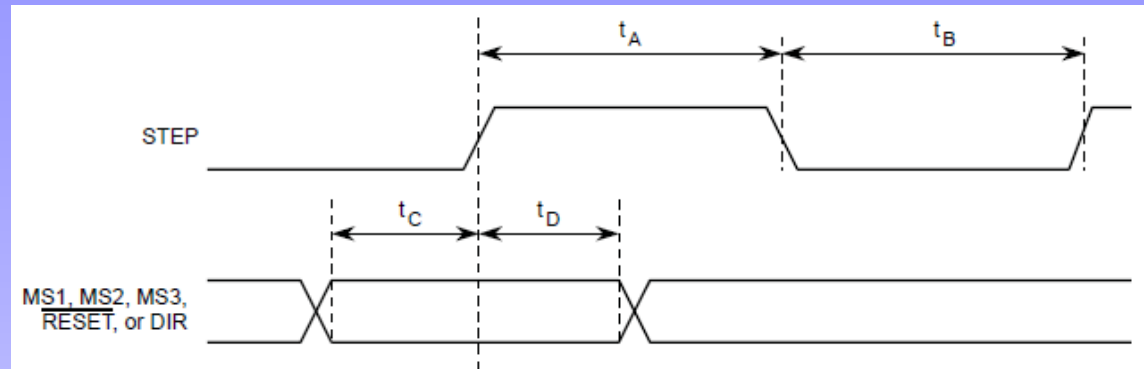
Bipoláris léptetőmotor vezérlő

A4988



Bipoláris léptetőmotor vezérlő

A4988



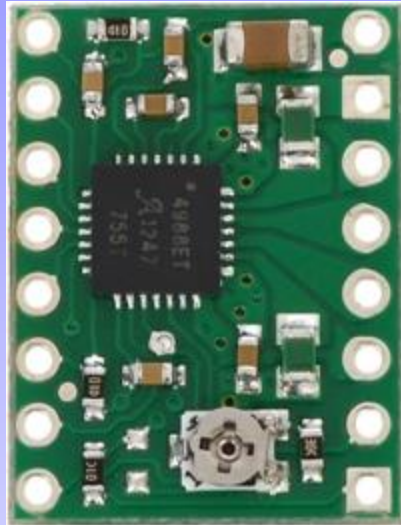
Time Duration	Symbol	Typ.	Unit
STEP minimum, HIGH pulse width	t_A	1	μs
STEP minimum, LOW pulse width	t_B	1	μs
Setup time, input change to STEP	t_C	200	ns
Hold time, input change to STEP	t_D	200	ns

MS1	MS2	MS3	Microstep Resolution	Excitation Mode
L	L	L	Full Step	2 Phase
H	L	L	Half Step	1-2 Phase
L	H	L	Quarter Step	W1-2 Phase
H	H	L	Eighth Step	2W1-2 Phase
H	H	H	Sixteenth Step	4W1-2 Phase

Bipoláris léptetőmotor vezérlő

Pololu A4988 kísérleti panel

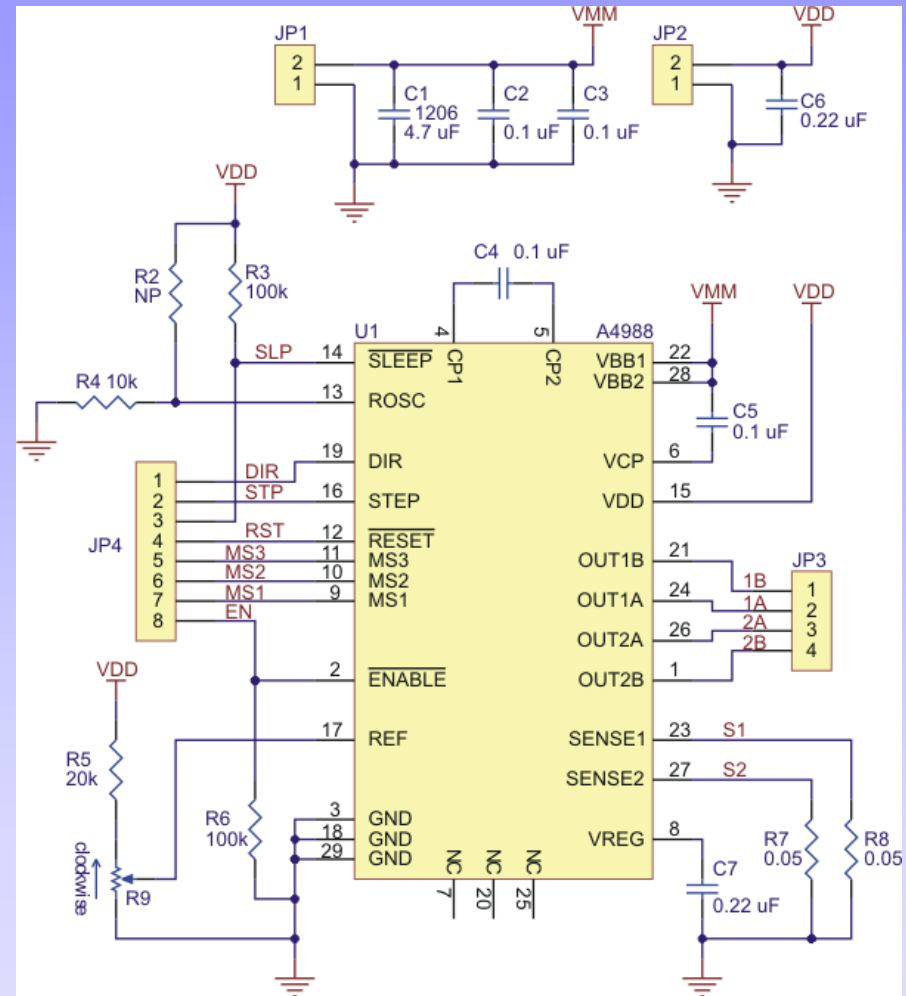
~ENABLE
MS1
MS2
MS3
~RESET
~SLEEP
STEP
DIR



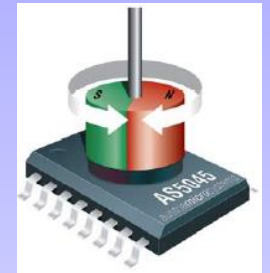
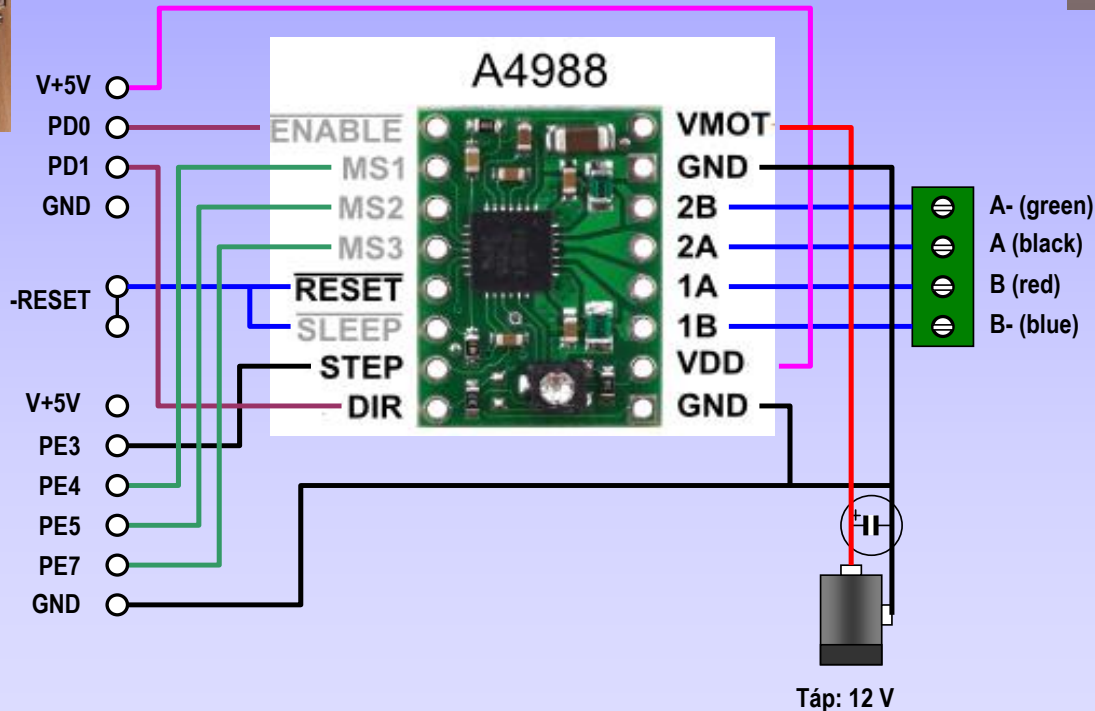
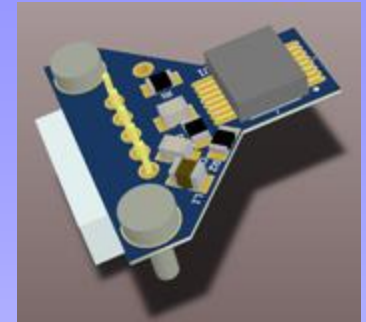
VMOT
GND
2B
2A
1A
1B
VDD
GND



<https://www.pololu.com/product/1182>



Bipoláris léptetőmotor vezérlő



Bipoláris léptetőmotor vezérlő



Switch	Operation	Signaling
SW1 Enable	<pre> graph LR Enable --> Disable </pre>	LED1 ON / Enable, OFF / Disable
SW2 Direction	<pre> graph LR Forward --> Reverse </pre>	LED2 ON / Forward, OFF / Reverse
SW3 Mode	<pre> graph LR FullStep --> HalfStep --> QuarterStep --> EighthStep --> SixteenthStep </pre>	Mode state is displayed on LCD
SW4 Single Step	Press SW action results in 1 step, further step after Release SW	LED3 ON if SW3 is pressed
SW5 Rotate	<pre> graph LR On --> Off </pre>	LED4 ON, OFF

Pin	Name	Signal1	Func1	Signal2	Func2	SignalU	IO	User Function	CN	Pin	CN	Pin
1	NC											
2	PE0	RXD0	USART	PDI	SPROG	UART0_RX	I	Serial USB FT232 Rx	12	2		
3	PE1	TXD0	USART	PDO	SPROG	UART0_TX	O	Serial USB FT232 Tx	12	3		
4	PE2	XCK0	USART	AIN0	ADC		O		12	4	13	8
5	PE3	OC3A	TIMER	AIN1	ADC	A4988_STEP	O	A4988_STEP	12	5	16	2
6	PE4	OC3B	TIMER	INT4	EXTINT	A4988_MS1	O	A4988 MS1	12	6	16	3
7	PE5	OC3C	TIMER	INT5	EXTINT	A4988_MS2	O	A4988 MS2	12	7	16	4
8	PE6	T3	TIMER	INT6	EXTINT		O		12	8	13	9
9	PE7	ICP3	TIMER	INT7	EXTINT	A4988_MS3	O	A4988 MS3	12	9	16	5
10	PB0	~SS	SPI			SPI_CS0	O		10	2	13	2
11	PB1	SCK	SPI			SPI_SCK	O	SPI - SCK	10	3	13	3
12	PB2	MOSI	SPI			SPI_MOSI	O	SPI - MOSI	10	4	13	4
13	PB3	MISO	SPI			SPI_MISO	I	SPI - MISO	10	5	13	5
14	PB4	OC2A	TIMER				O		10	6	13	6
15	PB5	OC1A	TIMER				O		10	7	14	2
16	PB6	OC1B	TIMER				O		10	8	14	3
17	PB7	OC1C	TIMER	OC0A	TIMER		O		10	9	14	4
18	PG3	TOSC2	TIMER			USR_SW3	I	User Switch 3	2	7		
19	PG4	TOSC1	TIMER			USR_SW4	I	User Switch 4	2	9		
20	~RESET								1	6		
21	VCC											
22	GND											
23	XTAL2											
24	XTAL1											
25	PD0	SCL	TWI	INT0	EXTINT	A4988_DIR	O	A4988 DIR	11	2	15	2
26	PD1	SDA	TWI	INT1	EXTINT	A4988_EN	O	A4988 ~ENABLE	11	3	15	3
27	PD2	RXD1	USART	INT2	EXTINT	UART1_RXD	I	UART1 ReCerve	11	4	6	3
28	PD3	TXD1	USART	INT3	EXTINT	UART1_TXD	O	UART1 Transmit	11	5	6	2
29	PD4	ICP1	TIMER				O		11	6	14	5
30	PD5	XCK1	USART	TXCAN	CAN	CAN_TX	O	CAN Transmit	11	7		
31	PD6	T1	TIMER	RXCAN	CAN	CAN_RX	I	CAN Receive	11	8		
32	PD7	T0	TIMER				O		11	9	13	7
33	PG0	~WR	ExtMEM			USR_SW0	I	User Switch 0	2	1		
34	PG1	~RD	ExtMEM			USR_SW1	I	User Switch 1	2	3		
35	PC0	A8	ExtMEM			USR_LED0	O	User LED 0	3	3		
36	PC1	A9	ExtMEM			USR_LED 1	O	User LED 1	3	5		
37	PC2	A10	ExtMEM			USR_LED 2	O	User LED 2	3	7		
38	PC3	A11	ExtMEM			USR_LED 3	O	User LED 3	3	9		
39	PC4	A12	ExtMEM			USR_LED 4	O	User LED 4	3	11		
40	PC5	A13	ExtMEM			USR_LED 5	O	User LED 5	3	13		
41	PC6	A14	ExtMEM			USR_LED 6	O	User LED 6	3	15		
42	PC7	A15	ExtMEM	CLK0	TIMER	USR_LED 7	O	User LED 7	3	17		
43	PG2	ALE	ExtMEM			USR_SW2	I	User Switch 2	2	5		
44	PA7	AD7	ExtMEM			LCD_D3	IO	Alphanumeric LCD D3				
45	PA6	AD6	ExtMEM			LCD_D2	IO	Alphanumeric LCD D2				
46	PA5	AD5	ExtMEM			LCD_D1	IO	Alphanumeric LCD D1				
47	PA4	AD4	ExtMEM			LCD_D0	IO	Alphanumeric LCD D0				
48	PA3	AD3	ExtMEM			LCD_BL	IO	Alphanumeric LCD BL				
49	PA2	AD2	ExtMEM			LCD_E	O	Alphanumeric LCD E				
50	PA1	AD1	ExtMEM			LCD_RW	I/O	Alphanumeric LCD R/W				
51	PA0	AD0	ExtMEM			LCD_RS	IO	Alphanumeric LCD ID				
52	VCC											
53	GND											
54	PF7	TDI	JTAG	ADC7	ADC	TDI	O	JTAG	1	9		
55	PF6	TDO	JTAG	ADC6	ADC	TDO	O	JTAG	1	3		
56	PF5	TMS	JTAG	ADC5	ADC	TMS	O	JTAG	1	5		
57	PF4	TCK	JTAG	ADC4	ADC	TCK	O	JTAG	1	1		
58	PF3			ADC3	ADC		O		4	9		
59	PF2			ADC2	ADC		O		4	7		
60	PF1			ADC1	ADC	ADC1_POT2	ai	Analog Input 1 - Potm 2	4	5		
61	PF0			ADC0	ADC	ADC0_POT1	ai	Analog Input 0 - Potm 1	4	3		
62	AREF											
63	GND											
64	AVCC											