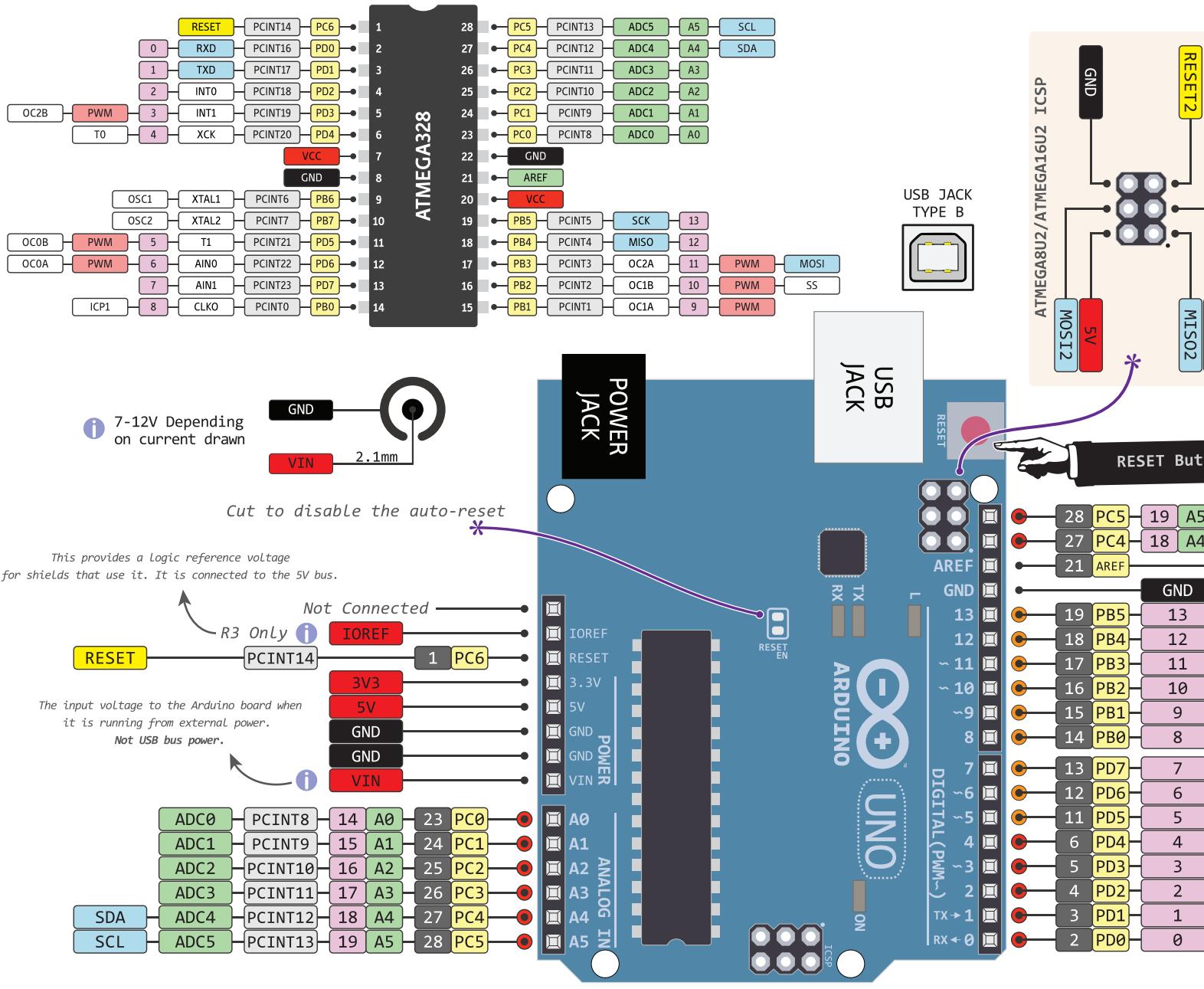


THE DEFINITIVE ARDUINO UNO PINOUT DIAGRAM

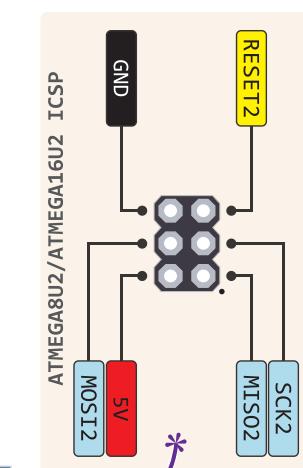


Absolute max per pin 40mA recommended 20mA

Absolute max 200mA for entire package

i R3 Only

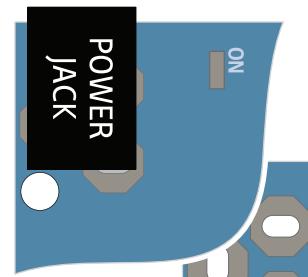
Connected to the ATMega and used for USB program and communicating with it



i R3 Only

THE DEFINITIVE ARDUINO LEONARDO PINOUT DIAGRAM

i 7-12V Depending on current drawn



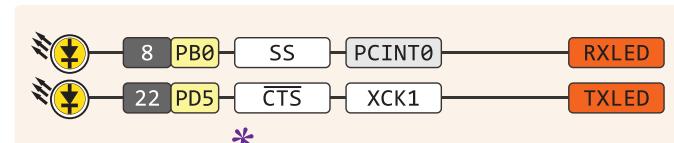
This provides a logic reference voltage for shields that use it. It is connected to the 5V bus.

i Not Connected
IOREF
RESET
3V3
5V
GND
GND
VIN

The input voltage to the Arduino board when it is running from external power.
Not USB bus power.

ADC7	TDI	14	A0	36	PF7
ADC6	TDO	15	A1	37	PF6
ADC5	TMS	16	A2	38	PF5
ADC4	TCK	17	A3	39	PF4
ADC1		18	A4	40	PF1
ADC0		19	A5	41	PF0

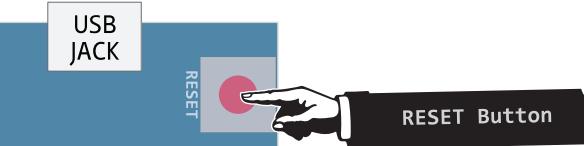
POWER
A0
A1
A2
A3
A4
A5



USB JACK Type Micro-B

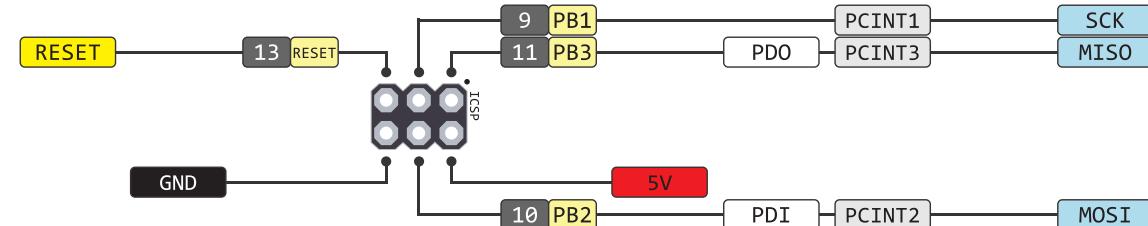
i Absolute max per pin 40mA recommended 20mA

STOP Absolute max 200mA for entire package



SCL same as Pin3
SDA same as Pin2

SCL	18	PD0	SCL	INT0	OC0B	PWM	SCL
SDA	19	PD1	SDA	INT1			SDA
AREF	42	AREF					AREF
GND			GND				
13	32	PC7	13	OC4A	ICP3	PWM	CLKO
12	26	PD6	12 A11	OC4D	ADC9	PWM	T1
~11	11						
~10	12	PB7	11	OC0A	OC1C	PWM	PCINT7 RTS
~9	30	PB6	10 A10	OC1B	ADC13	PWM	PCINT6 OC4B
8	29	PB5	9 A9	OC1A	ADC12	PWM	PCINT5 OC4B
	28	PB4	8 A8		ADC11		PCINT4
7	1	PE6	7 INT6	AIN0			
~6	27	PD7	6 A7	OC4D	ADC10	PWM	T0
5	31	PC6	5	OC3A	OC4A	PWM	
4	25	PD4	4 A6	ICP1	ADC8		
~3	18	PD0	3 INT0	OC0B	PWM	SCL	
2	19	PD1	2 INT1			SDA	
TX → 1	21	PD3	1 INT3	INT2	TXD1	TX	
RX ← 0	20	PD2	0 INT2	INT2	RXD1	RX	



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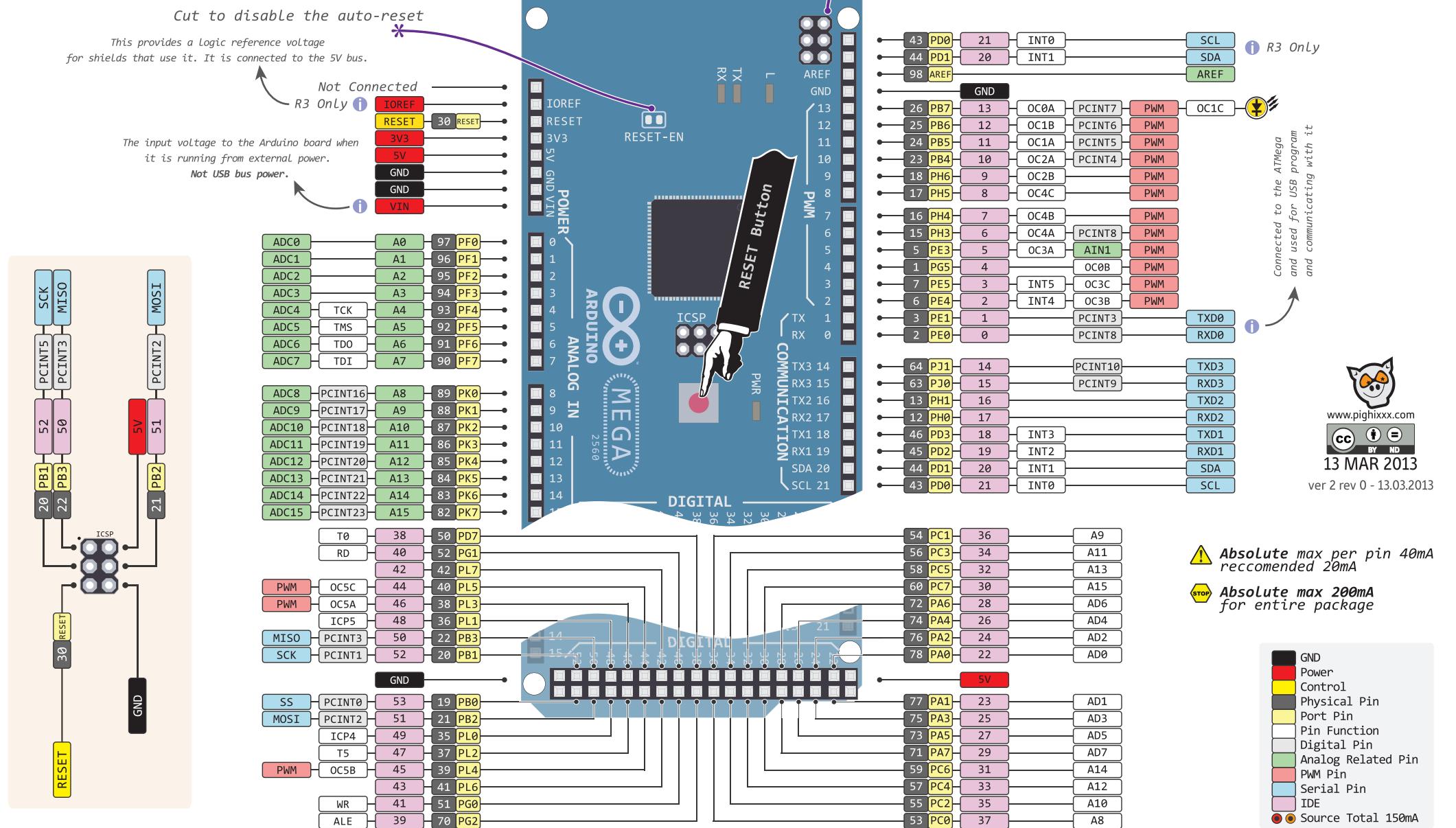
08 MAR 2013

ver 2 rev 0 - 08.03.2013

PWM type
PWM 10bit
PWM 8/16bit
PWM 16bit
PWM HS
PWM 8bit

GND
Power
Control
Physical Pin
Port Pin
Pin Function
Digital Pin
Analog Related Pin
PWM Pin
Serial Pin
IDE

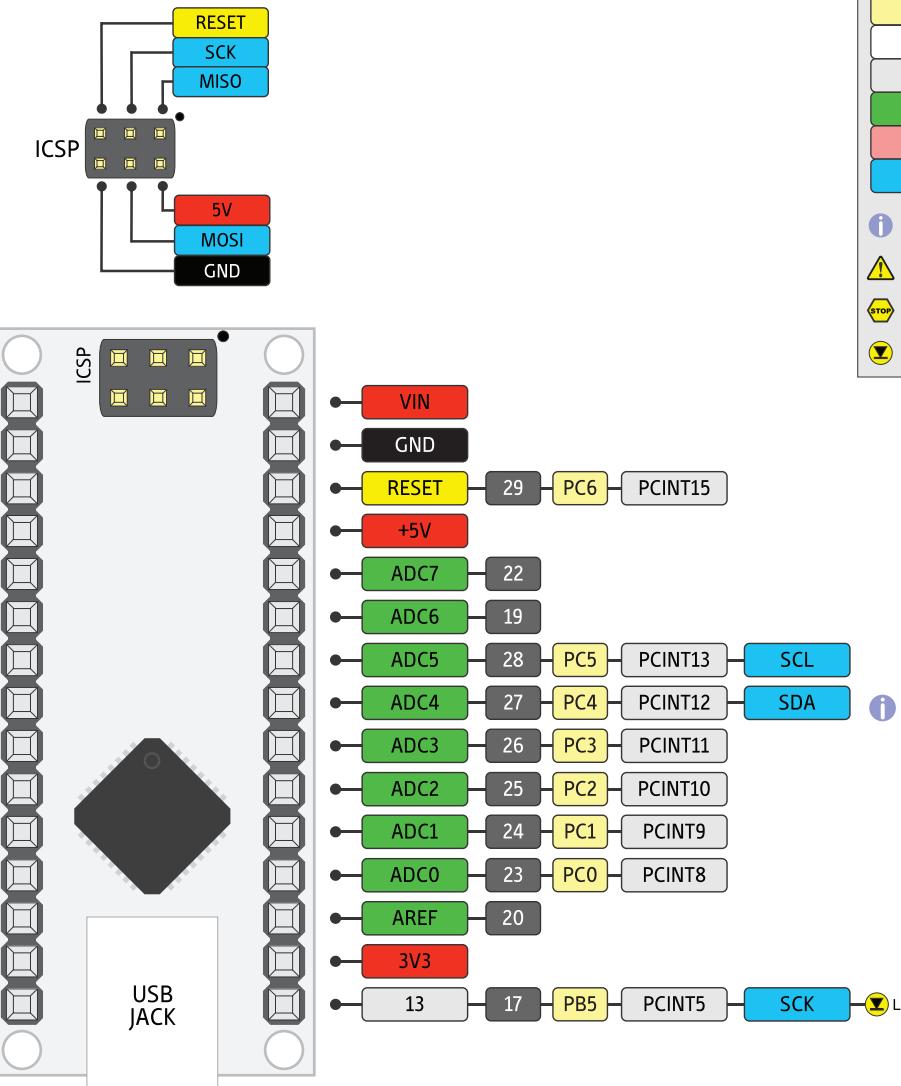
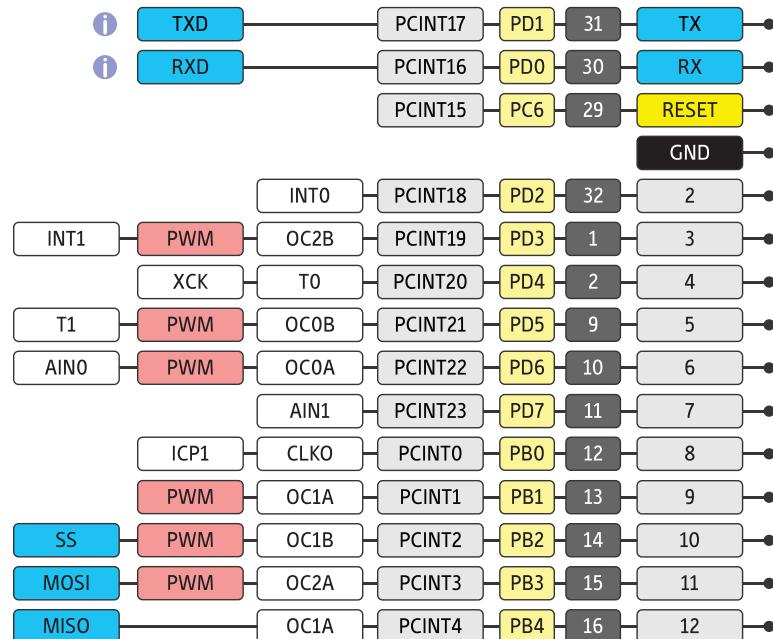
THE DEFINITIVE ARDUINO MEGA PINOUT DIAGRAM



THE
UNOFFICIAL
ARDUINO
NANO
PINOUT DIAGRAM

- ⚠ **Absolute max per pin 40mA** recommended 20mA
- ⚠ **Absolute max 200mA** for entire package

Connected to the ATmega
and used for USB program
and communicating with it



LEGEND	
—	GND
—	POWER
—	CONTROL
—	PHYSICAL PIN
—	PORT PIN
—	ATMEGA328 PIN FUNC
—	DIGITAL PIN
—	ANALOG-RELATED PIN
—	PWM PIN
—	SERIAL PIN
i	General Information
⚠	Pay Attention
⚠	No Really PAY ATTENTION
⚠	LED

i On version 2
Analog Pins are reversed
e.g. A0 \Rightarrow A7, A7 \Rightarrow A0

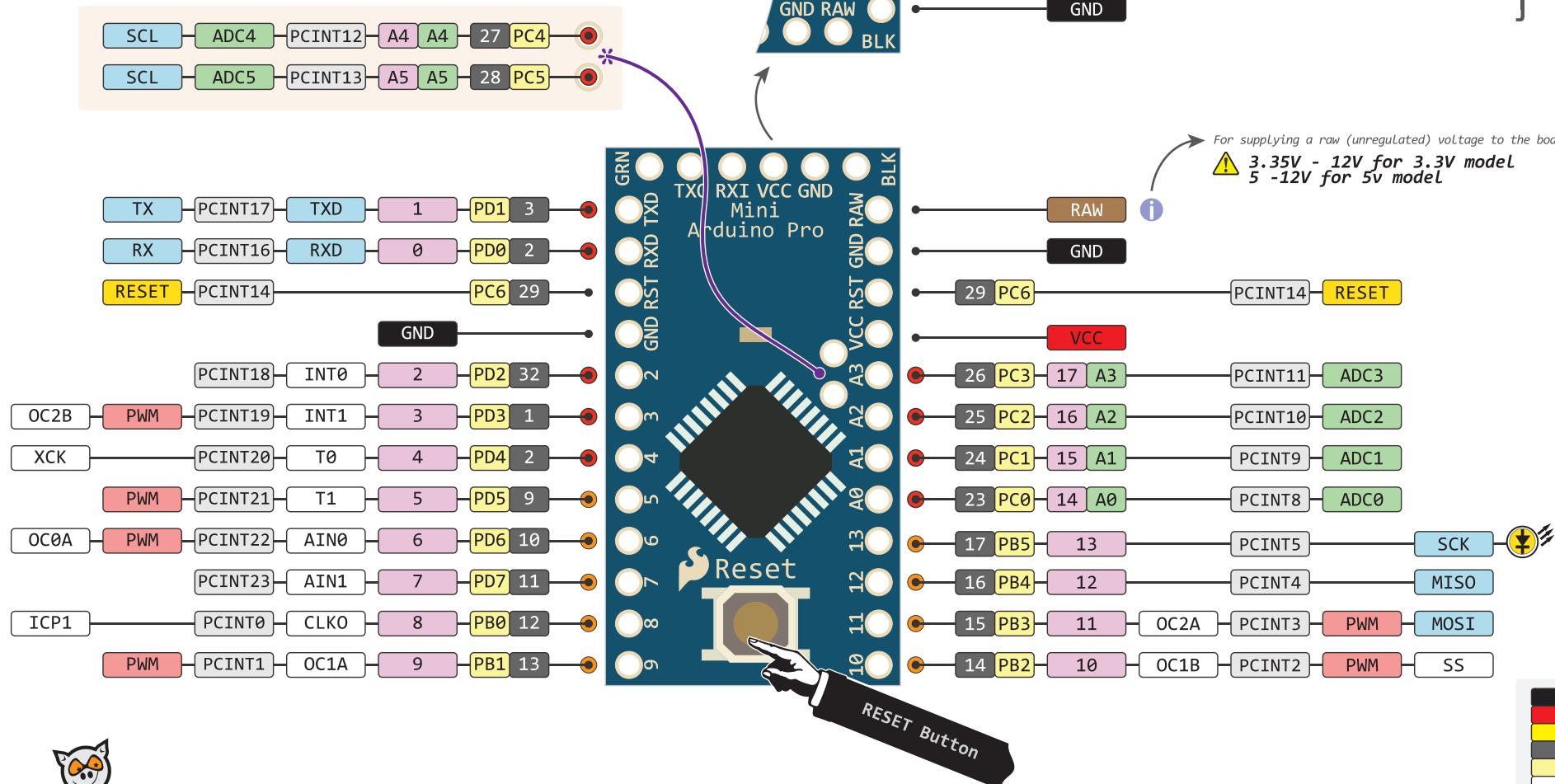


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07 FEB 2013

THE
UNOFFICIAL
ARDUINO
ProMini
PINOUT DIAGRAM



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08 MAR 2013

ver 1 rev 1 - 10.03.2013

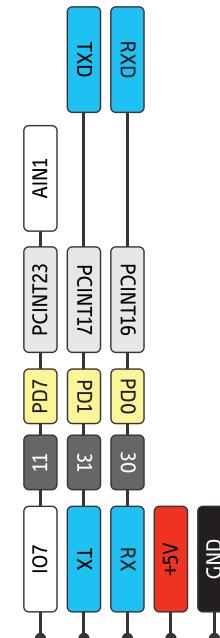
**Absolute max per pin 40mA
recommended 20mA**

**Absolute max 200mA
for entire package**

[Black square]	GND
[Red square]	Power
[Yellow square]	Control
[Grey square]	Physical Pin
[Light Blue square]	Port Pin
[Medium Blue square]	Pin Function
[Dark Blue square]	Digital Pin
[Green square]	Analog Related Pin
[Pink square]	PWM Pin
[Light Blue square]	Serial Pin
[Pink square]	IDE
[Yellow circle]	Source Total 150mA

THE
UNOFFICIAL
ARDUINO
MINI
PINOUT DIAGRAM

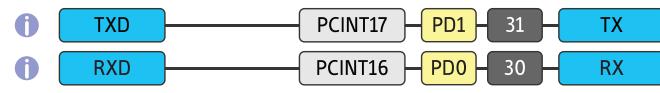
LEGEND	
GND	
POWER	
CONTROL	
PHYSICAL PIN	
PORT PIN	
ATMEGA328 PIN FUNC	
DIGITAL PIN	
ANALOG-RELATED PIN	
PWM PIN	
SERIAL PIN	
	General Information
	Pay Attention
	No Really PAY ATTENTION



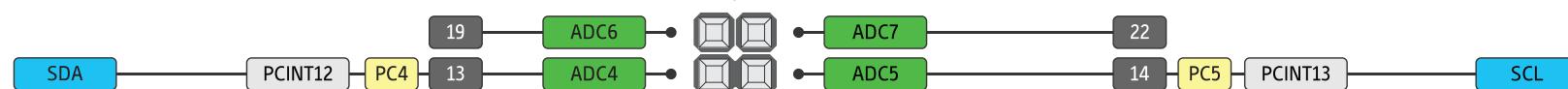
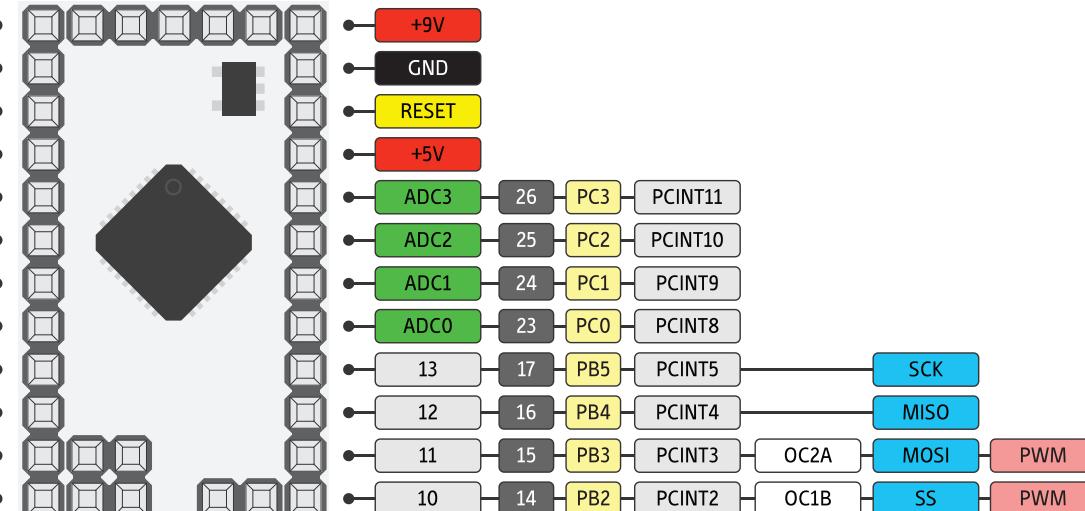
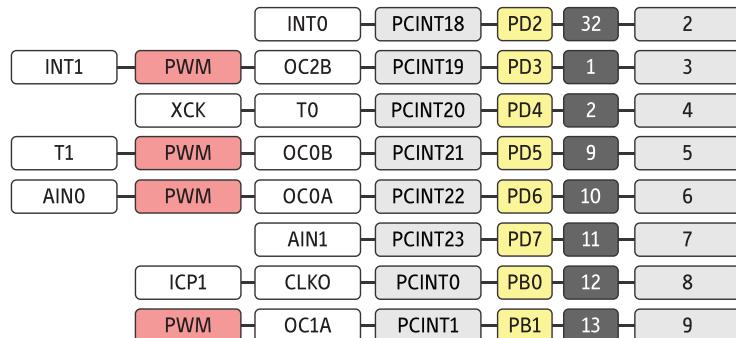
Absolute max per pin 40mA recommended 20mA

Absolute max 200mA for entire package

Connected to the ATmega and used for USB program and communicating with it



Rev <4 RESET is GND and GND is n.c.

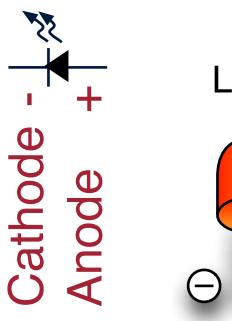


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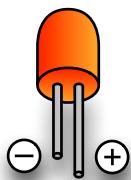


BY PIGHIXXX

07 FEB 2013

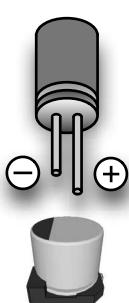
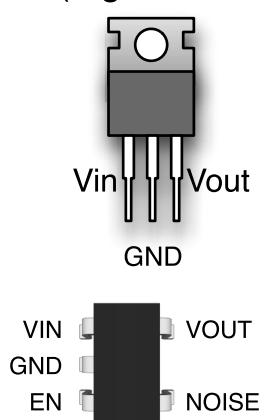


LED



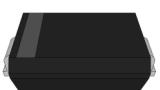
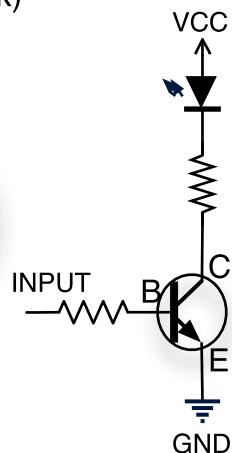
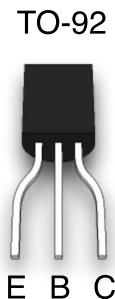
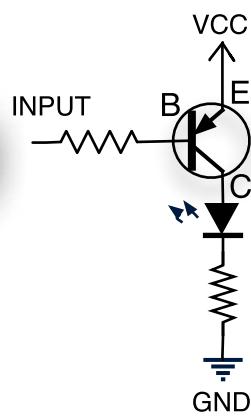
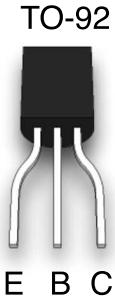
Marked by color or dot

CAPACITOR

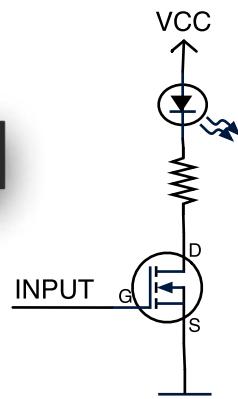
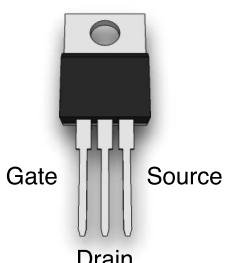
REGULATOR
(e.g. LM78xx)**Resistor**

	Digit	Multiplier	Tolerance
Silver	-	0.01	±10%
Gold	-	0.1	±5%
Black	0	1	-
Brown	1	10	±1%
Red	2	100	±2%
Orange	3	1k	-
Yellow	4	10k	-
Green	5	100k	±0.5%
Blue	6	1M	±0.25%
Violet	7	10M	±0.1%
Gray	8	-	-
White	9	-	-

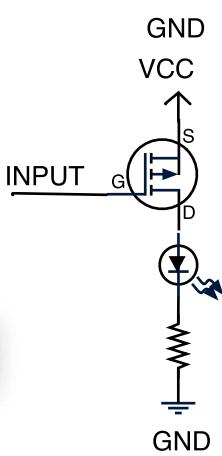
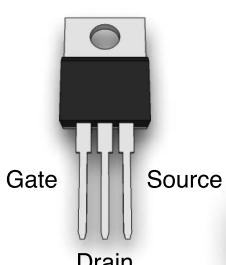
DIODE

NPN transistor (Current sink)
(e.g. PN2222)PNP transistor (Current source)
(e.g. PN2907)

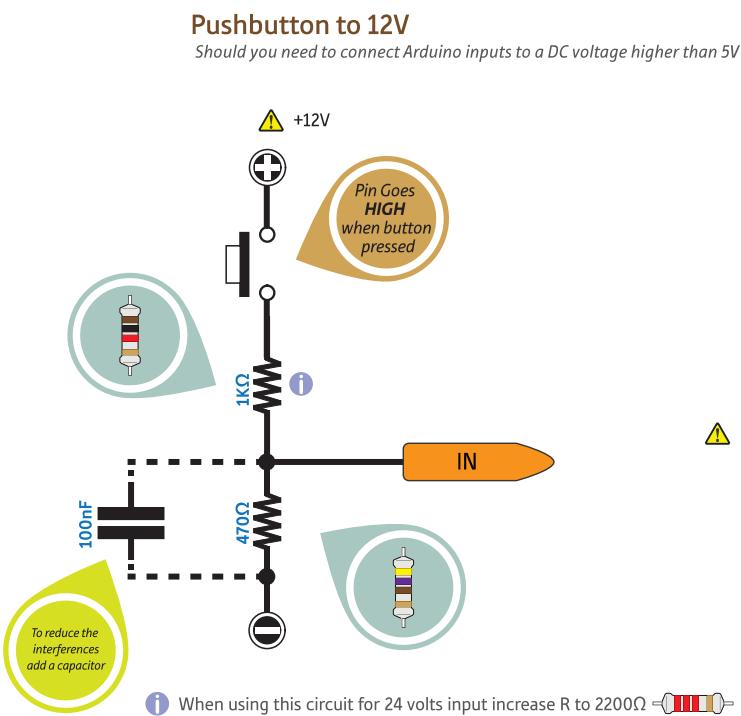
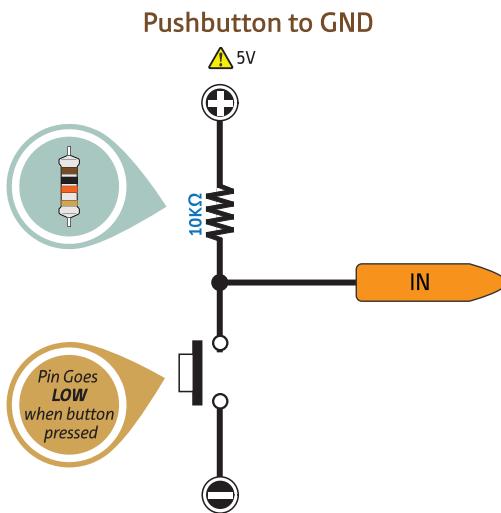
N-channel MOSFET



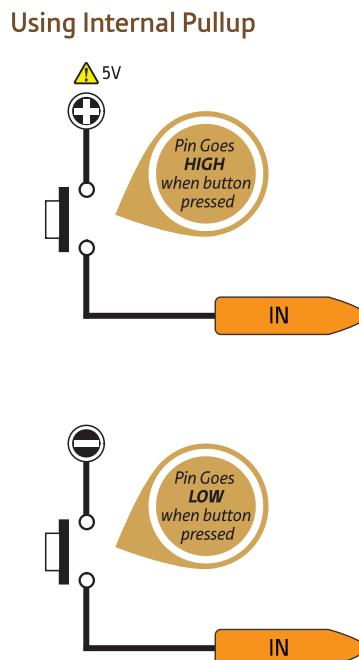
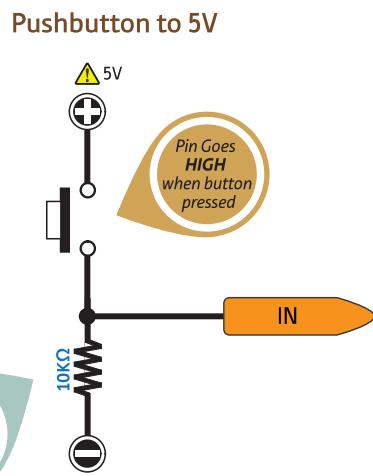
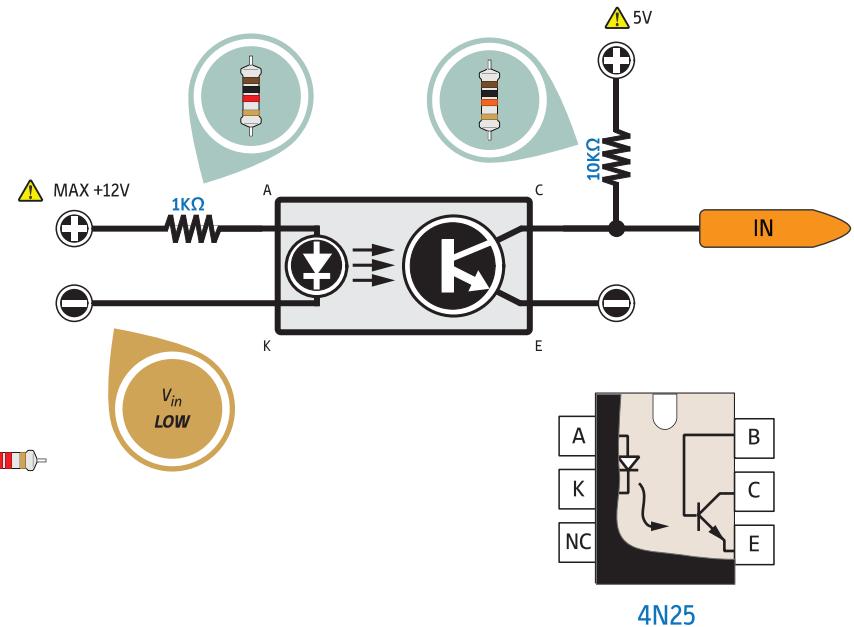
P-channel MOSFET



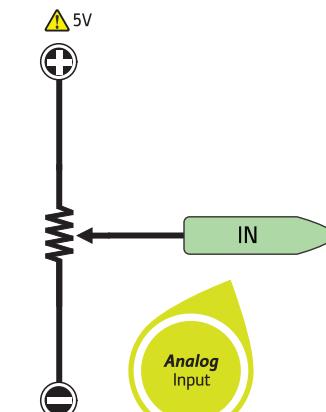
* Please note that some components may have a different pinout than the one showed above, you should always check the data sheet before using a new component.



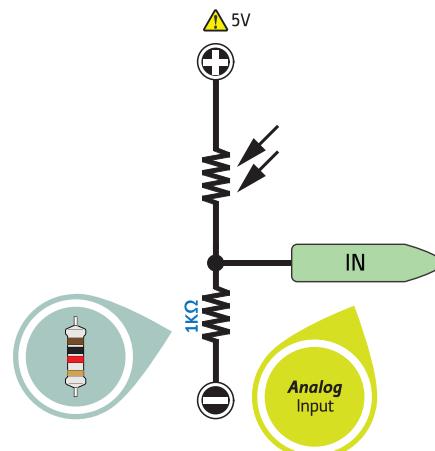
Optocoupled inputs
Used when galvanic separation between external circuitry and Arduino circuit is required

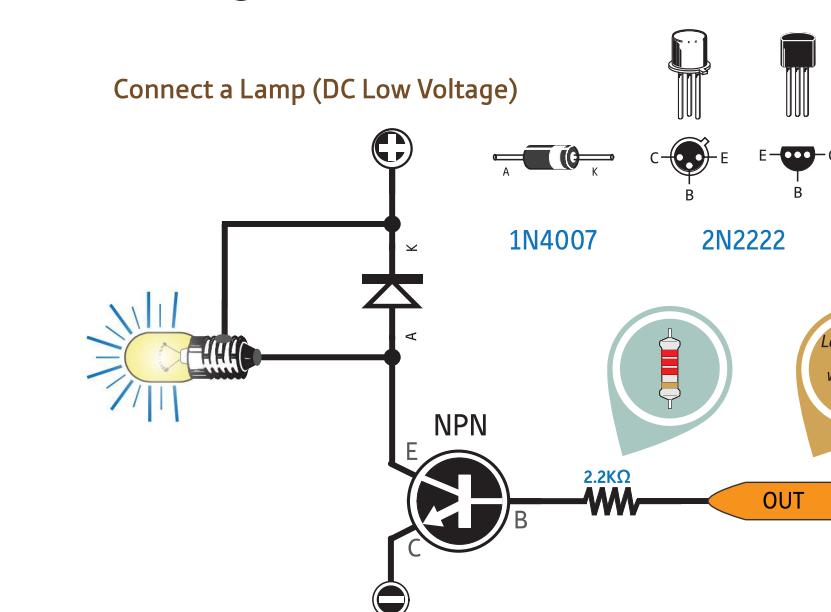
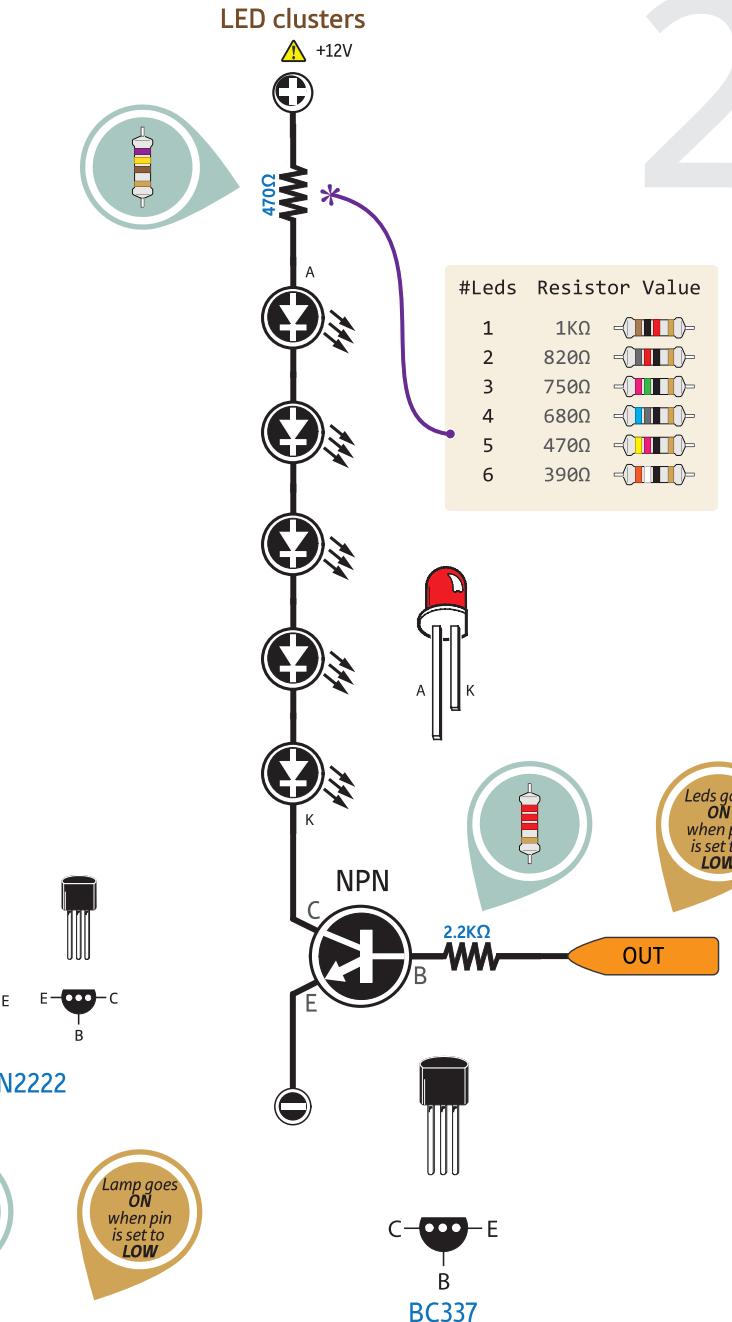
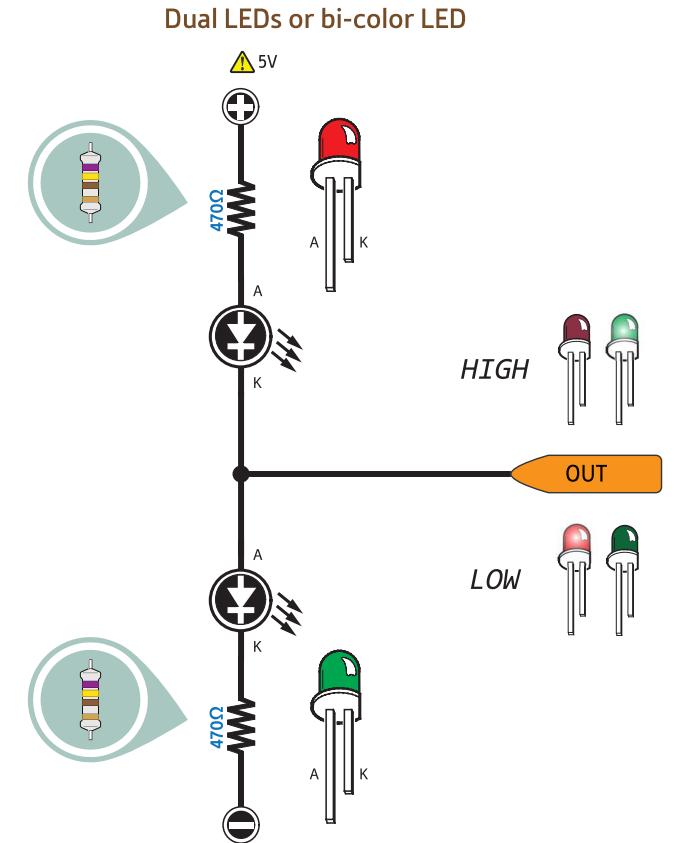
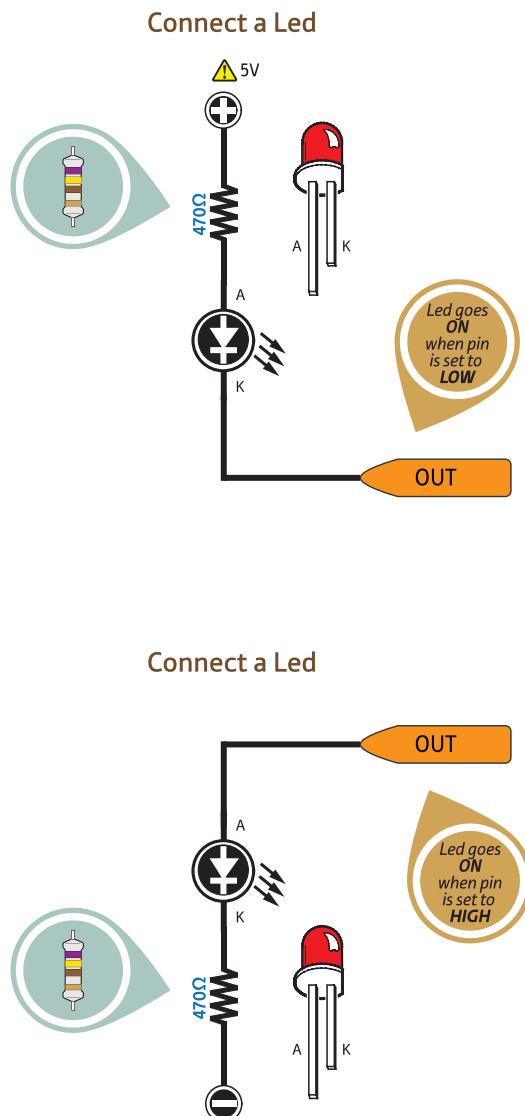


Trimmer or Potentiometer

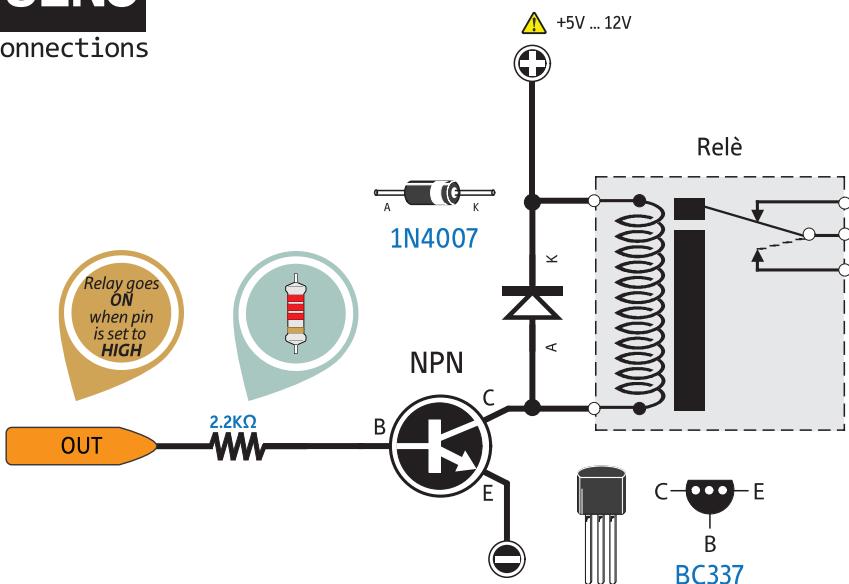


Photoresistor





Connect a Relay



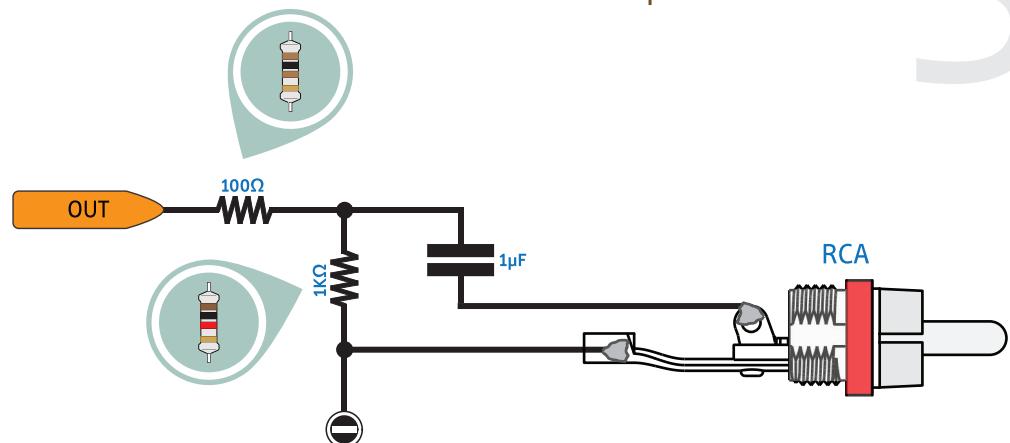
Relay goes ON when pin is set to HIGH

NPN

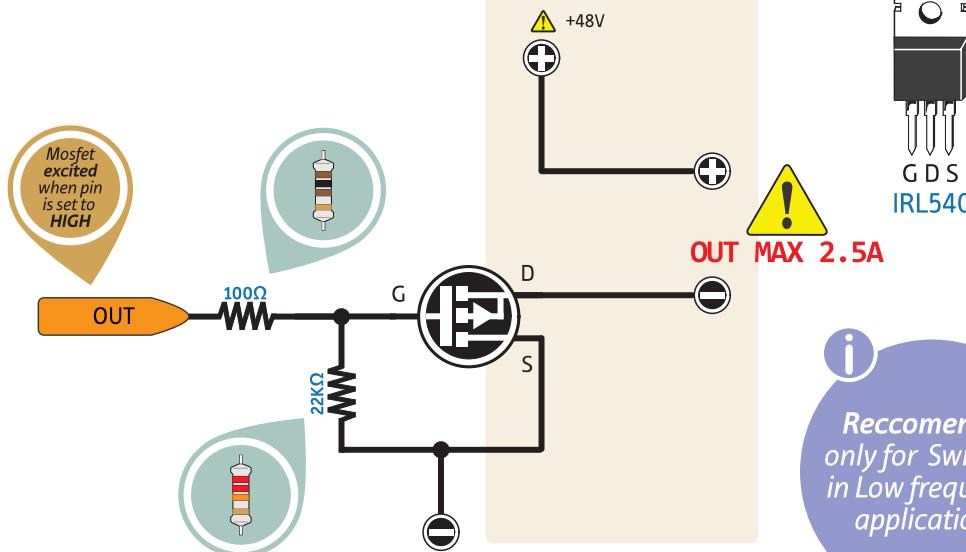
1N4007

BC337

Connect an Audio Amplifier



Connect a Mosfet



Mosfet excited when pin is set to HIGH

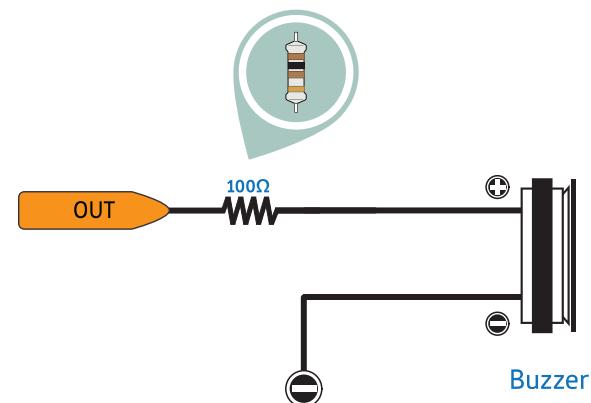
G D S
IRL540

OUT MAX 2.5A



Reccomended only for Switch or in Low frequency applications.

Connect a Buzzer



Buzzer



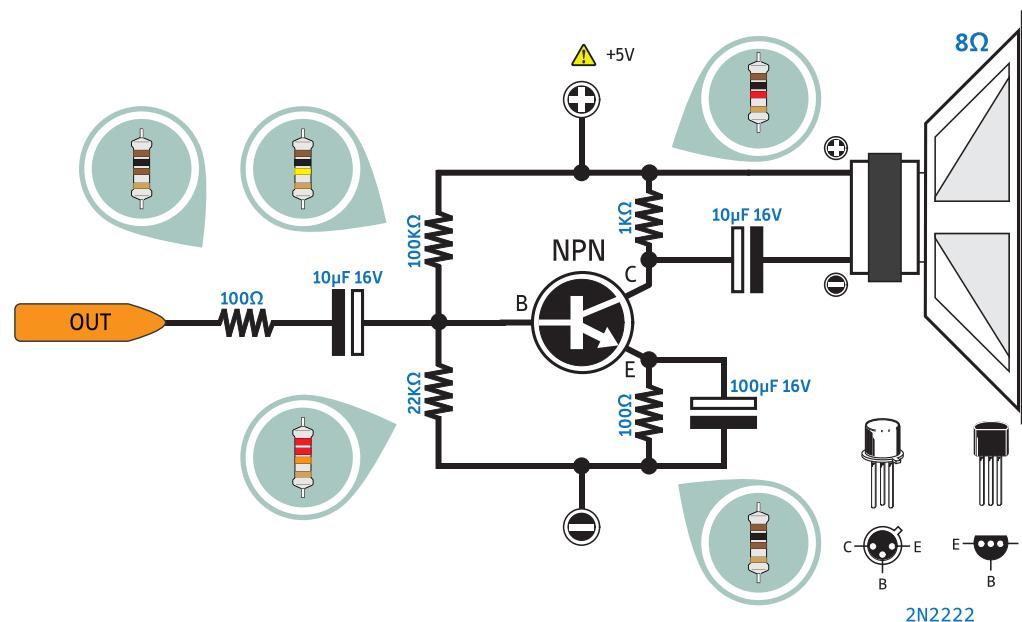
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03 APR 2013

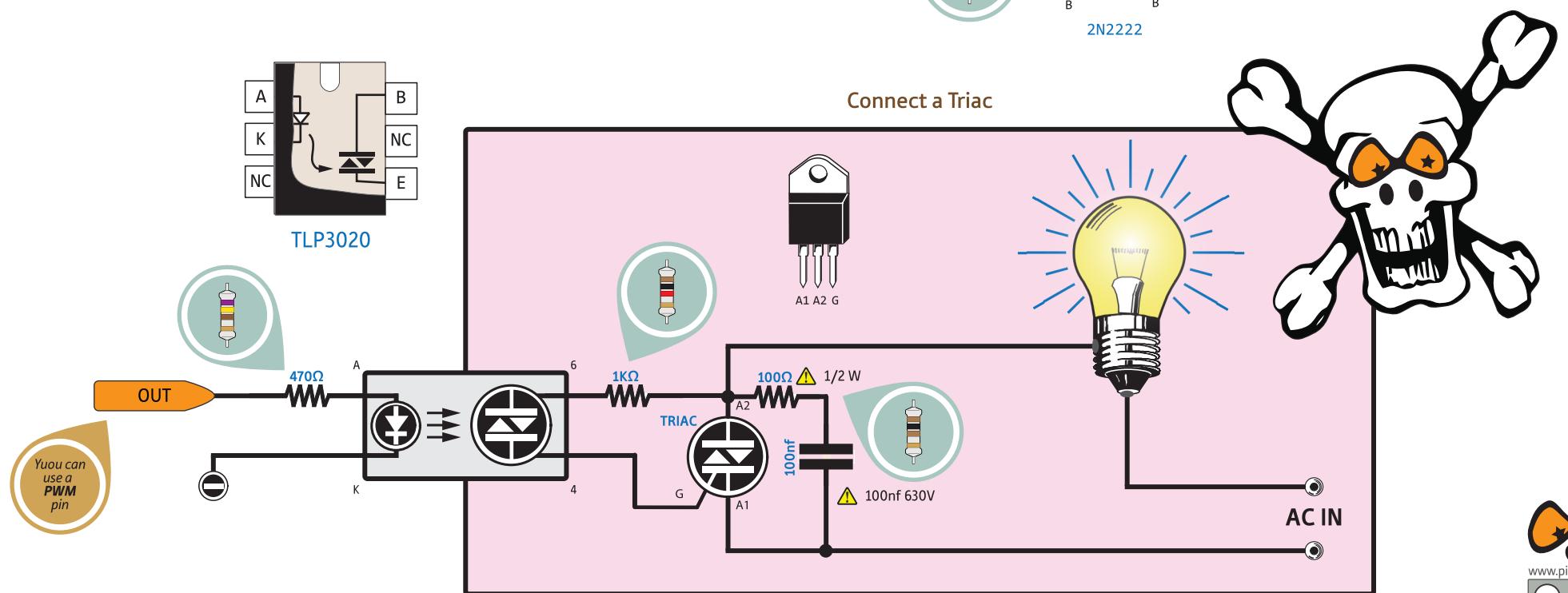
ver 1 rev 0

Connect a Speaker

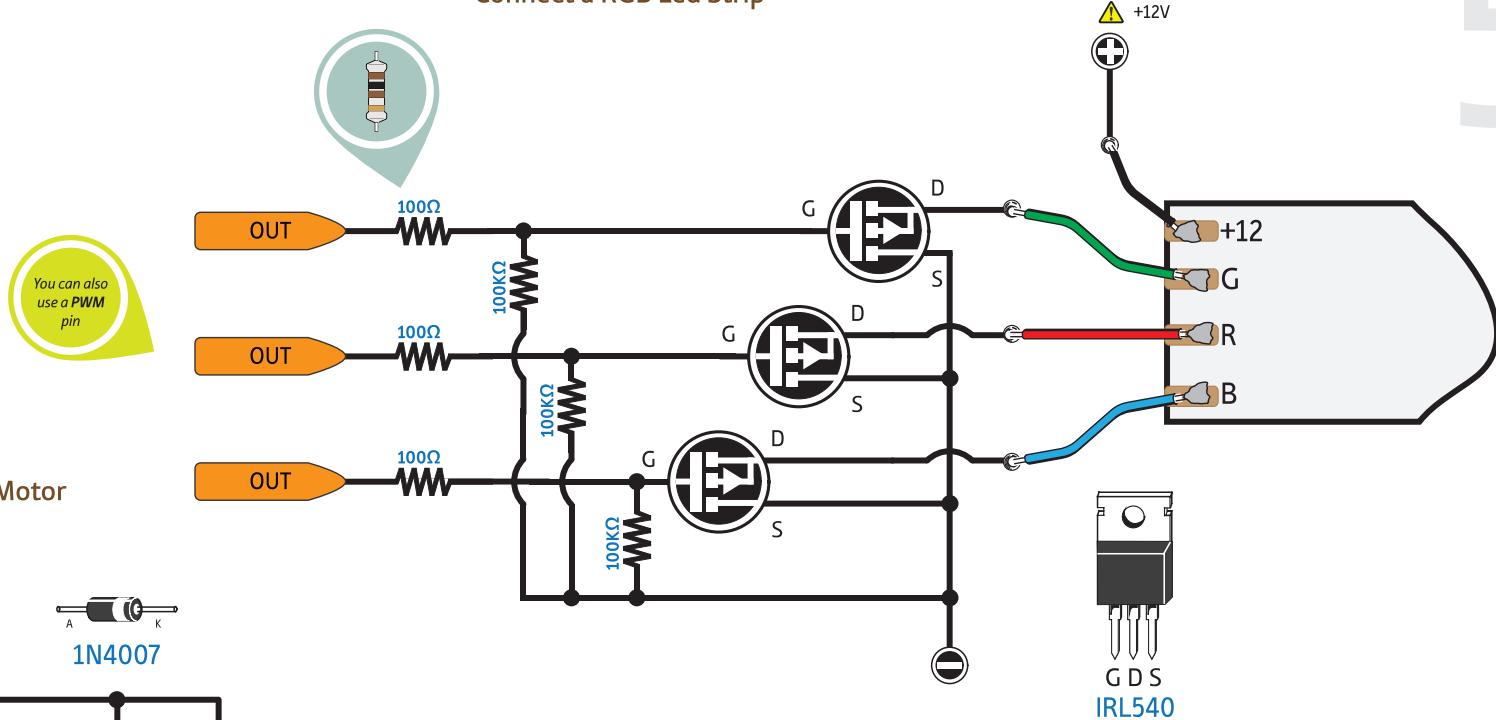


2N2222

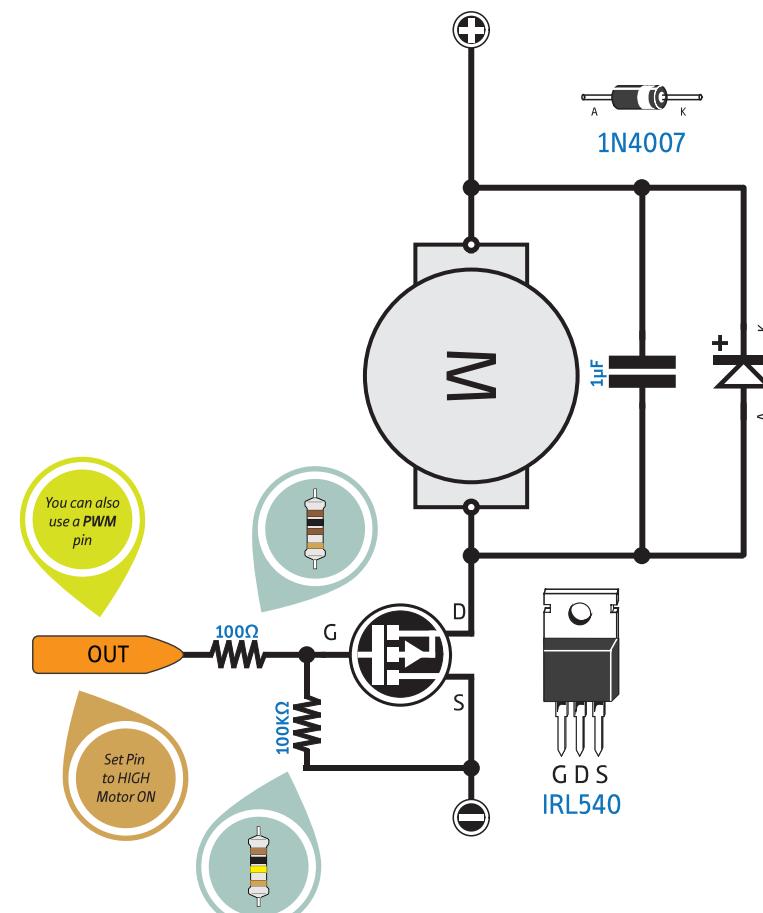
Connect a Triac



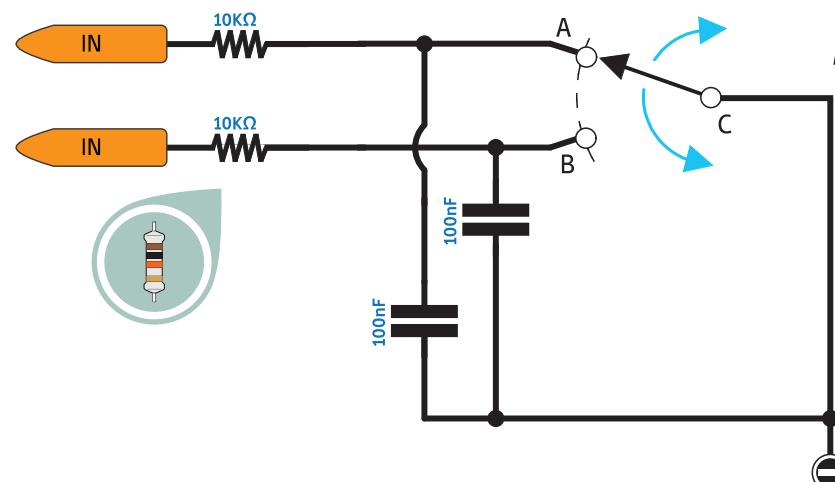
Connect a RGB Led Strip



Connect a DC Motor



Connect an Encoder



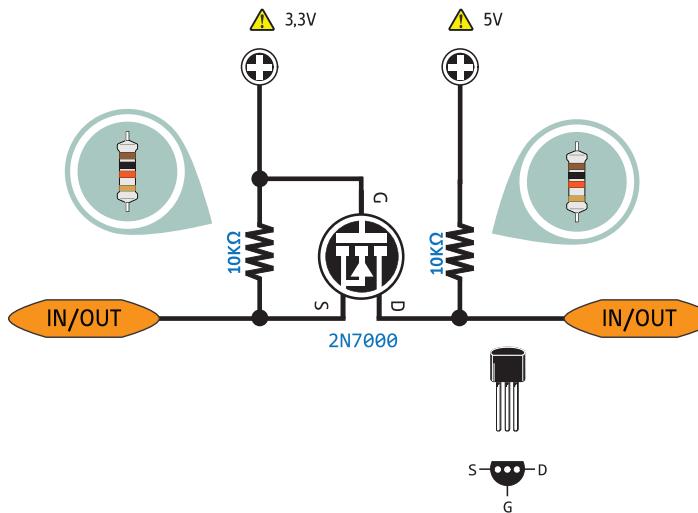
www.pighixxx.com



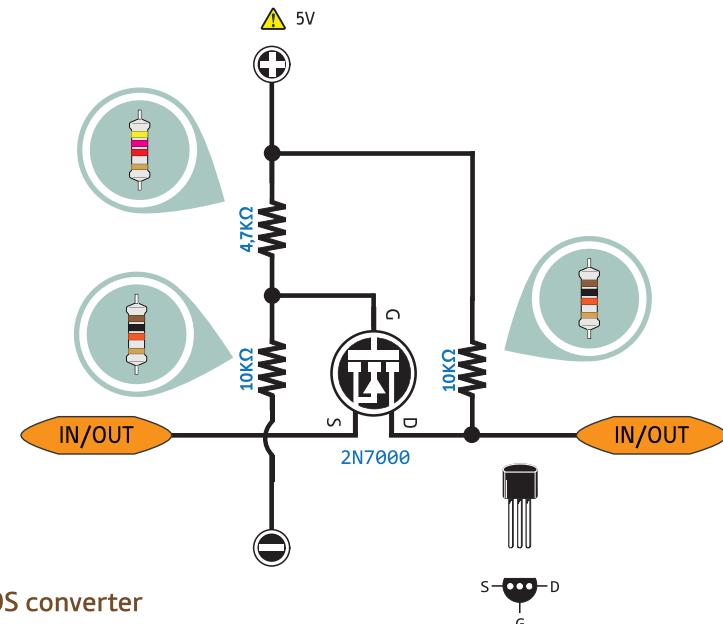
03 APR 2013

ver 1 rev 0

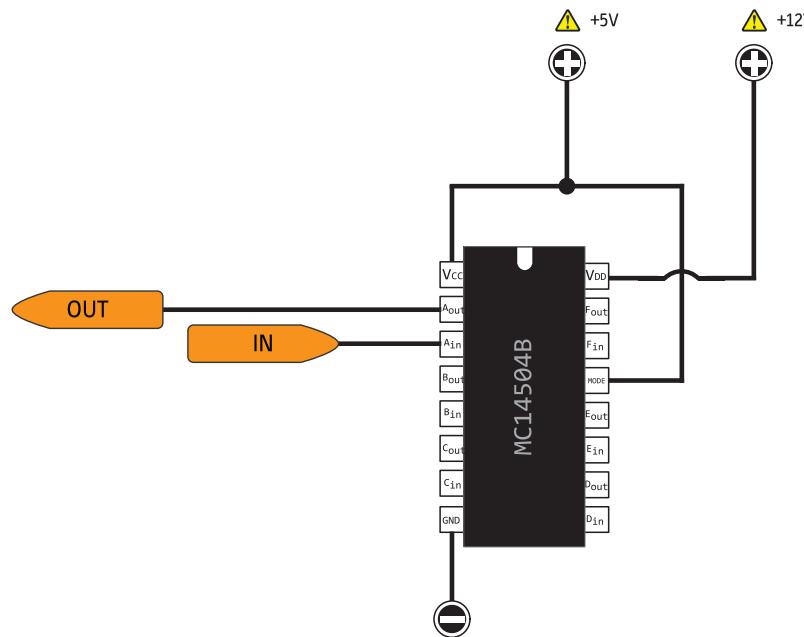
Bi-Directional Voltage Level Converter 3.3V to 5V



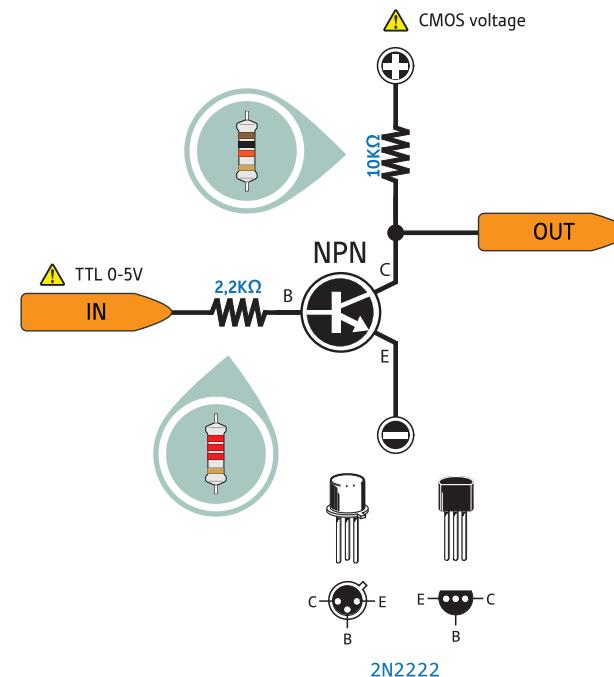
Bi-Directional Voltage Level Converter 3.3V to 5V with voltage divider



TTL / CMOS converter (6 inputs/outputs)



TTL / CMOS converter



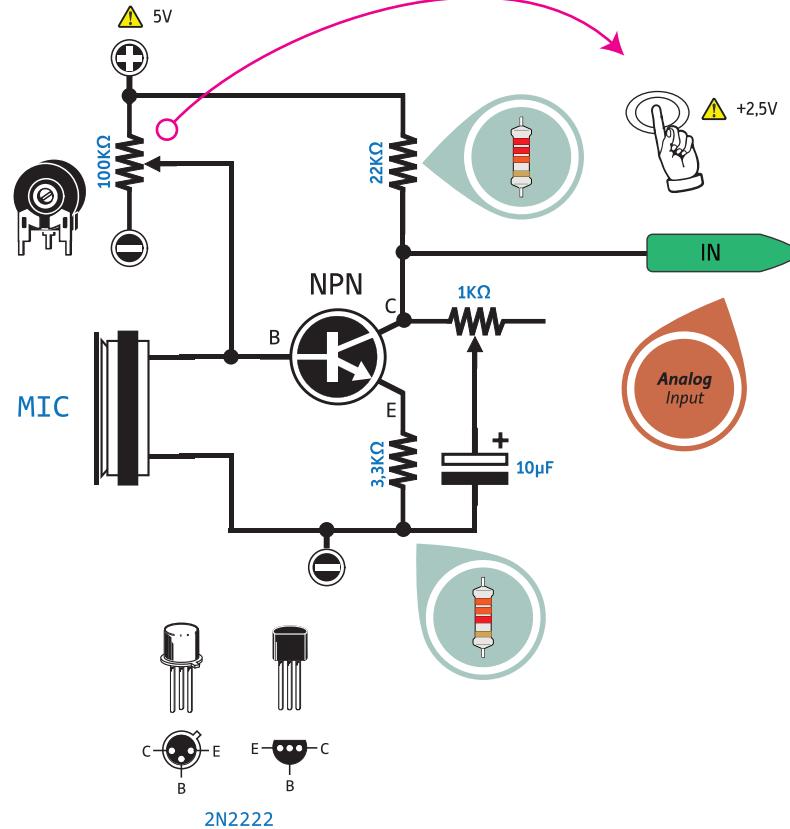
www.pighixx.com



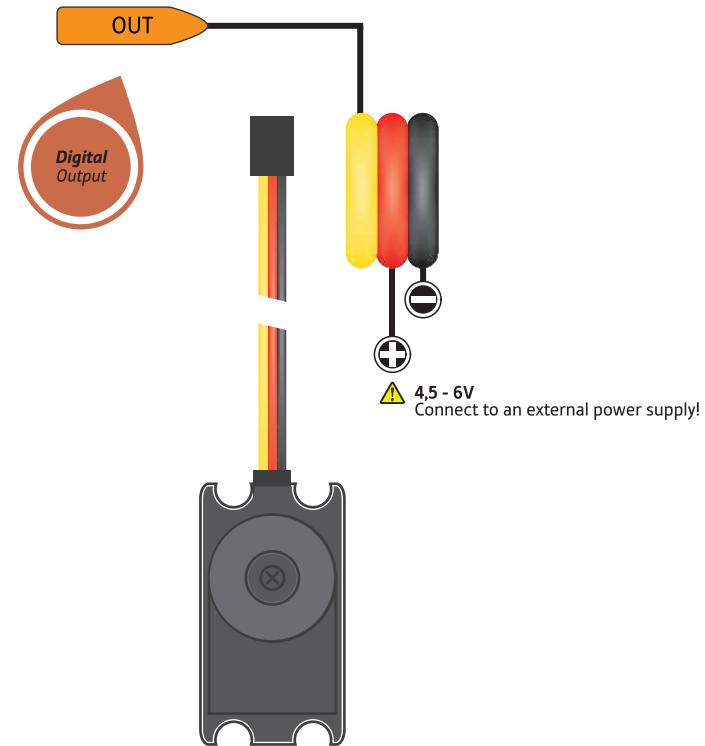
03 APR 2013

ver 1 rev 0

Connect a Microphone



Connect a Servo



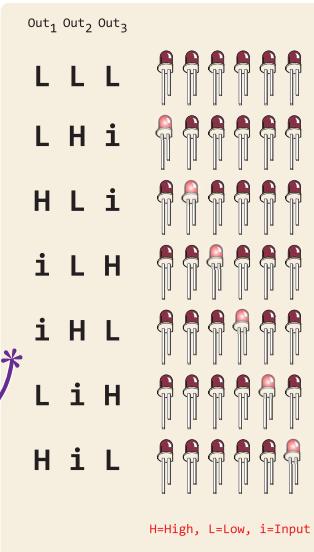
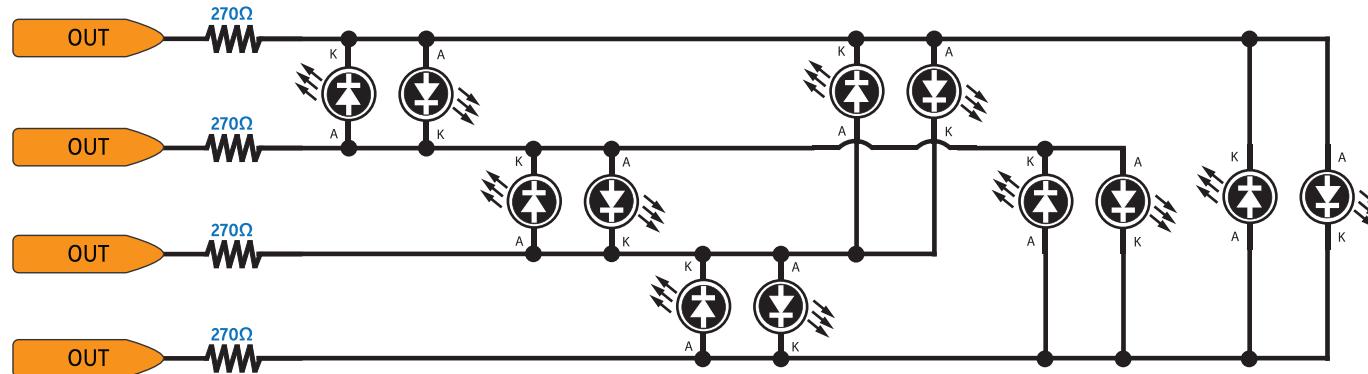
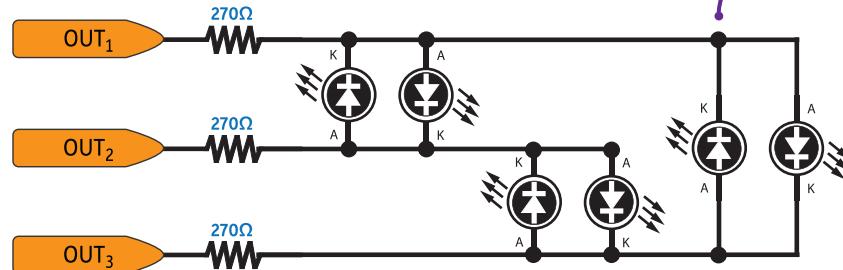
www.pighixxx.com



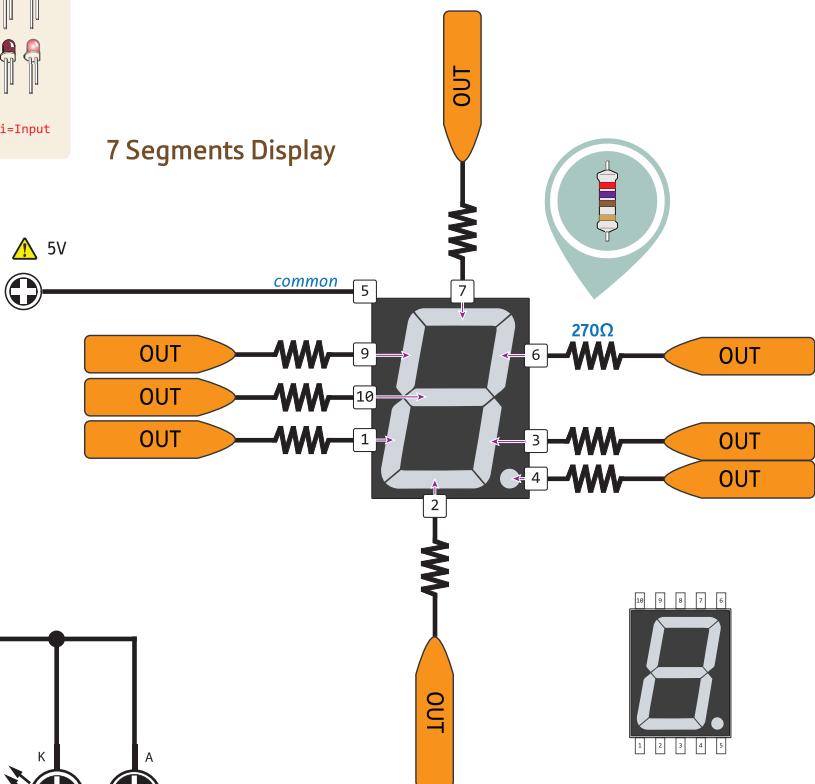
03 APR 2013

ver 1 rev 0

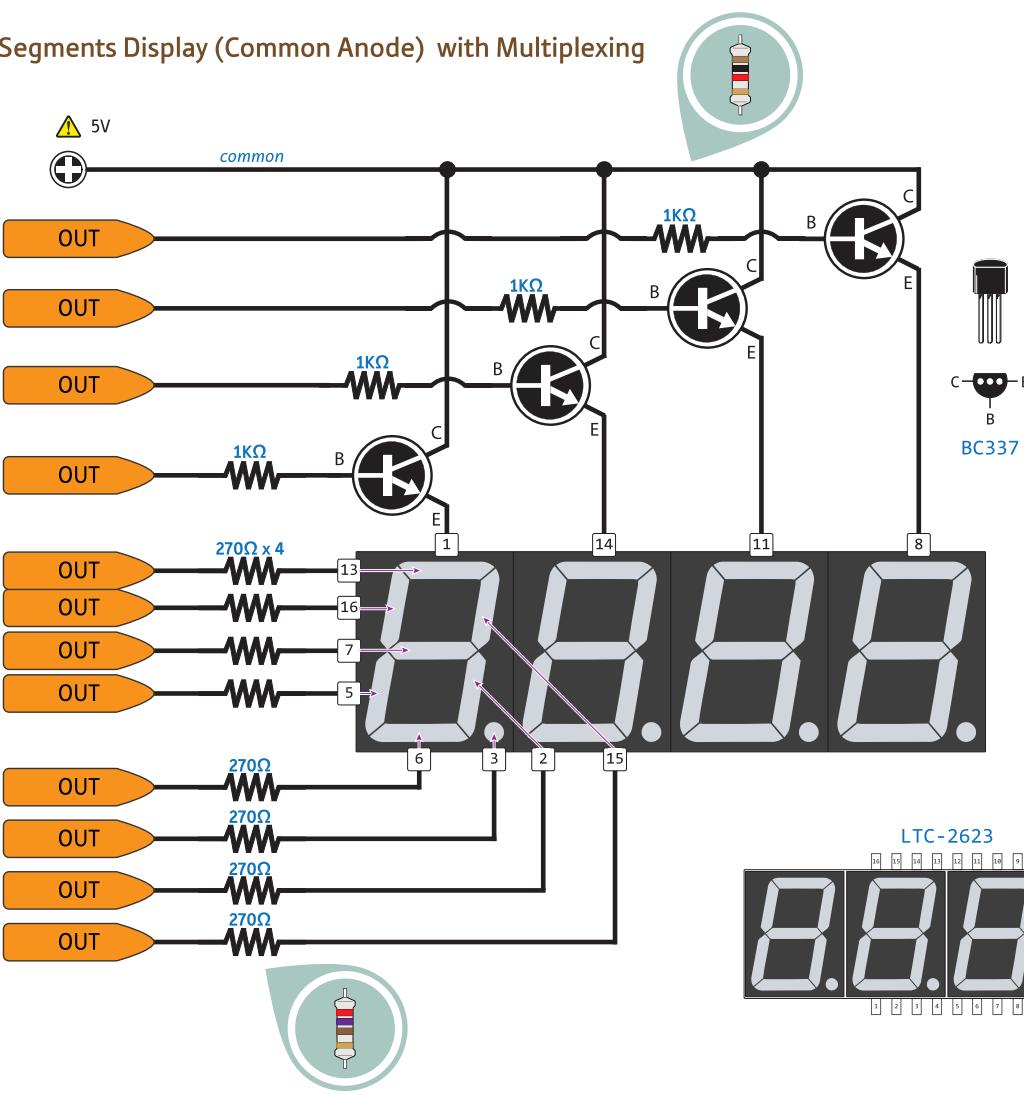
Charlieplexing



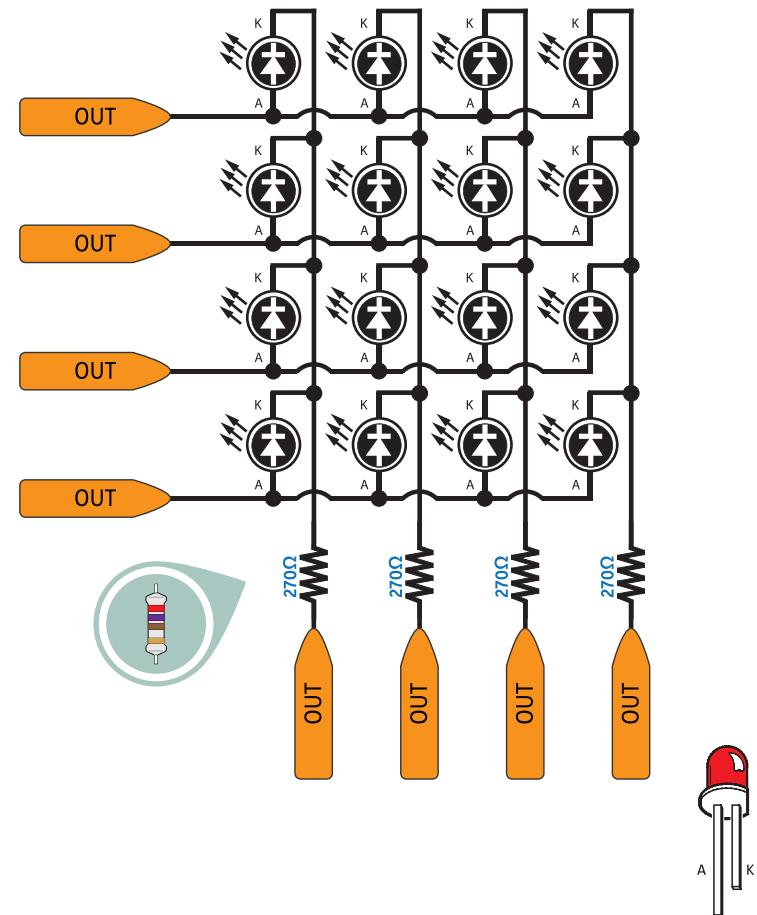
7 Segments Display



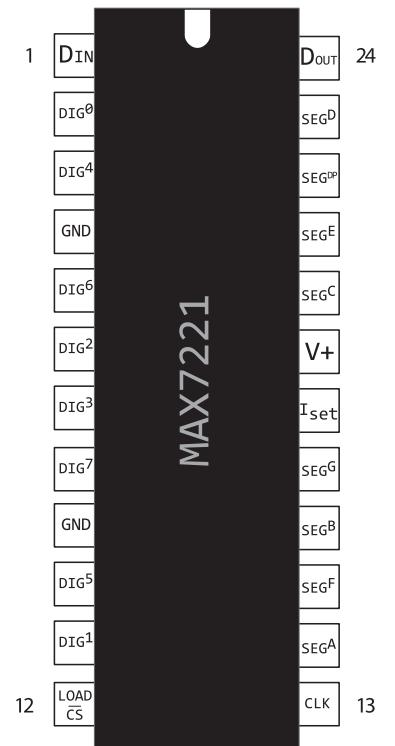
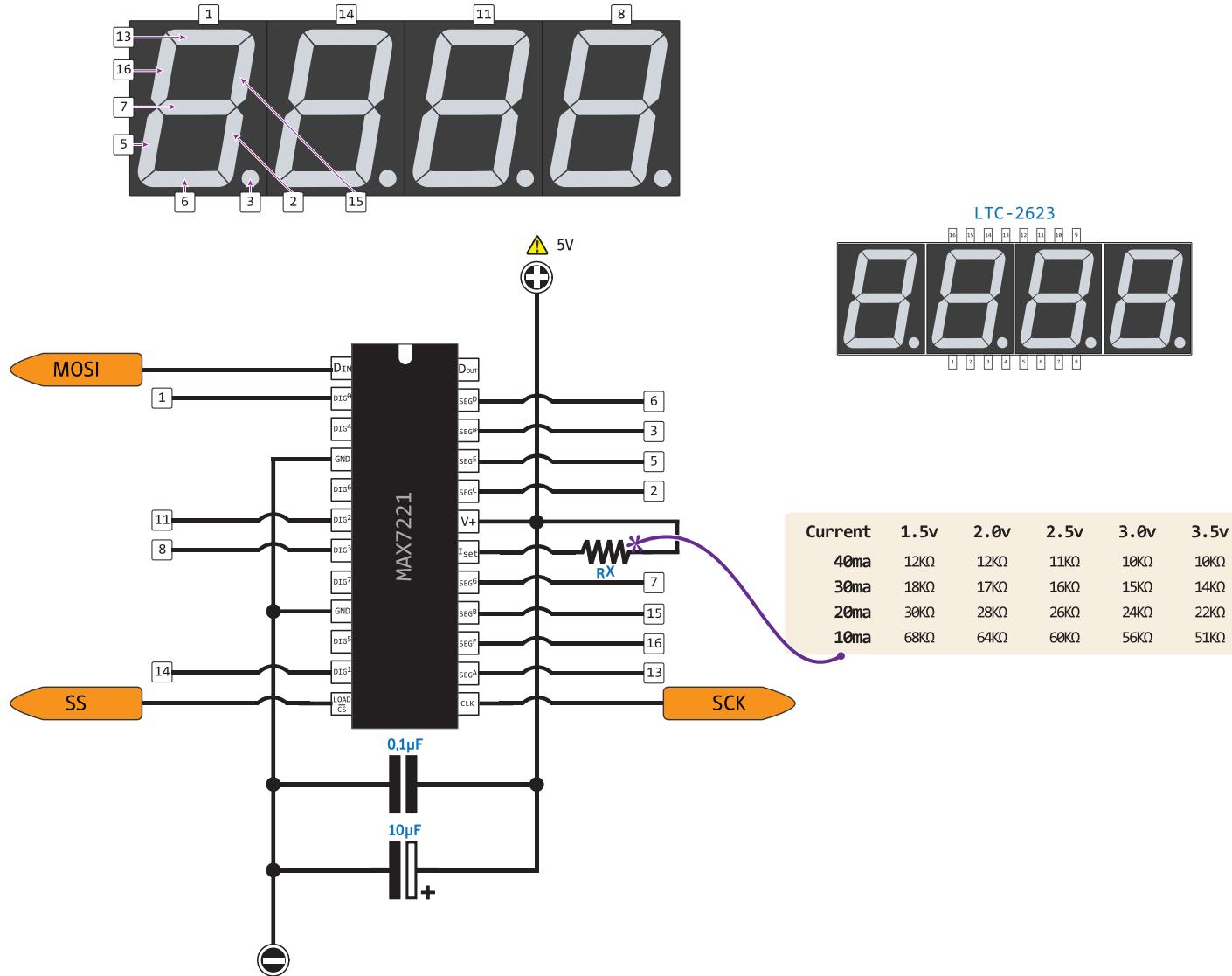
7 Segments Display (Common Anode) with Multiplexing



LED Array



7 Segments Display (Common Anode) with MAX7221



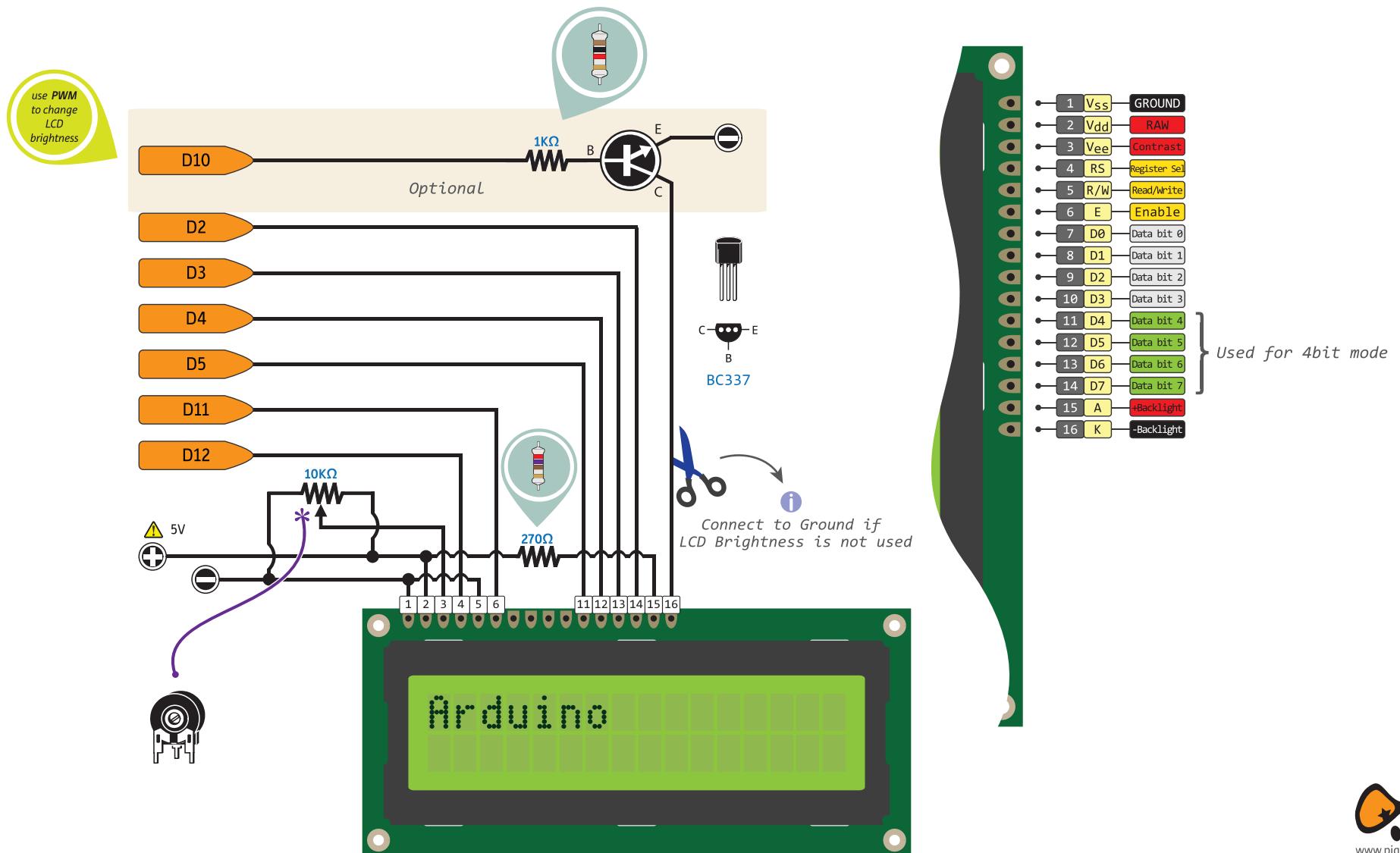
www.pighixxx.com



03 APR 2013

ver 1 rev 0

Connect a LCD HITACHI 44780 compatible



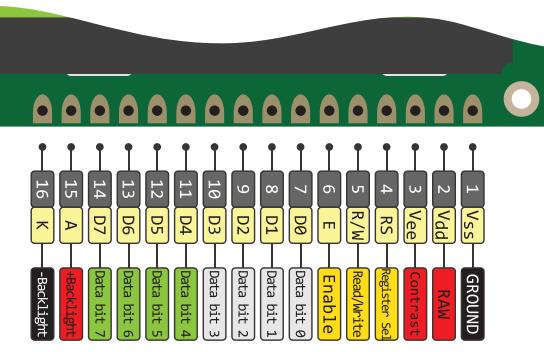
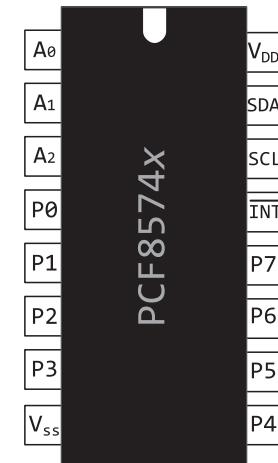
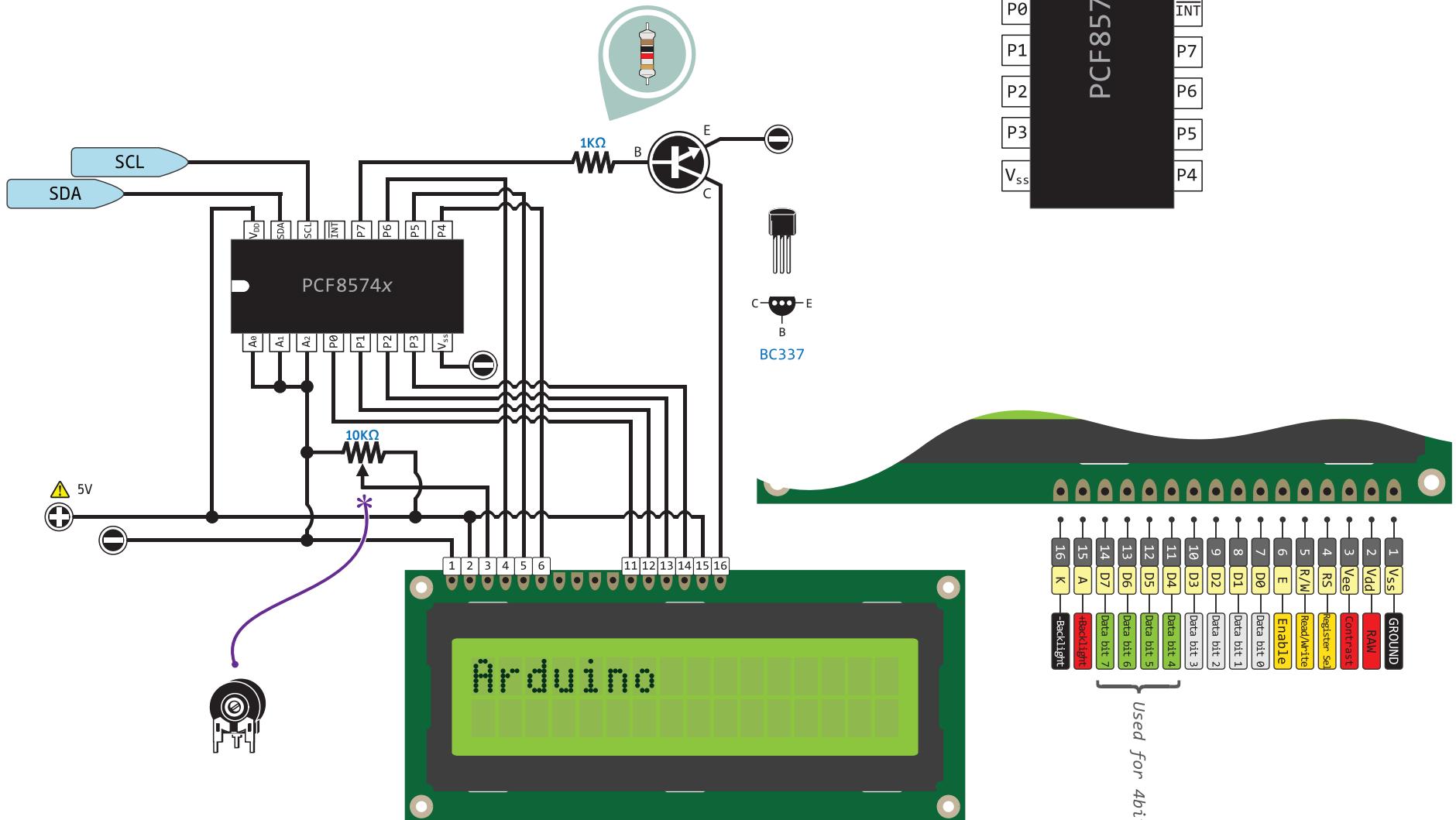
www.pighixxx.com



03 APR 2013

ver 1 rev 0

Connect via I2C a LCD HITACHI 44780 compatible



Used for 4bit mode



www.pighixxx.com

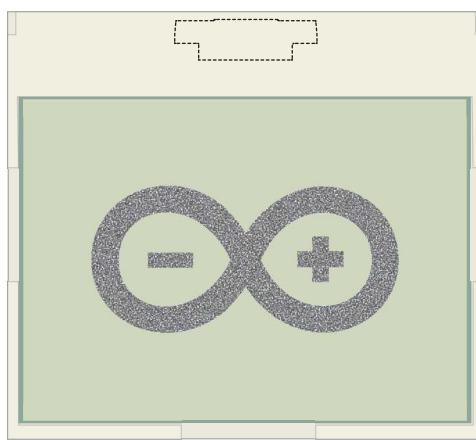


03 APR 2013

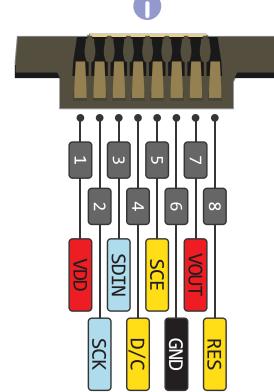
ver 1 rev 0

Connect a NOKIA LCD (Basic)

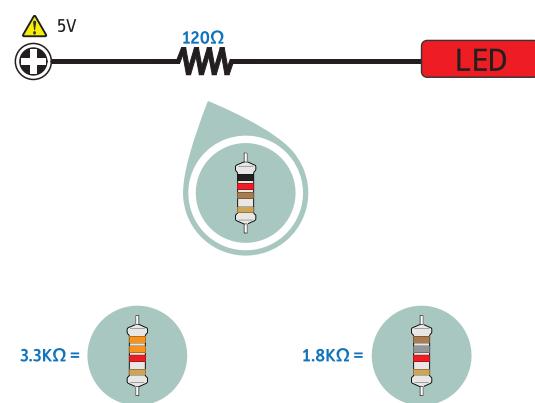
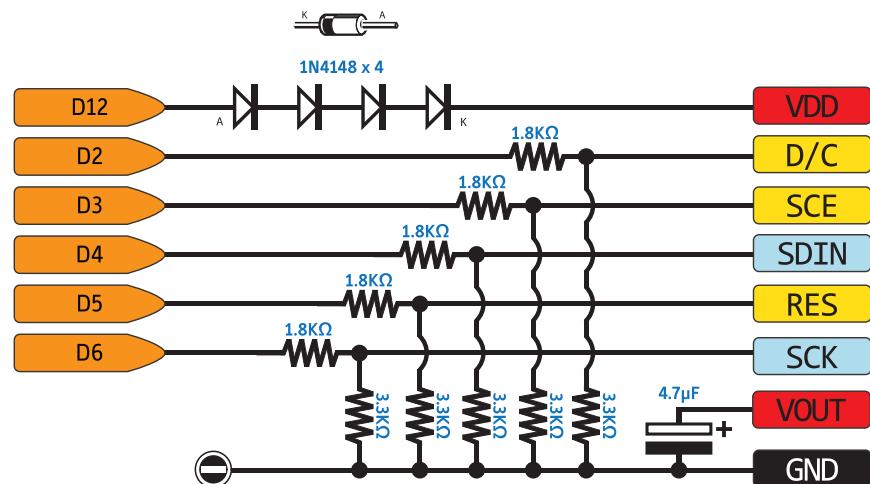
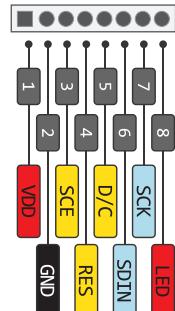
 Only for 5V Arduino



NOKIA 3110



NOKIA 5110



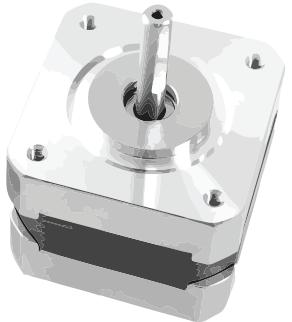
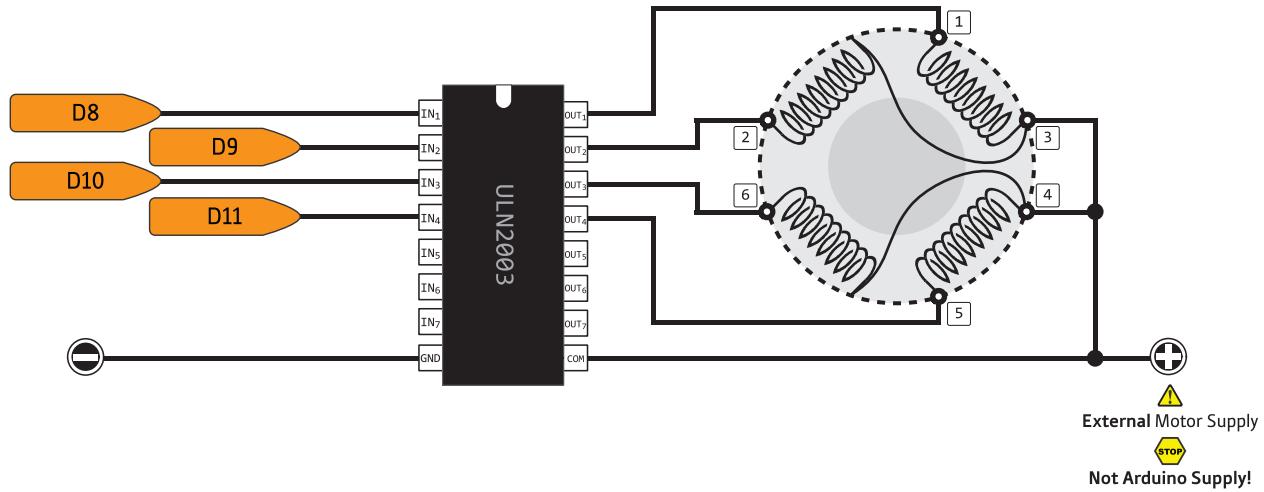
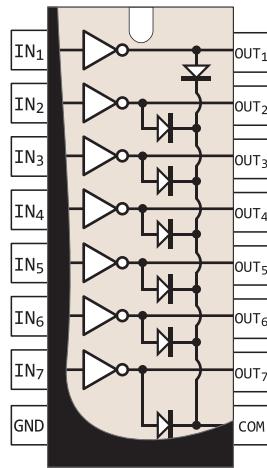
www.pighixxx.com



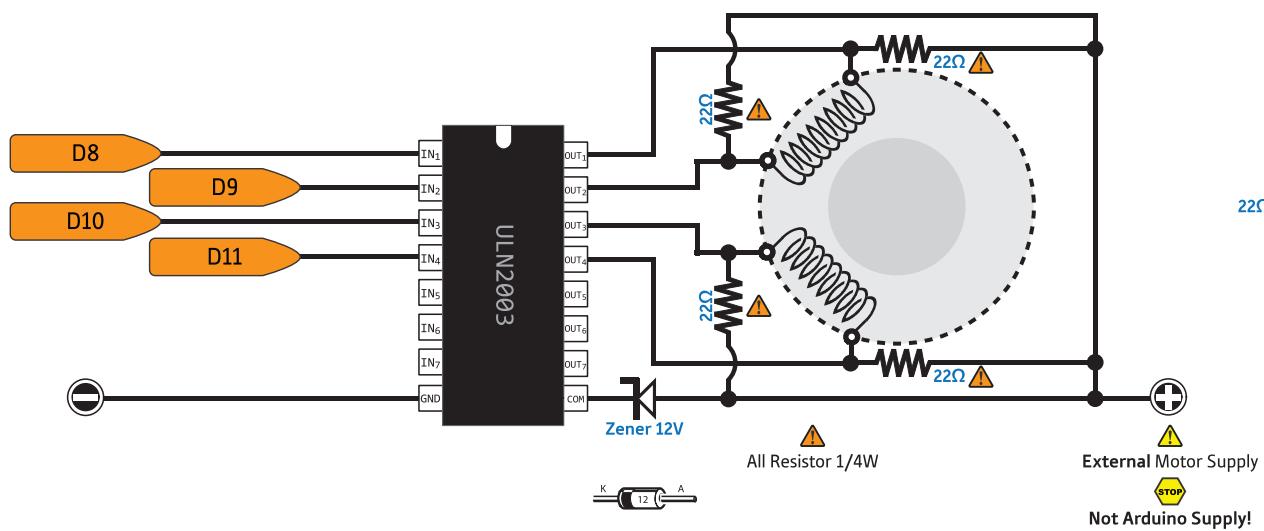
03 APR 2013

ver 1 rev 0

Drive a Unipolar Stepper (Basic 1)



Drive a Bipolar Stepper (Basic 1)



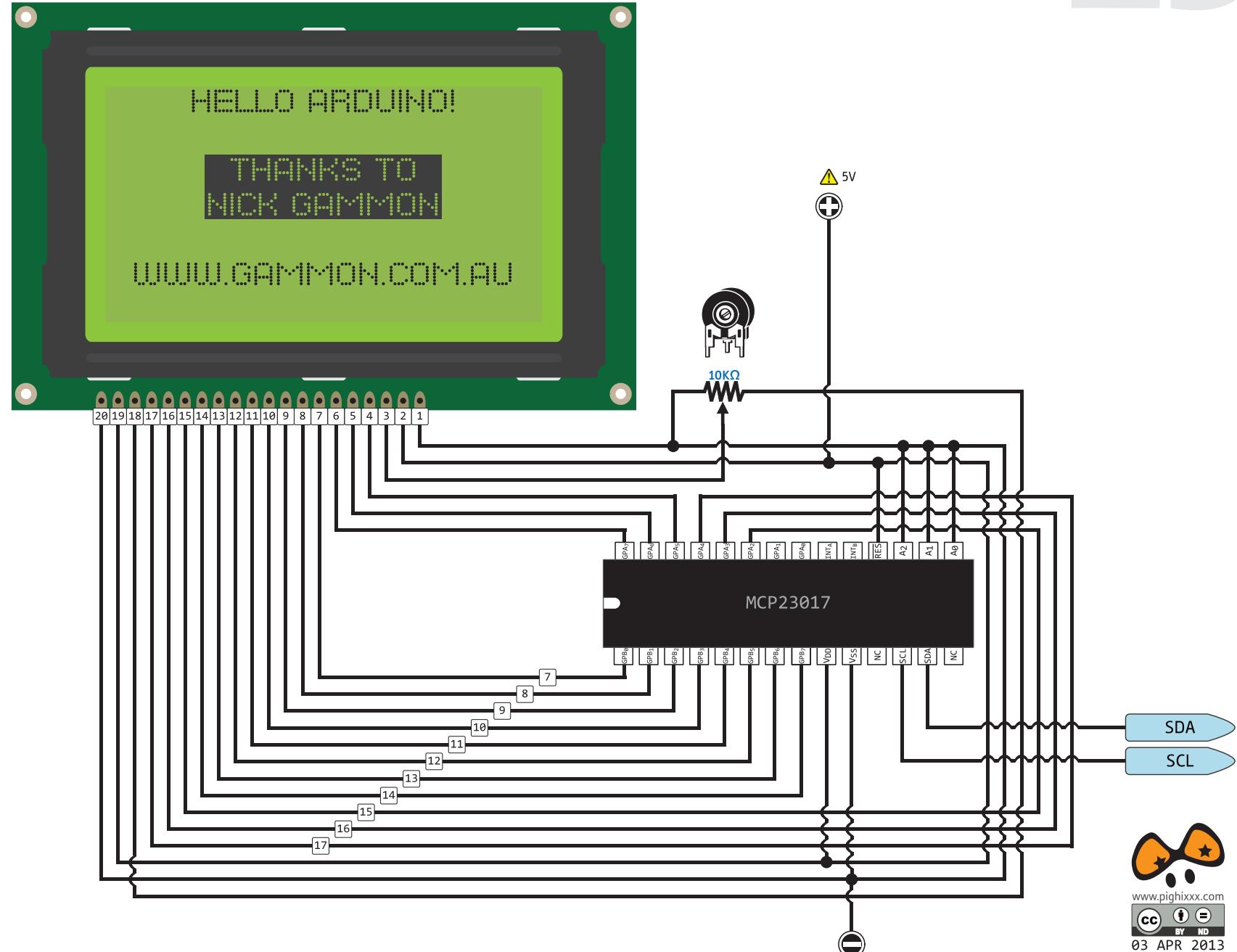
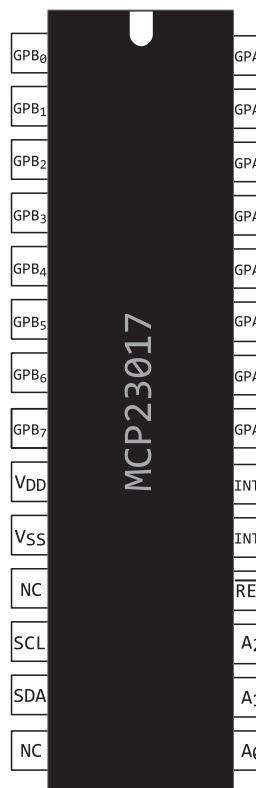
www.pighixxx.com



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Connect a graphical LCD via I₂C



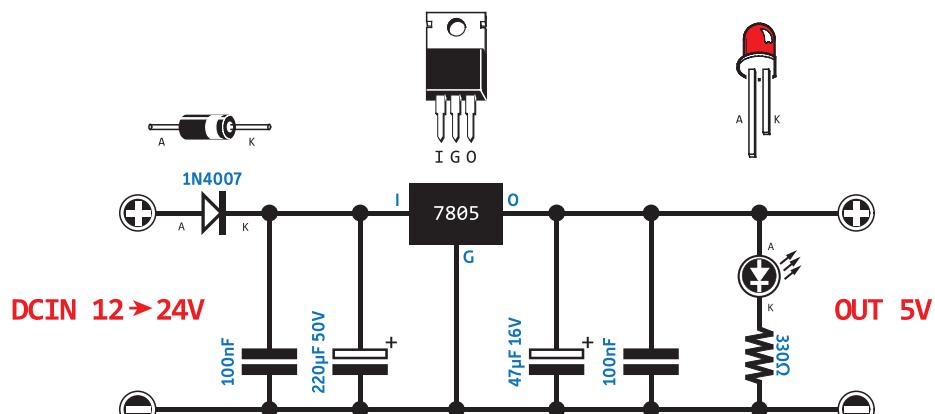
www.pighixxx.com



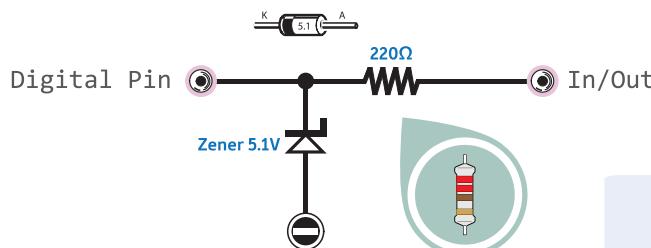
03 APR 2013

ver 1 rev 0

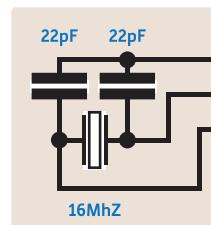
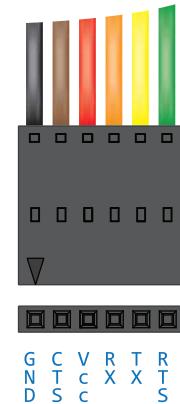
Simple 5V Power Supply



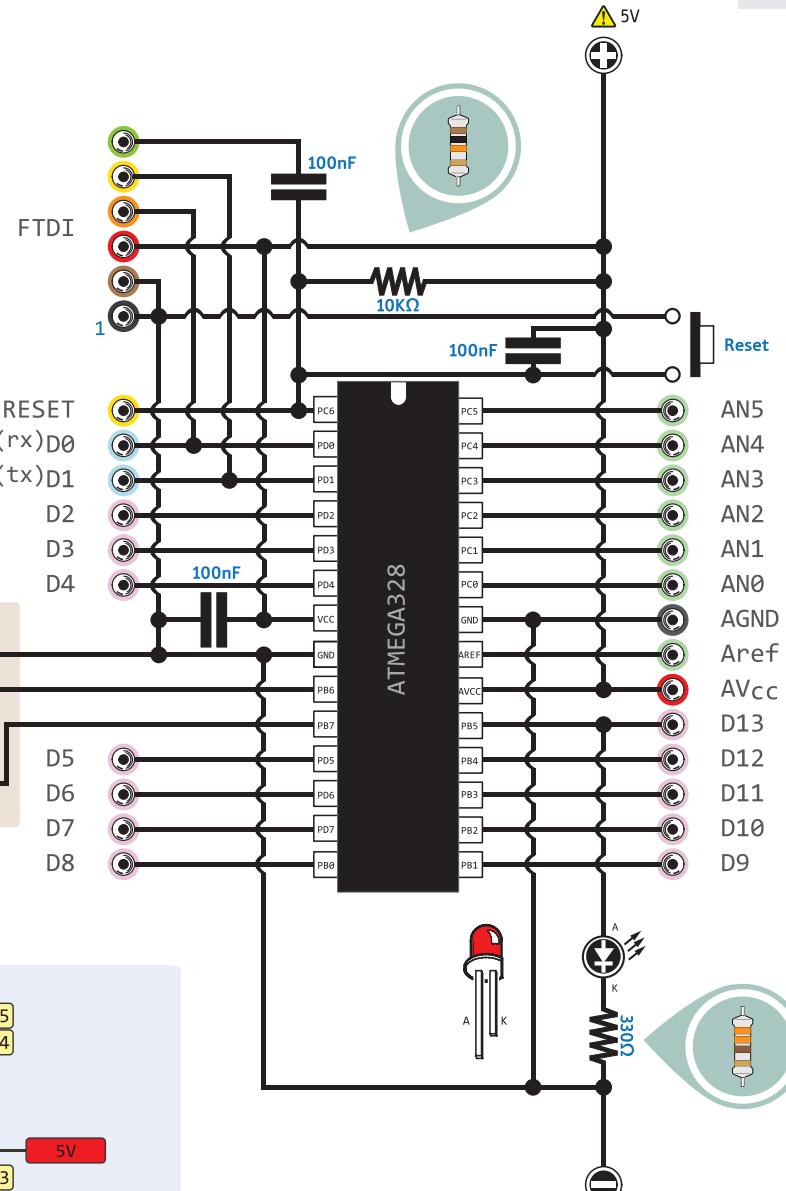
Protect a I/O Pin



FTDI Connector



DIY Arduino



Recommended ICSP pinout



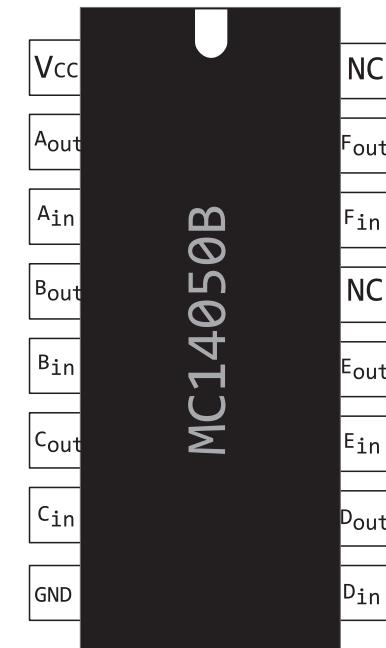
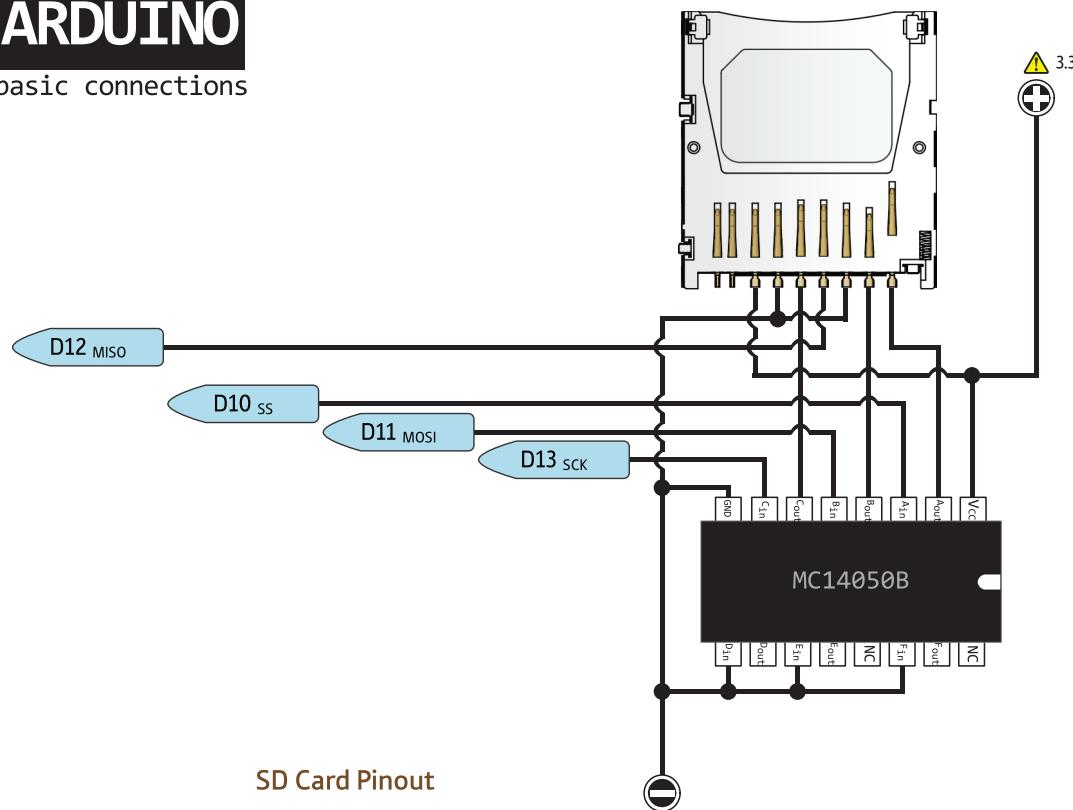
www.pighixxx.com



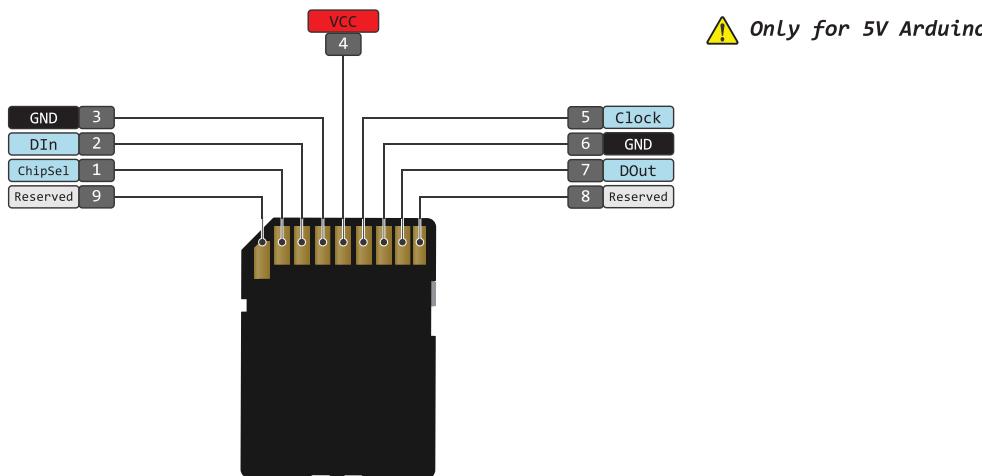
03 APR 2013

ver 1 rev 2

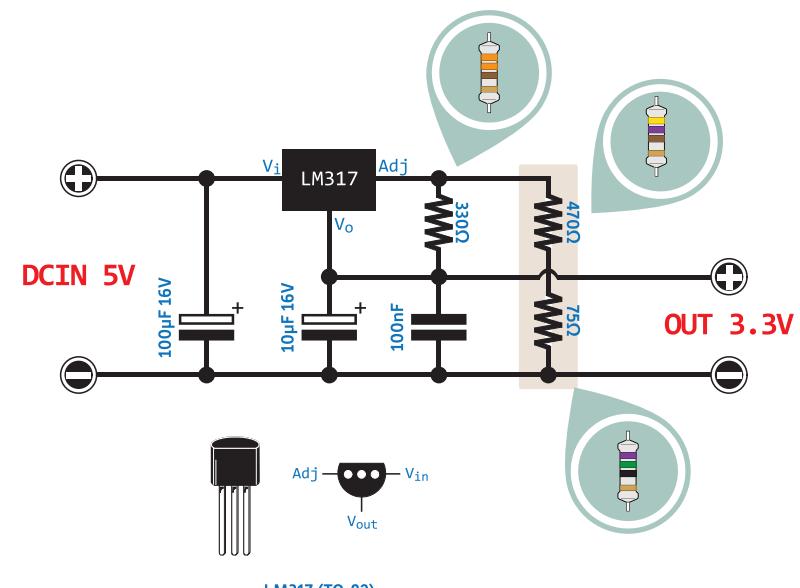
Connect a SD Card



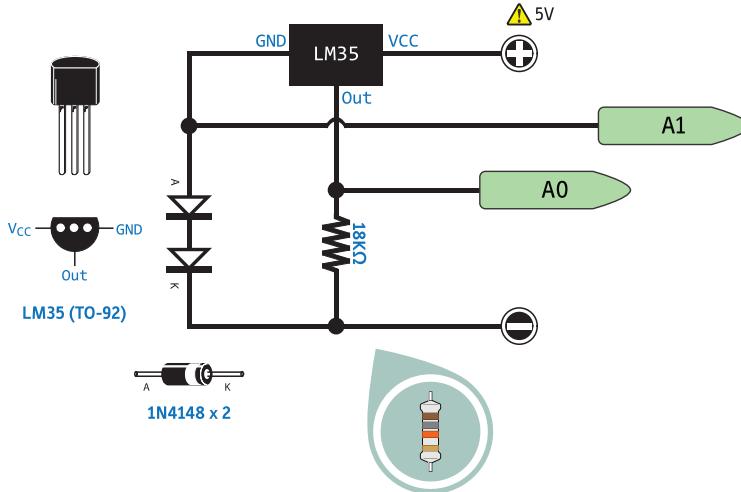
SD Card Pinout



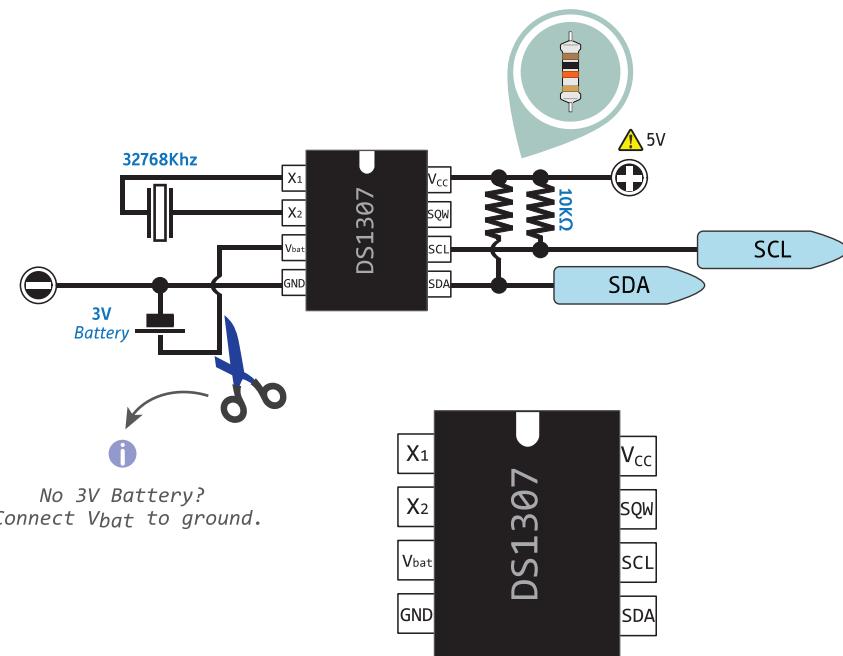
Simple 3.3V Power Supply



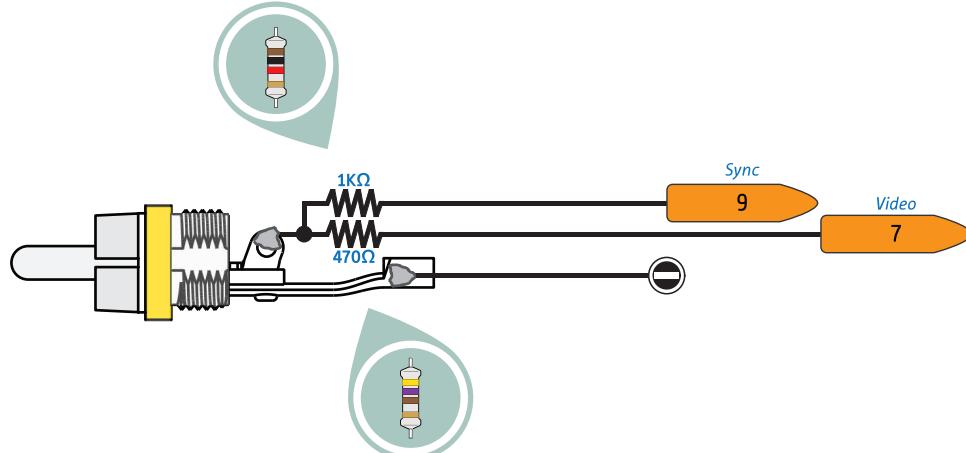
Connect a Temperature Sensor (LM35)



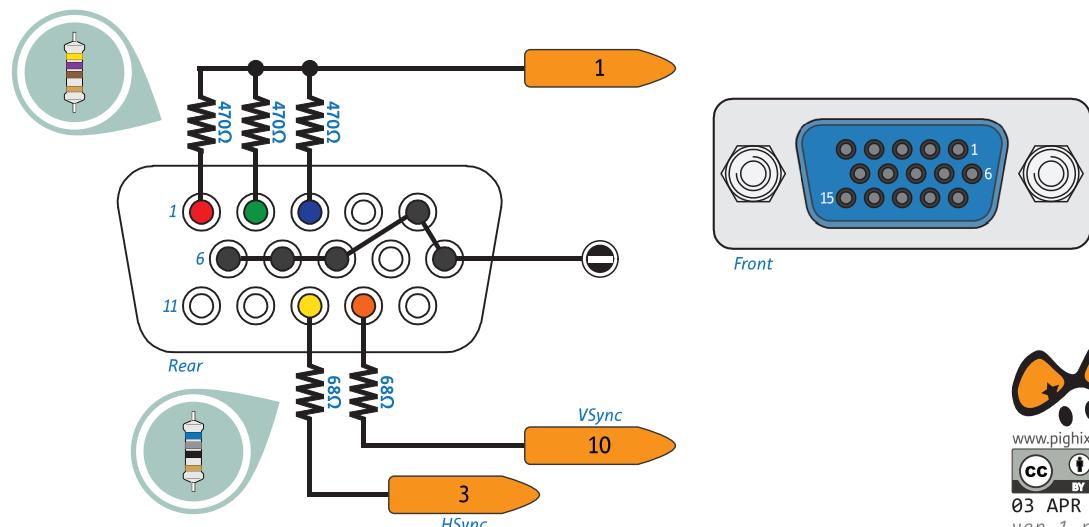
Connect a RTC (DS1307)



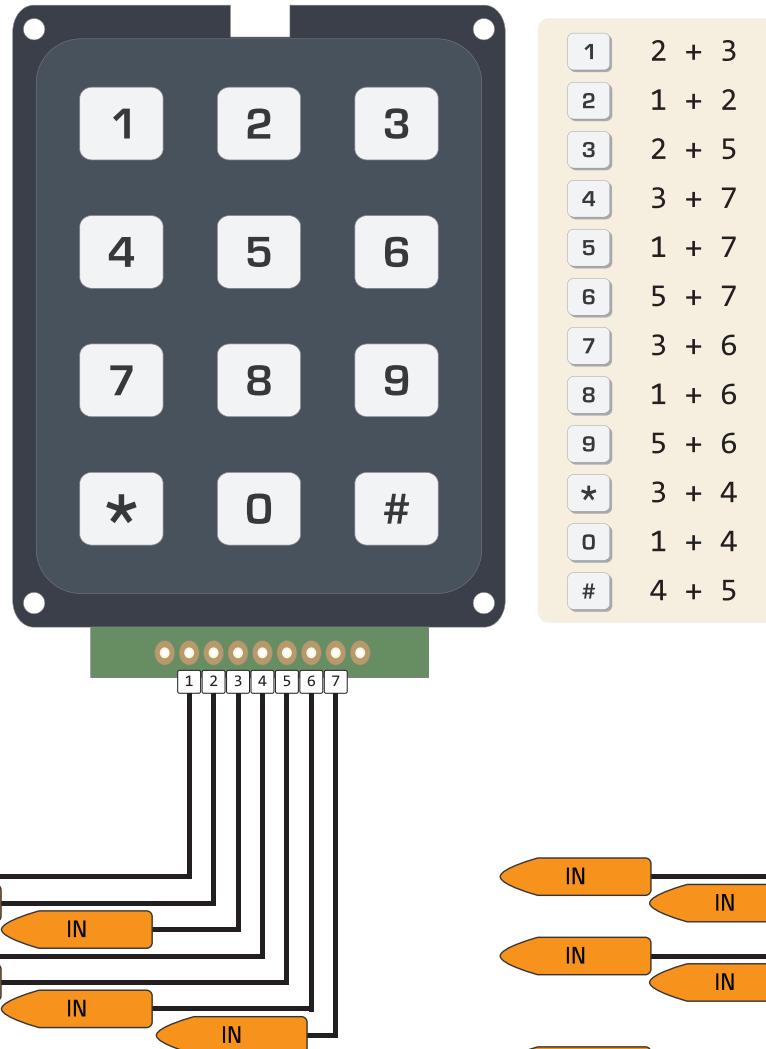
Connect to Composite Video



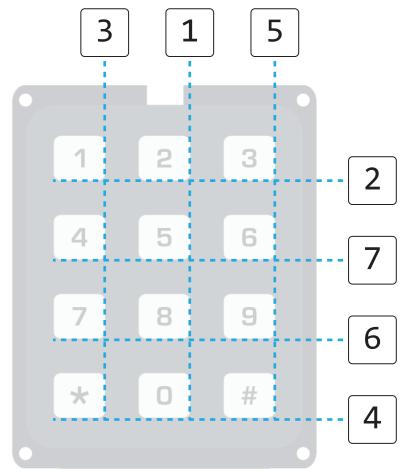
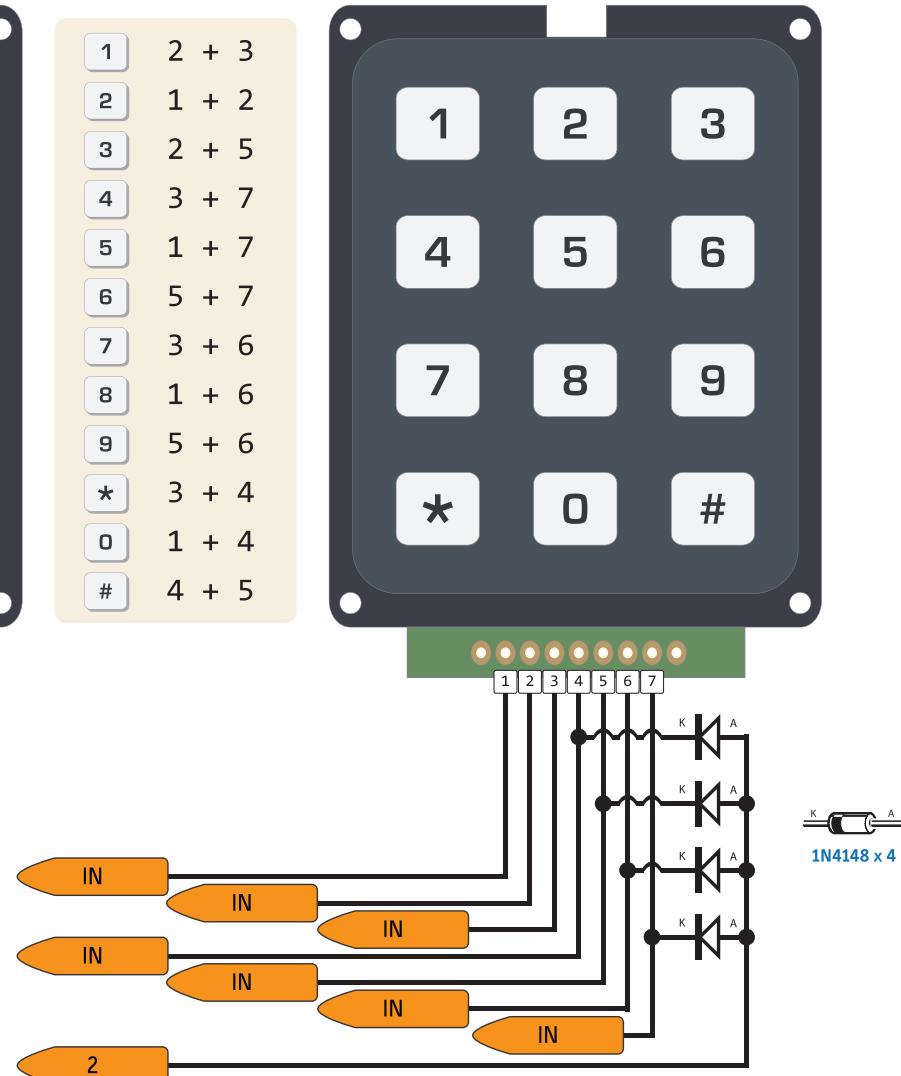
Connect to VGA



Connect a Keypad



Connect a Keypad (with Interrupt)



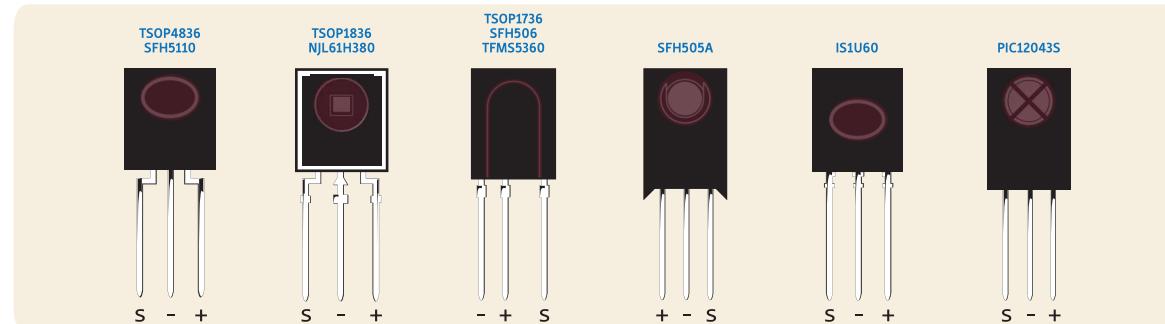
www.pighixxx.com



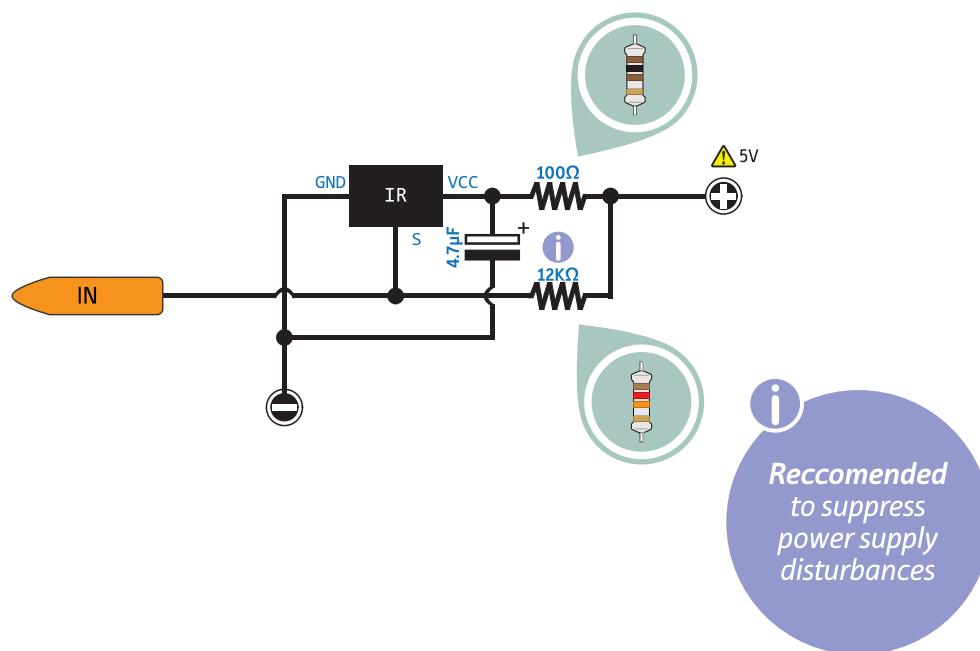
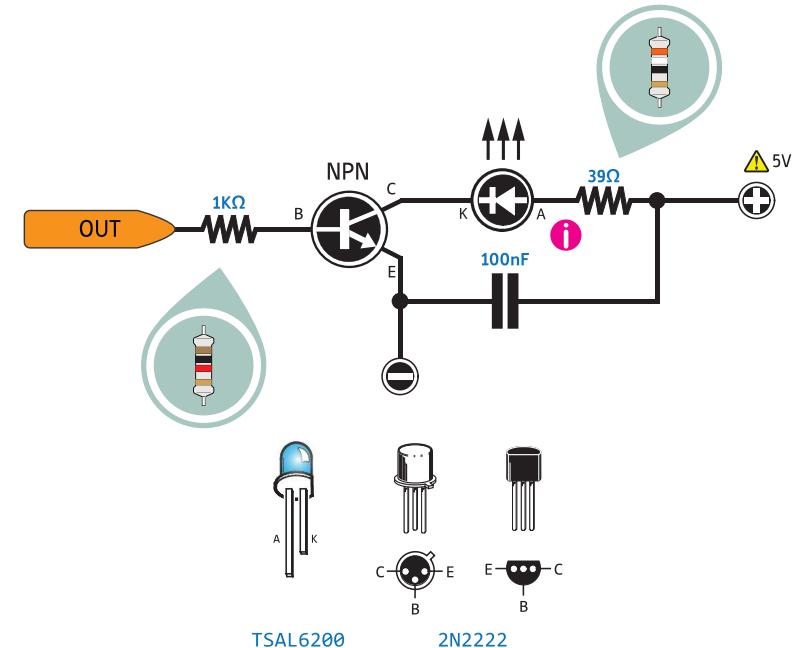
03 APR 2013

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Connect a IR Sensor



Connect a IR Emitter

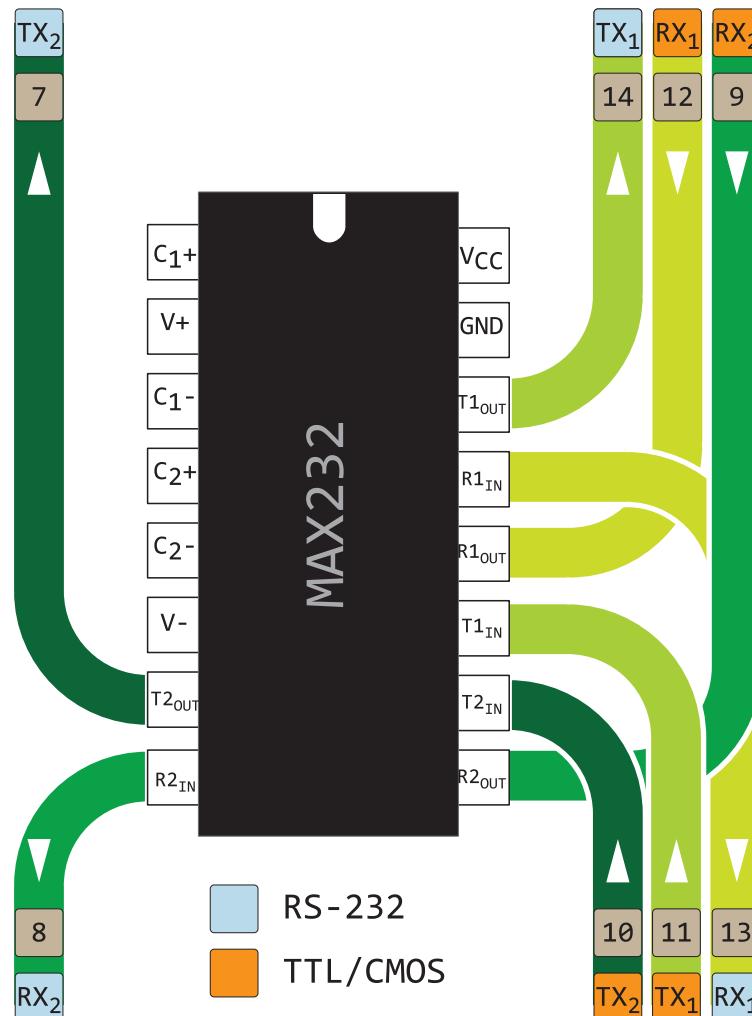


i

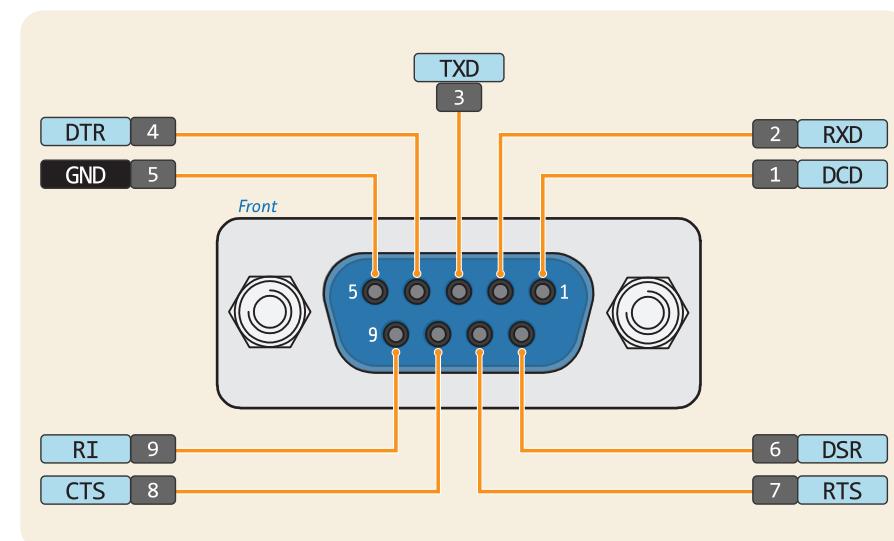
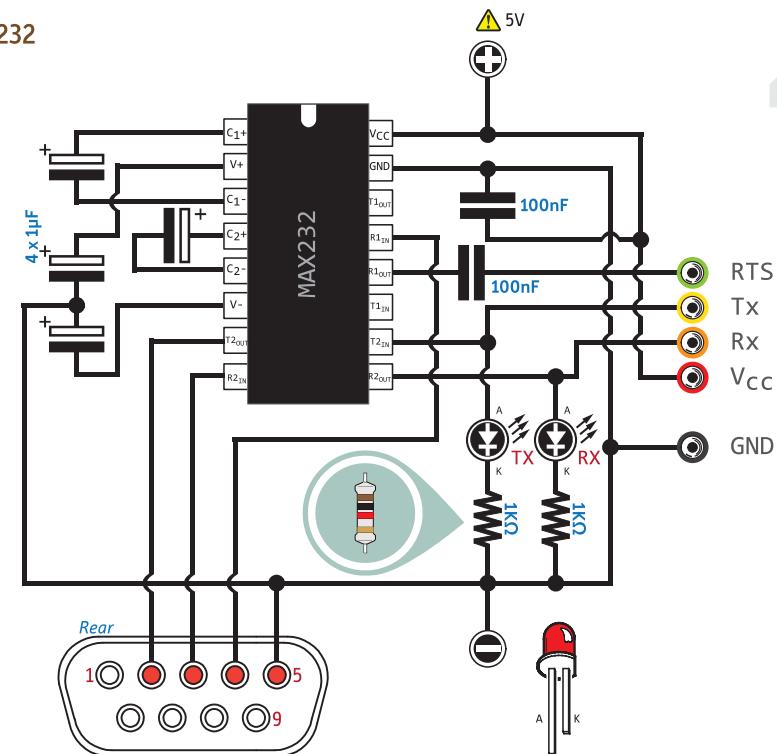
$$R = \frac{V_{in} - V_F}{I_F} * 1000$$

V_{in} Source Voltage
 V_F Forward Voltage Led
 I_F Forward Current Led





Connect a MAX232



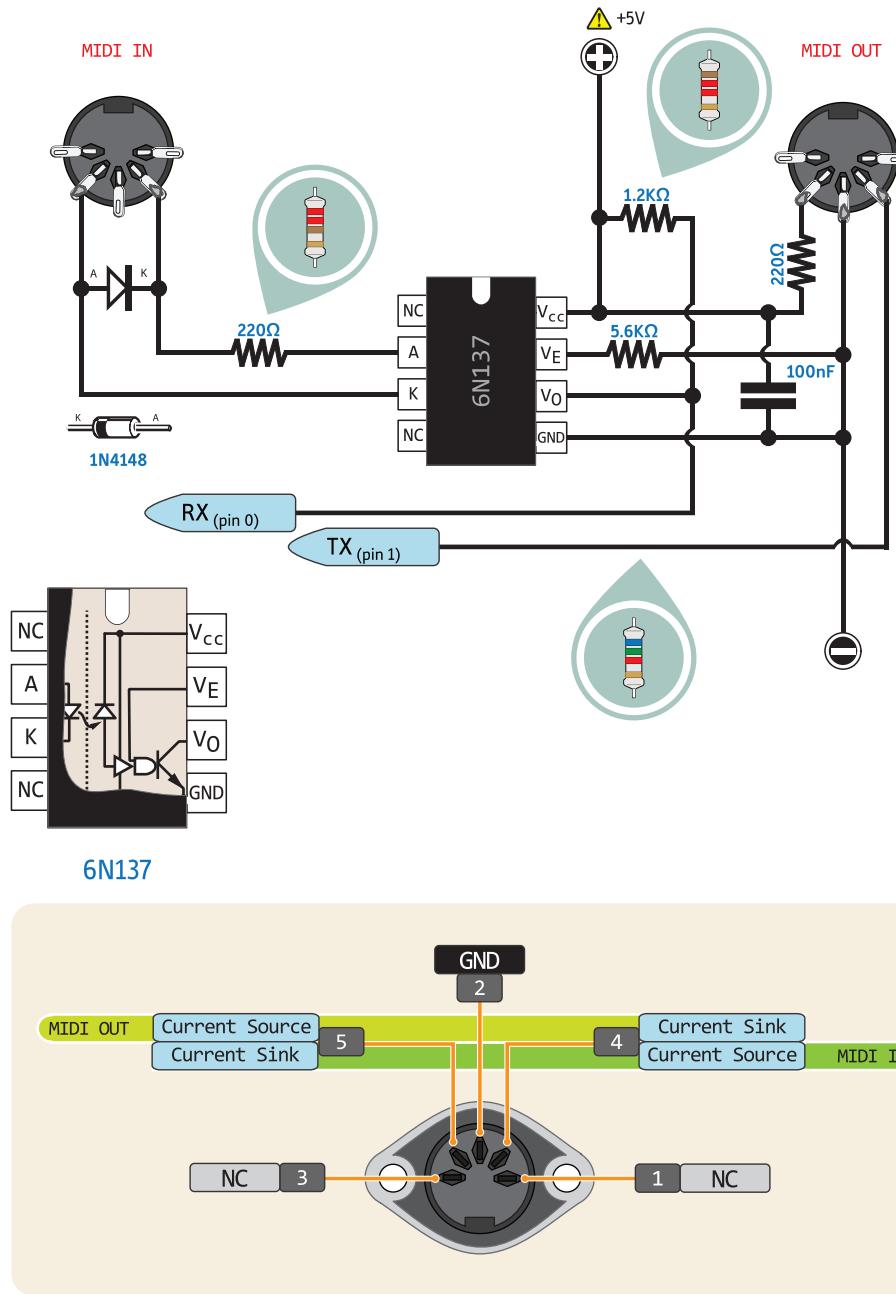
www.pighixxx.com



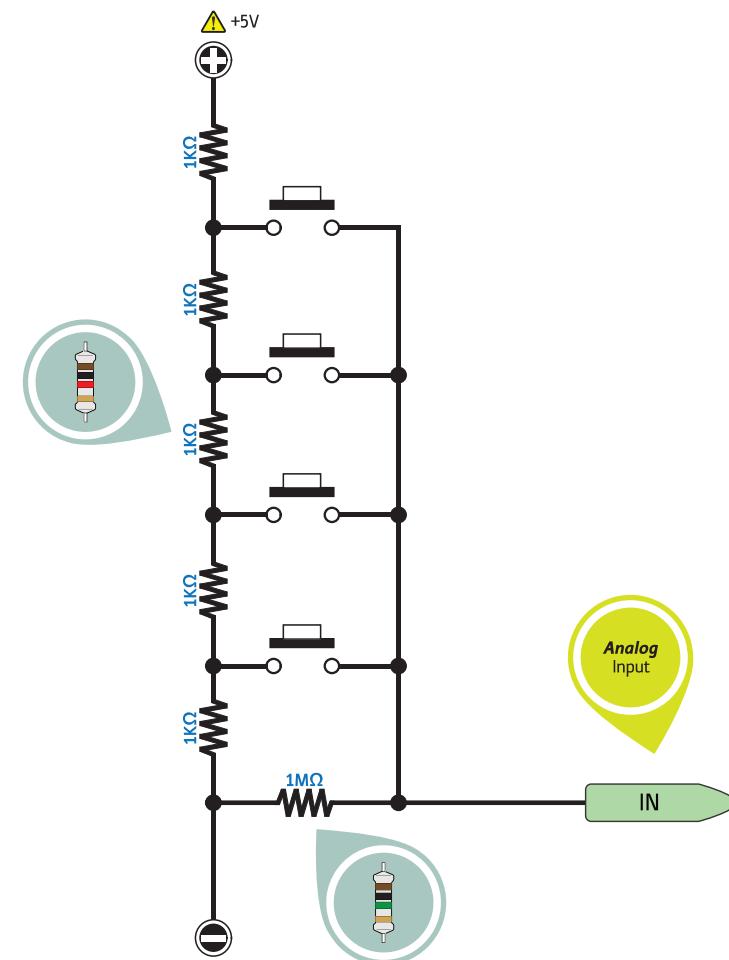
05 APR 2013

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MIDI Interface



Multiple Buttons using 1 Analog Input



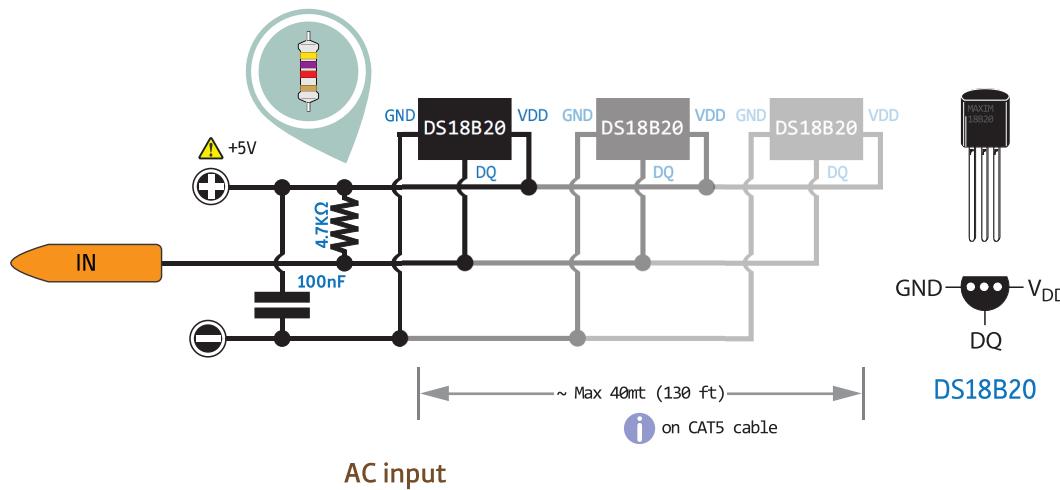
www.pighixxx.com



06 APR 2013

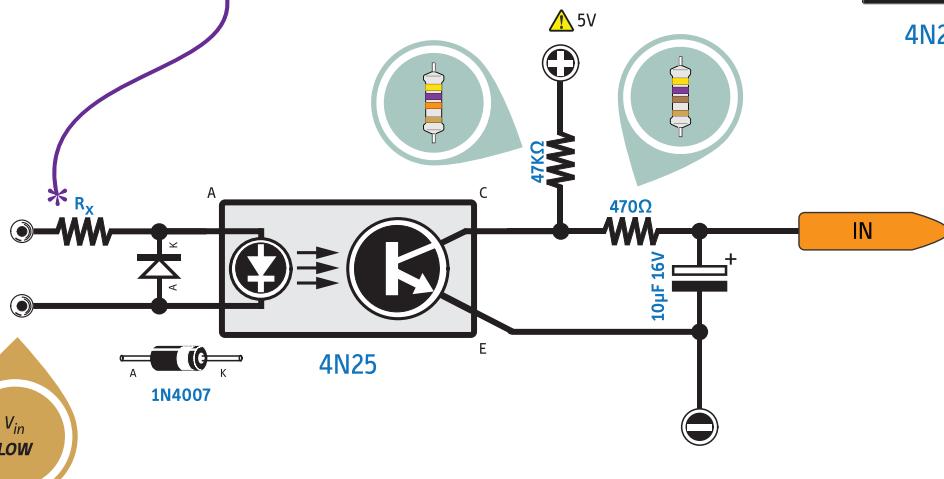
ver 1 rev 0

Connect a Digital Temperature Sensor (DS18B20)

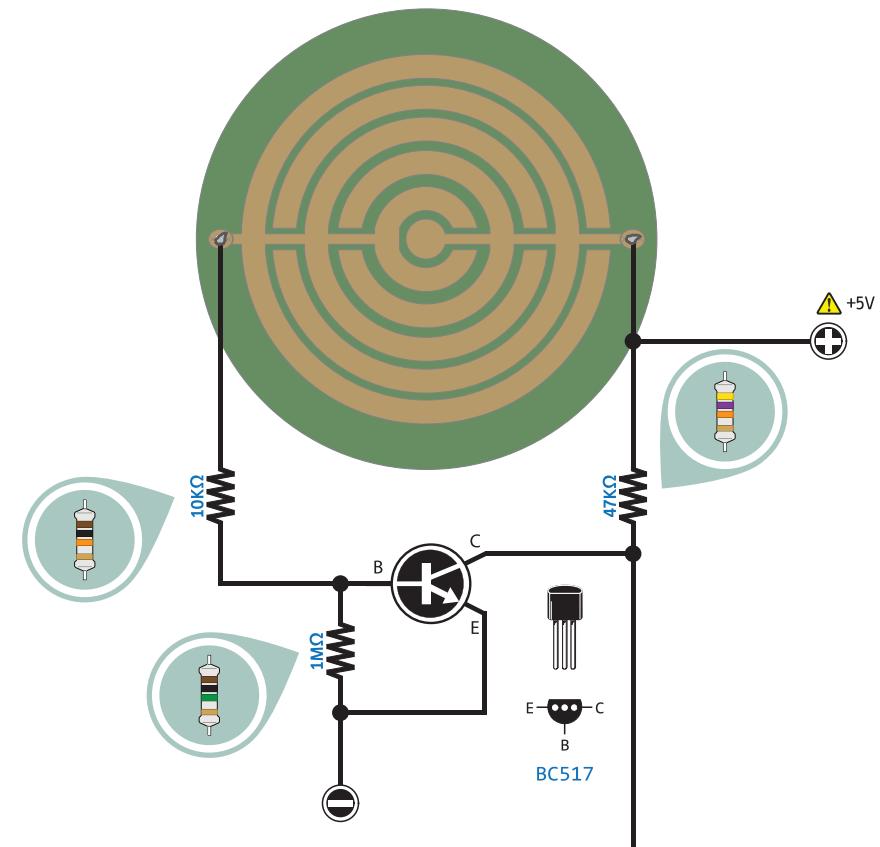


AC input

Volt _{in}	Resistor Value
12	470Ω
24	1KΩ
48	2.2KΩ



A simple Rain Sensor with Arduino



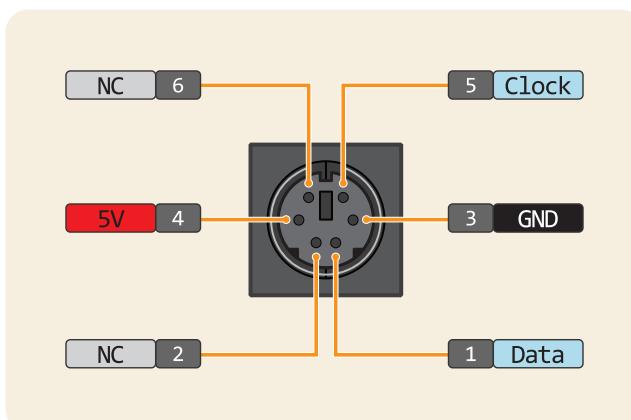
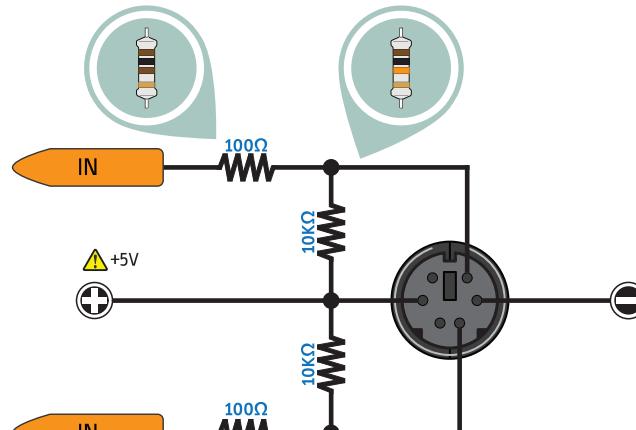
www.pighixxx.com



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Connect a PS2 Keyboard



Scan Codes

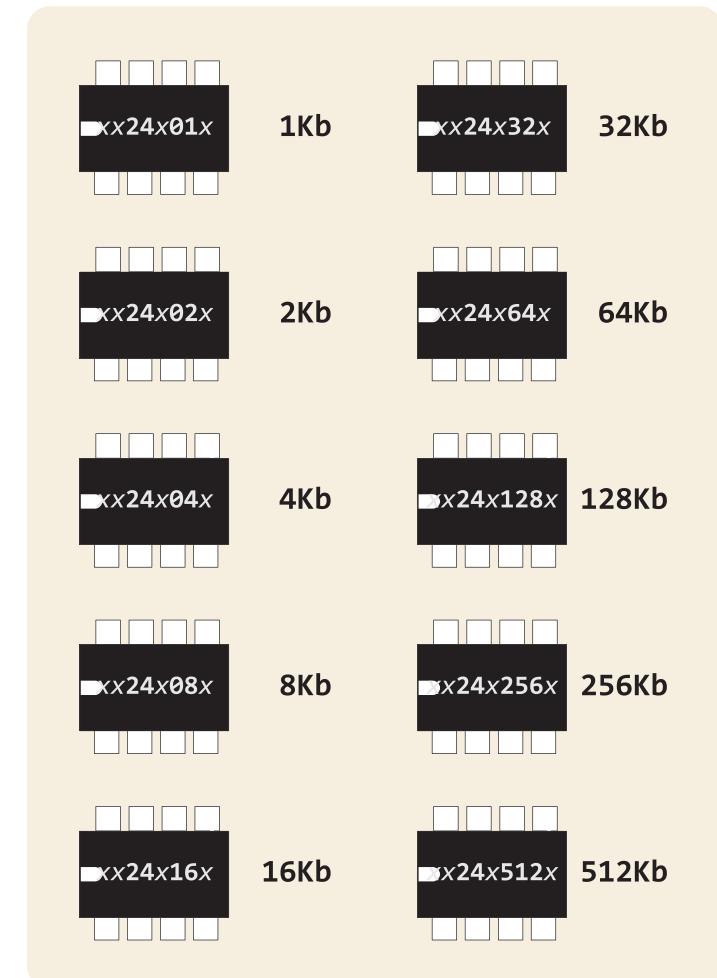
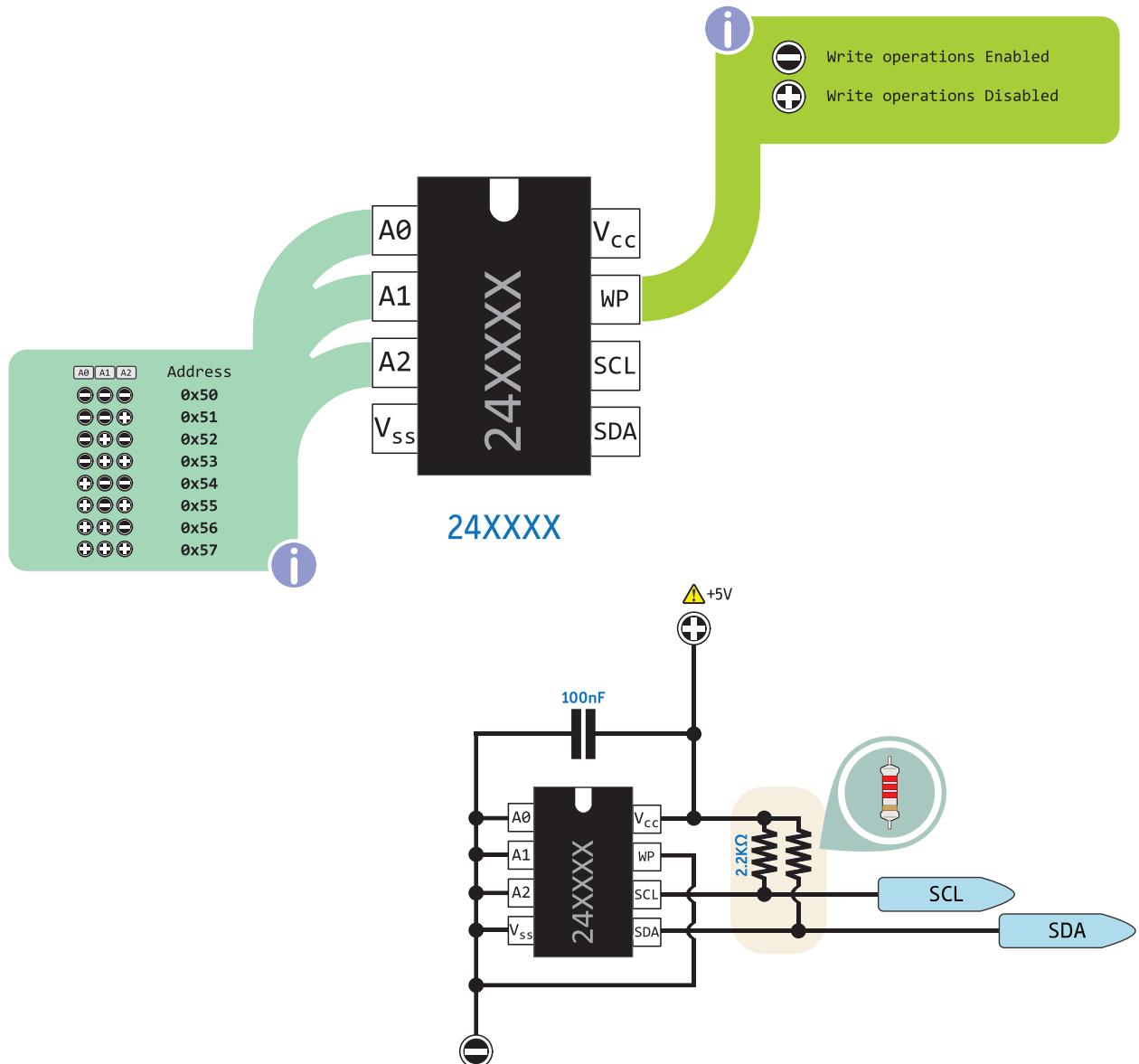


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Connect a EEPROM via I²C

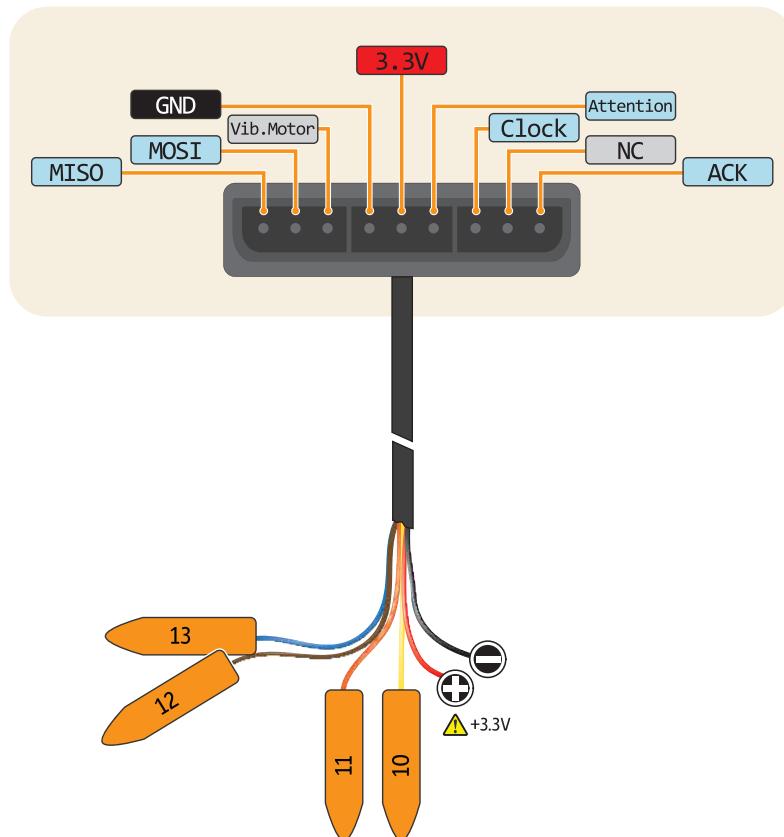
www.pighixxx.com



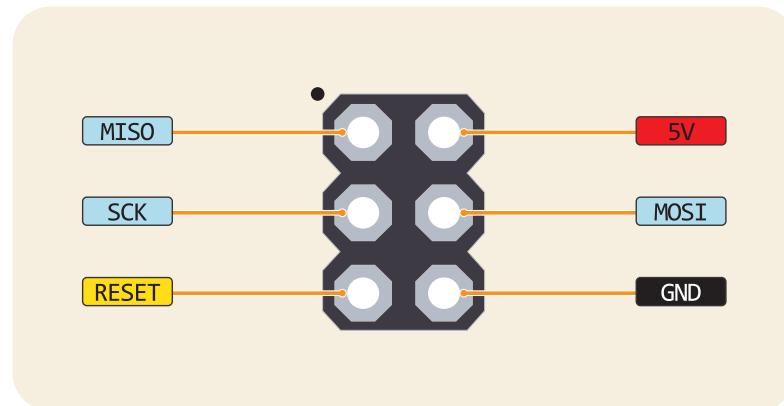
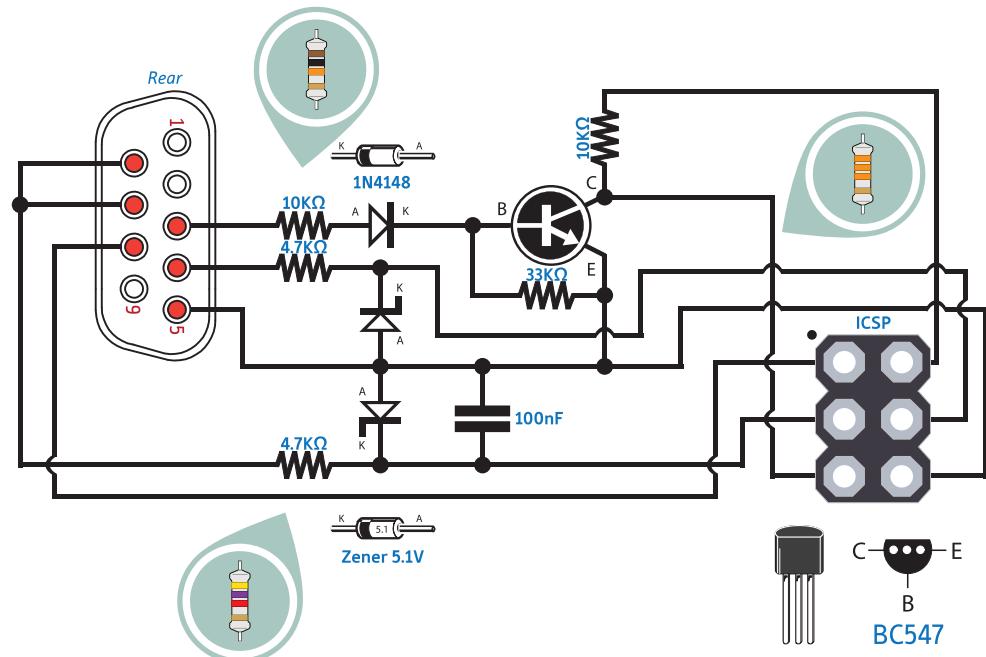
07 APR 2013

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Connect a PS2 Dualshock® controller



A Simple programmer



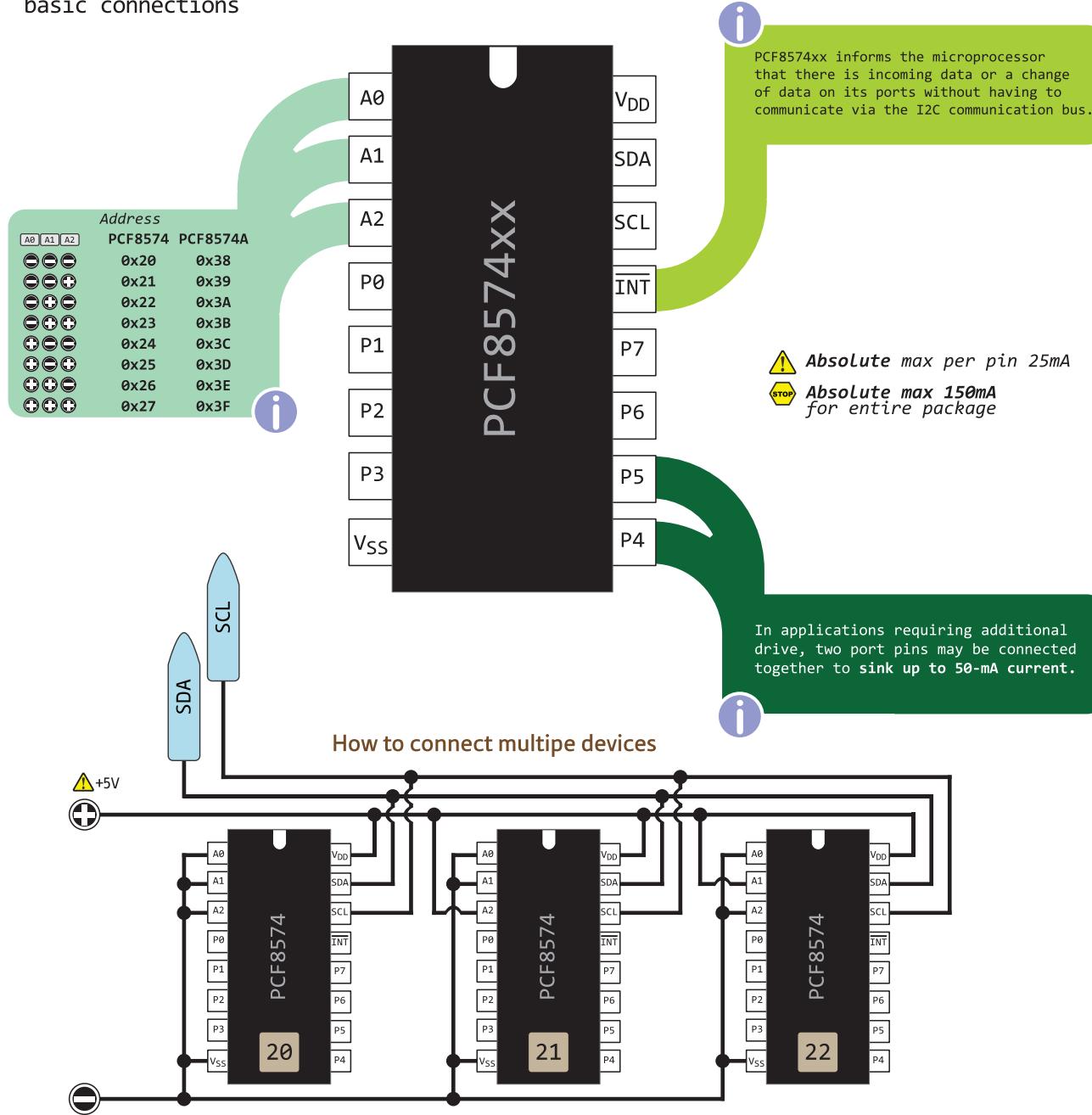
www.pighixxx.com



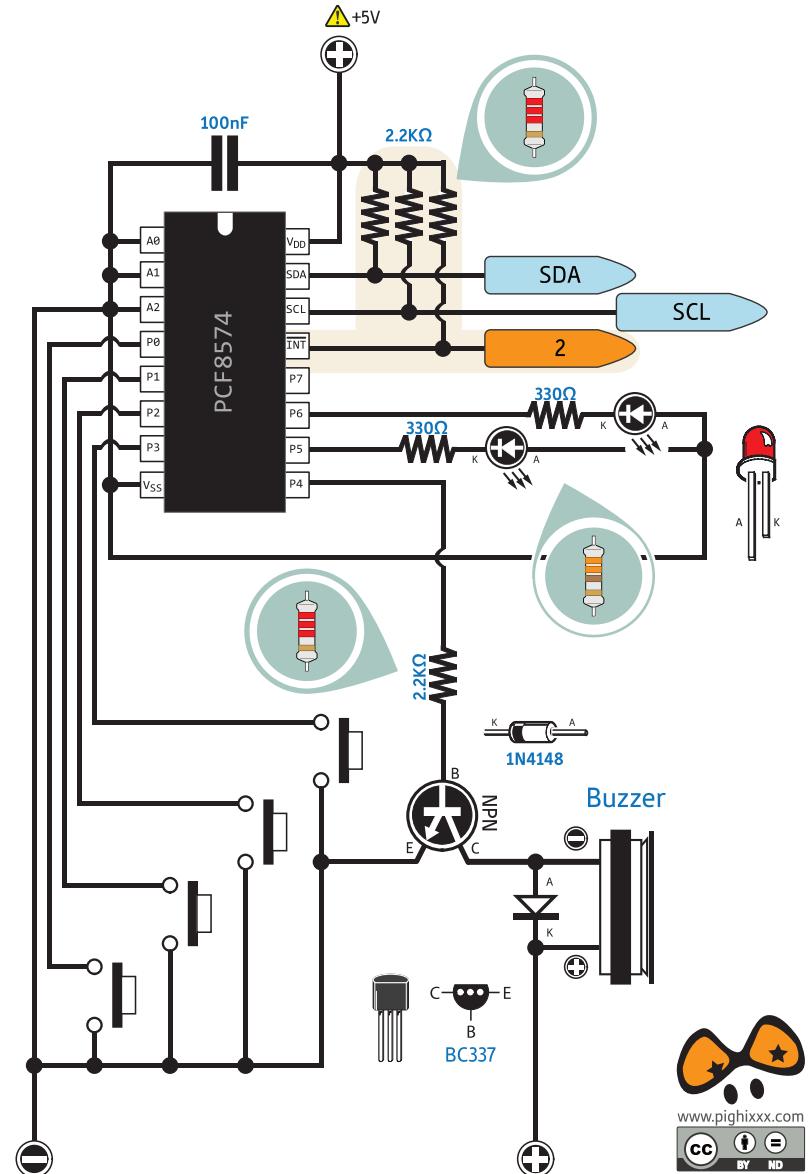
08 APR 2013

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Port Expander (PCF8574xx)



A typical Application



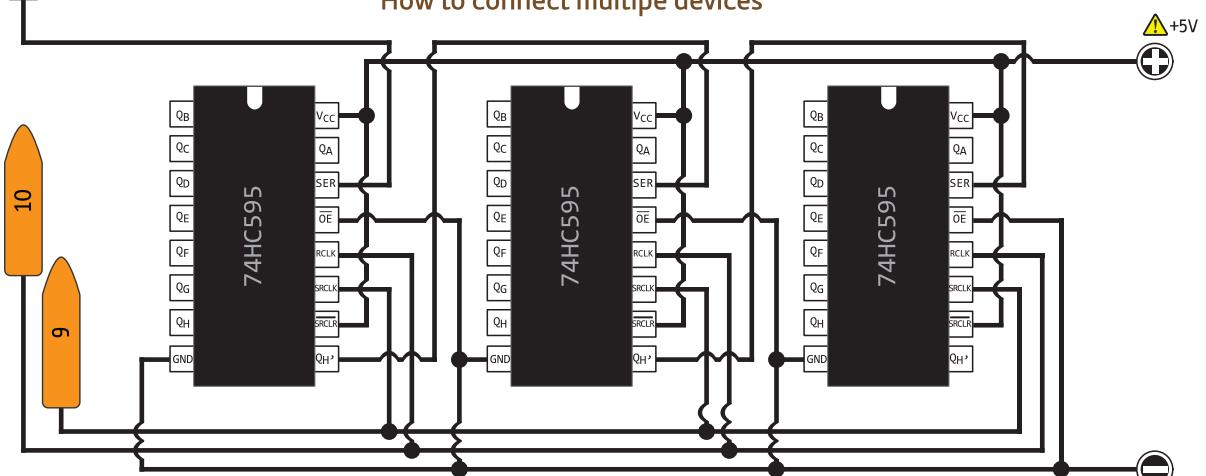
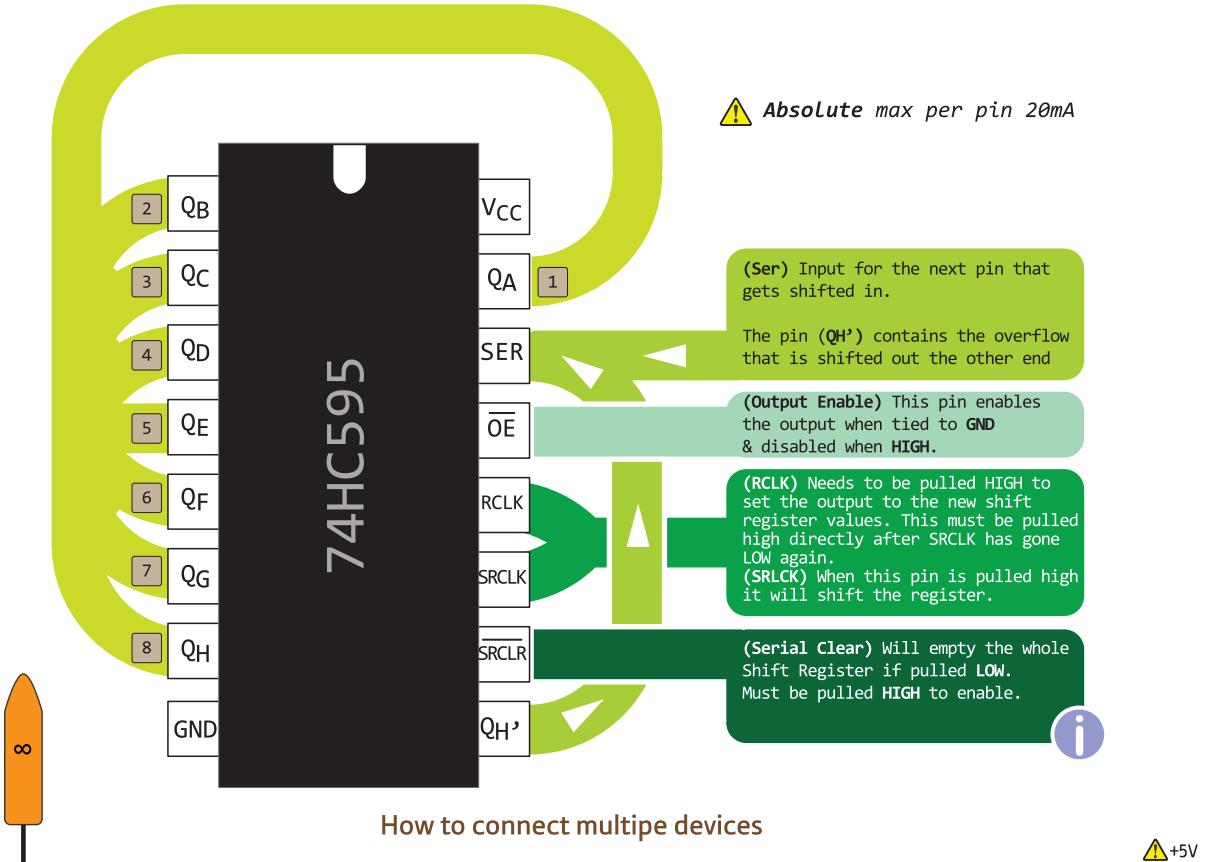
www.pighixx.com



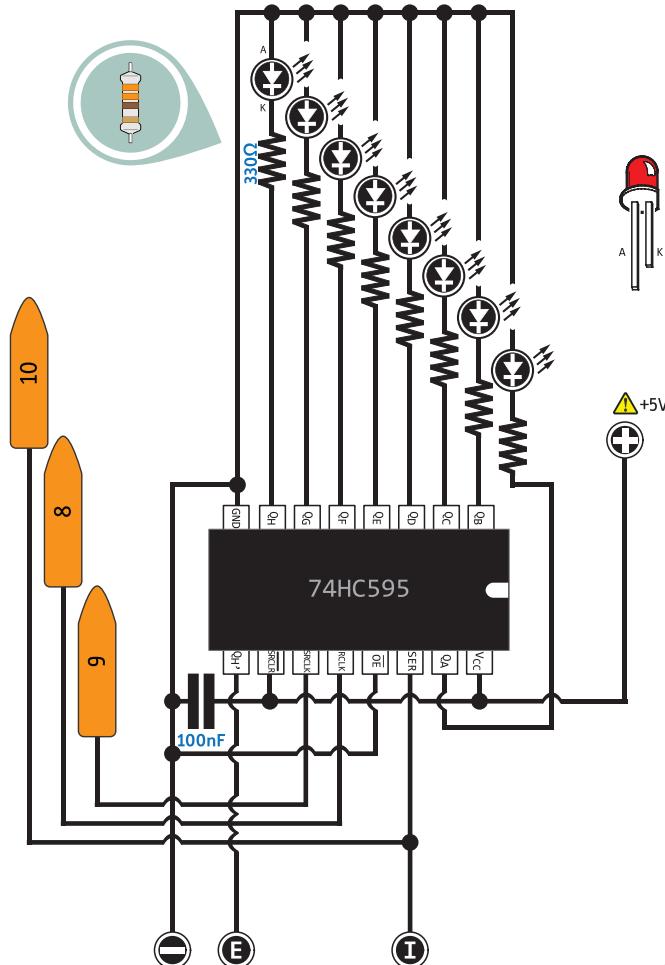
10 APR 2013

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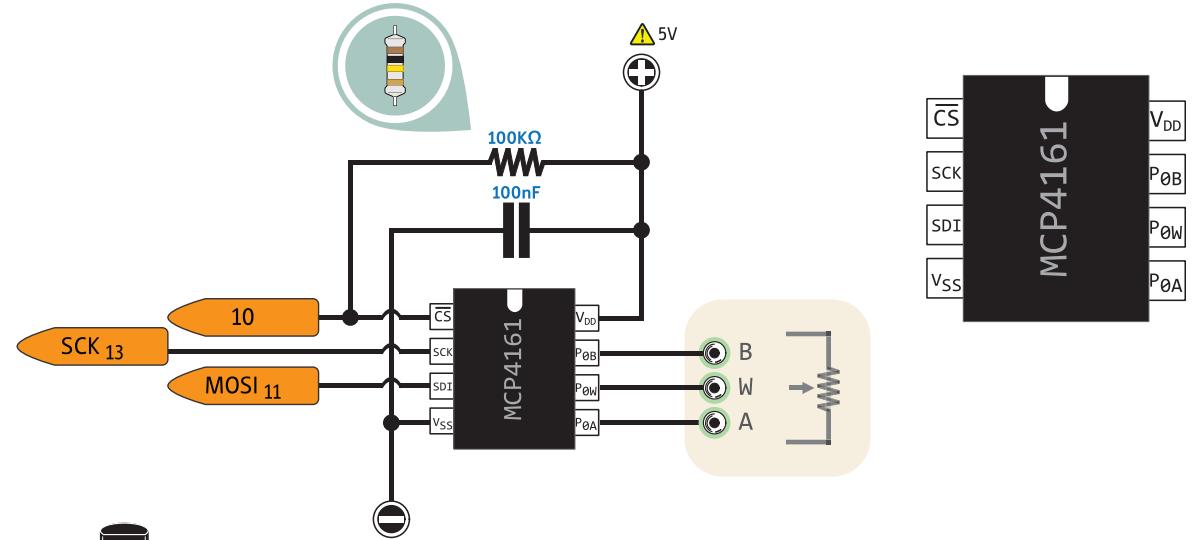
Shift Register (74HC595)



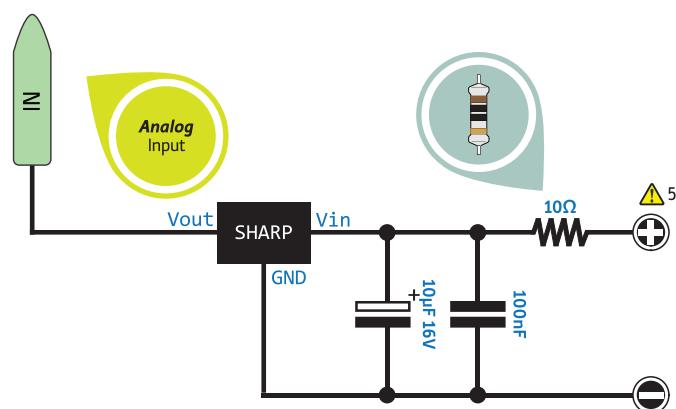
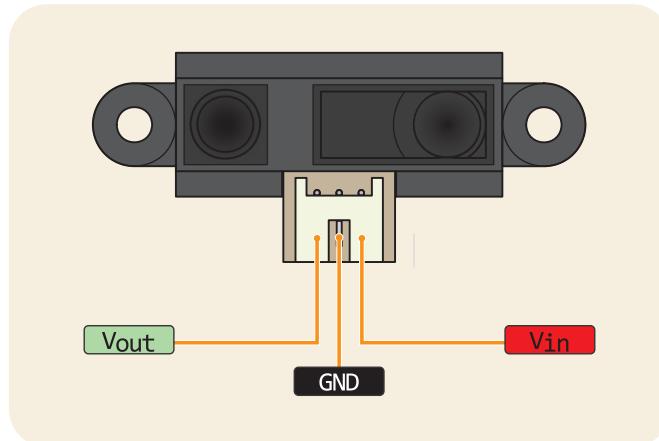
A typical Application



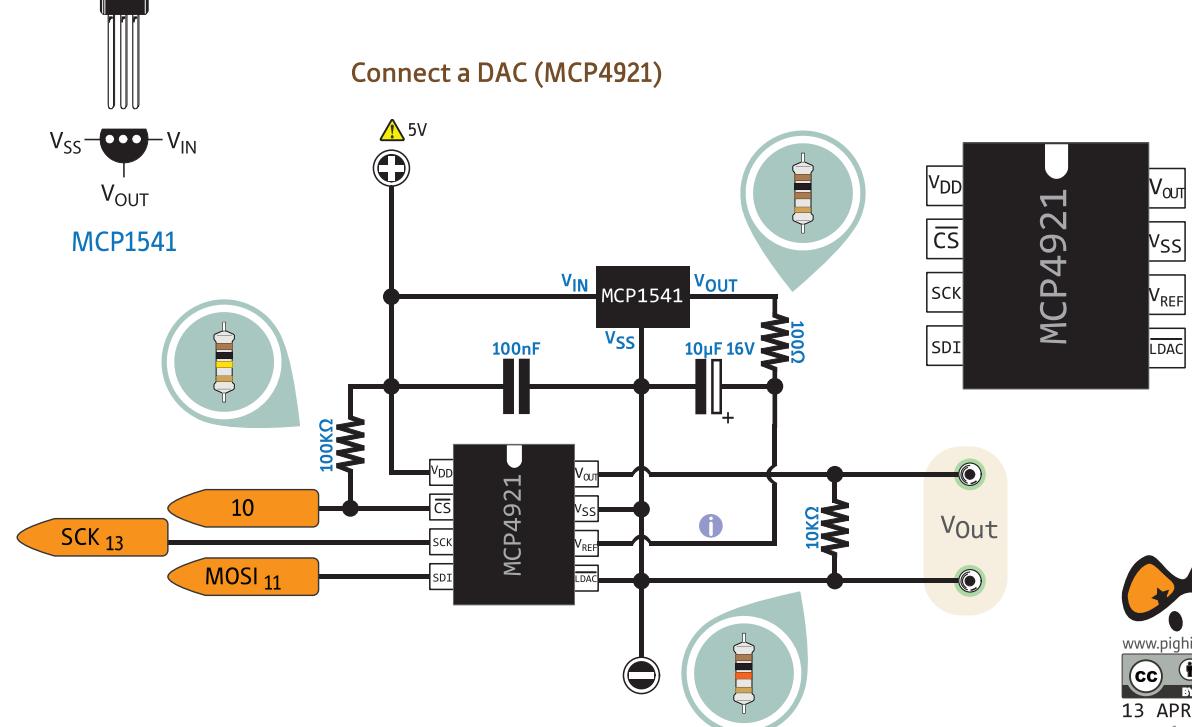
Connect a Digital Potentiometer (MCP4161)



Connect a Distance Sensor (Sharp GP2Y0A21)



Connect a DAC (MCP4921)



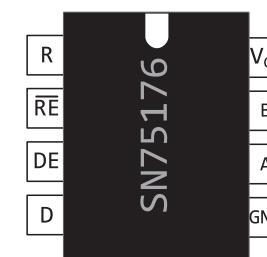
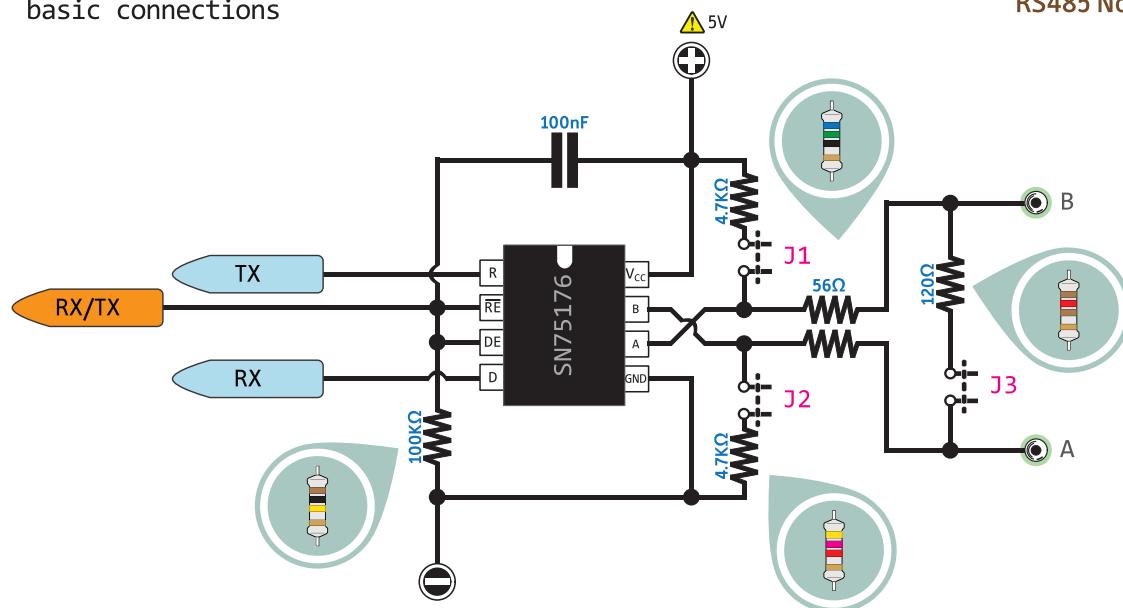
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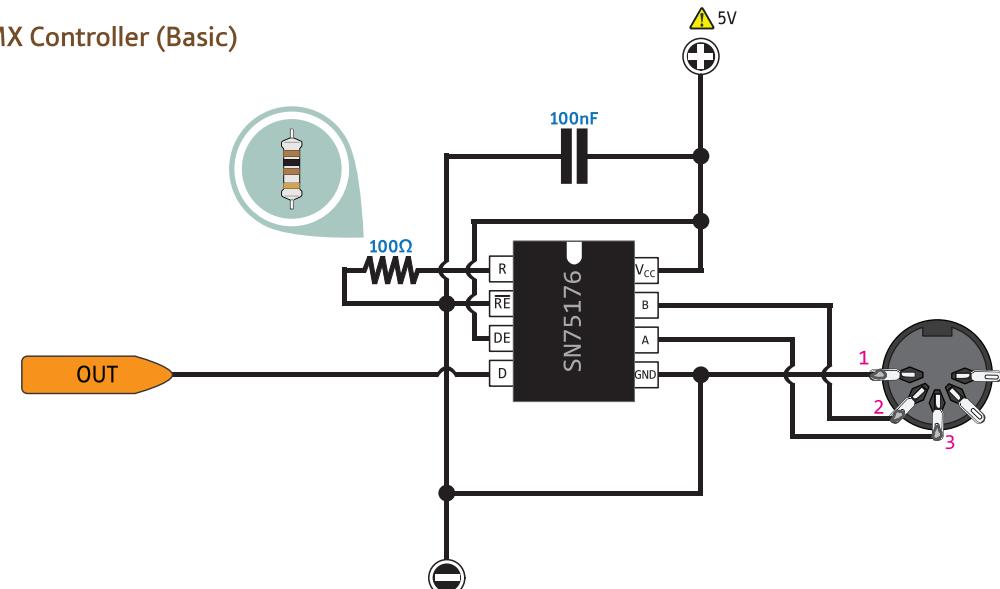
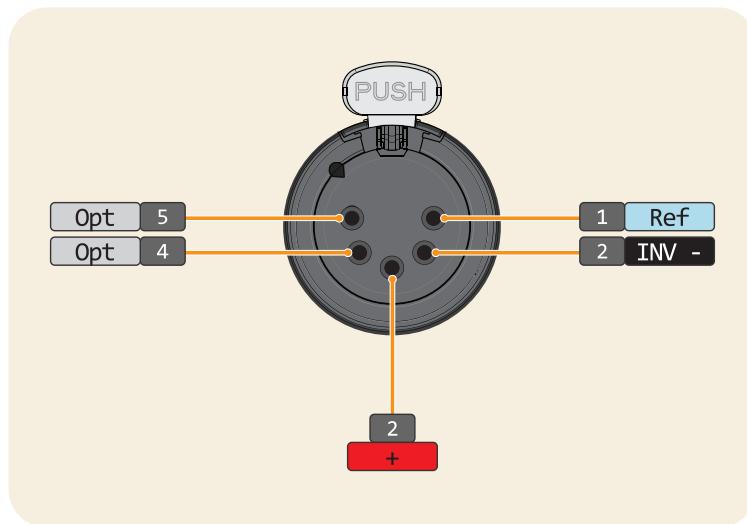
RS485 Node



Node termination jumpers config

First	Middle	Last
Node	Node	Node
J1 on J2 on J3 on	J1 off J2 off J3 off	J1 off J2 off J3 on

DMX Controller (Basic)



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TOLERANCE

GOLD

$\pm 5\%$

SILVER

$\pm 10\%$



BLACK	0	0	x1Ω
BROWN	1	1	x10Ω
RED	2	2	x100Ω
ORANGE	3	3	x1,000Ω
YELLOW	4	4	x10,000Ω
GREEN	5	5	x100,000Ω
BLUE	6	6	x1,000,000Ω
VIOLET	7	7	
GRAY	8	8	
WHITE	9	9	

$$K\Omega = x1,000\Omega$$

$$M\Omega = x1,000,000\Omega$$

MULTIPLIER



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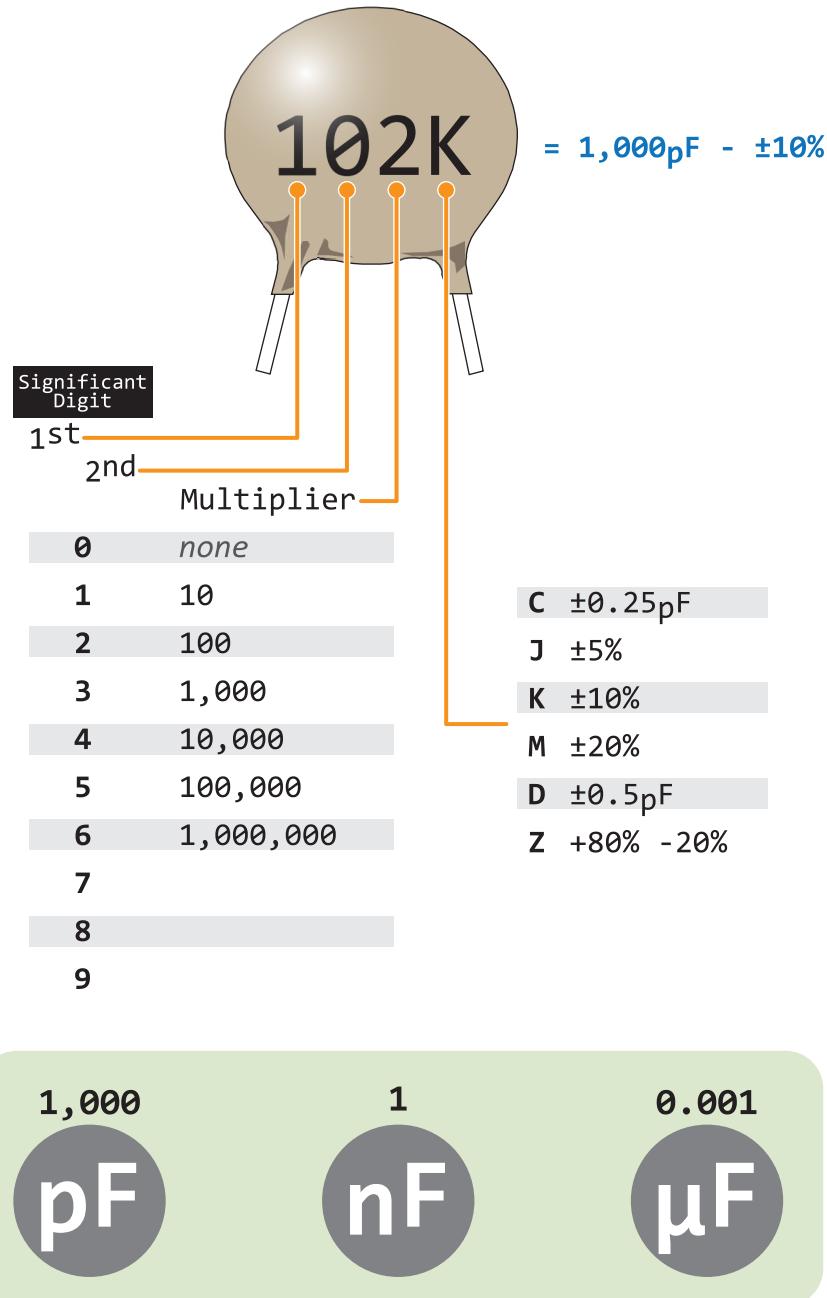


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Ceramic Capacitor Code

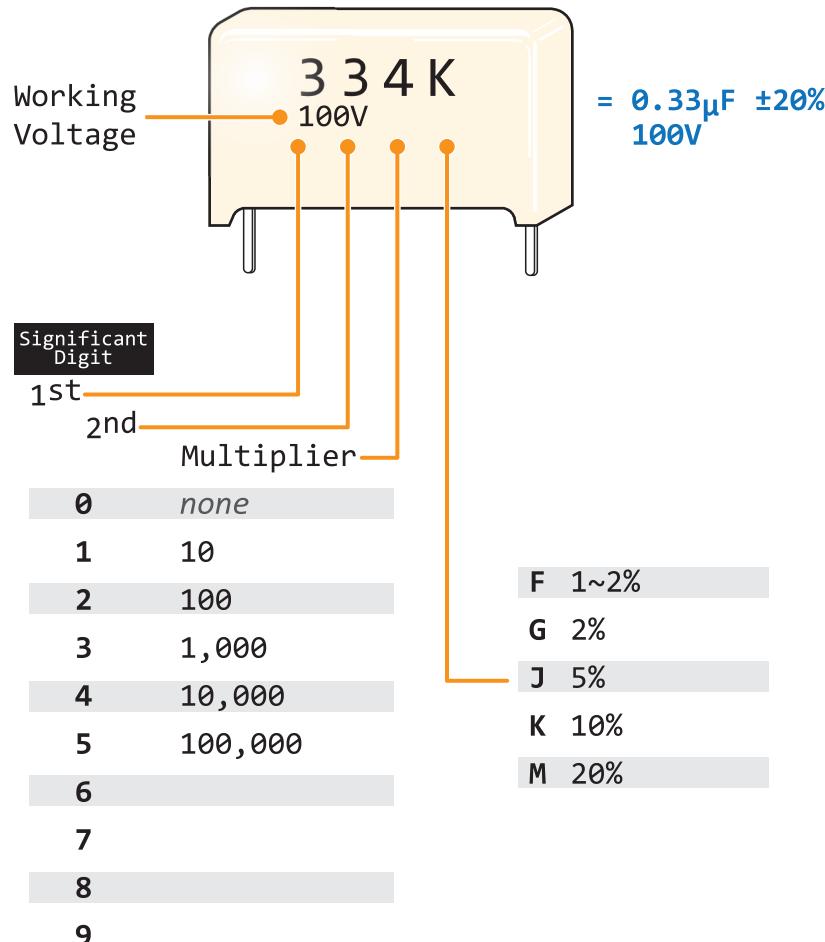


1	1p0	1pF	10	10pF	101	n10	100pF
1.2	1p2	1.2pF	12	12pF	121	n12	120pF
1.5	1p5	1.5pF	15	15pF	151	n15	150pF
1.8	1p8	1.8pF	18	18pF	181	n18	180pF
2.2	2p2	2.2pF	22	22pF	221	n21	220pF
2.7	2p7	2.7pF	27	27pF	271	n27	270pF
3.3	3p3	3.3pF	33	33pF	331	n33	330pF
3.9	3p9	3.9pF	39	39pF	391	n39	390pF
4.7	4p7	4.7pF	47	47pF	471	n47	470pF
5.6	5p6	5.6pF	56	56pF	561	n56	560pF
6.8	6p8	6.8pF	68	68pF	681	n68	680pF
8.2	8p2	8.2pF	82	82pF	821	n82	820pF

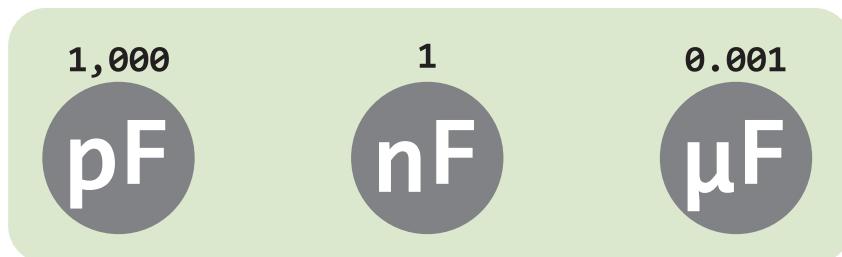




Polyester Film-Mylar Capacitor Code



102	1n	.001	1,000pF	103	10n	.01	10,000pF	104	100n	.1	100,000pF
122	1n2	.0012	1,200pF	123	12n	.012	12,000pF	124	120n	.12	120,000pF
152	1n5	.0015	1,500pF	153	15n	.015	15,000pF	154	150n	.15	150,000pF
182	1n8	.0018	1,800pF	183	18n	.018	18,000pF	184	180n	.18	180,000pF
222	2n2	.0022	2,200pF	223	22n	.022	22,000pF	224	220n	.22	220,000pF
272	2n7	.0027	2,700pF	273	27n	.027	27,000pF	274	270n	.27	270,000pF
332	3n3	.0033	3,300pF	333	33n	.033	33,000pF	334	330n	.33	330,000pF
392	3n9	.0039	3,900pF	393	39n	.039	39,000pF	394	390n	.39	390,000pF
472	4n7	.0047	4,700pF	473	47n	.047	47,000pF	474	470n	.47	470,000pF
562	5n6	.0056	5,600pF	563	56n	.056	56,000pF	564	560n	.56	560,000pF
682	6n8	.0068	6,800pF	683	68n	.068	68,000pF	684	680n	.68	680,000pF
822	8n2	.0082	8,200pF	823	82n	.082	82,000pF	824	820n	.82	820,000pF



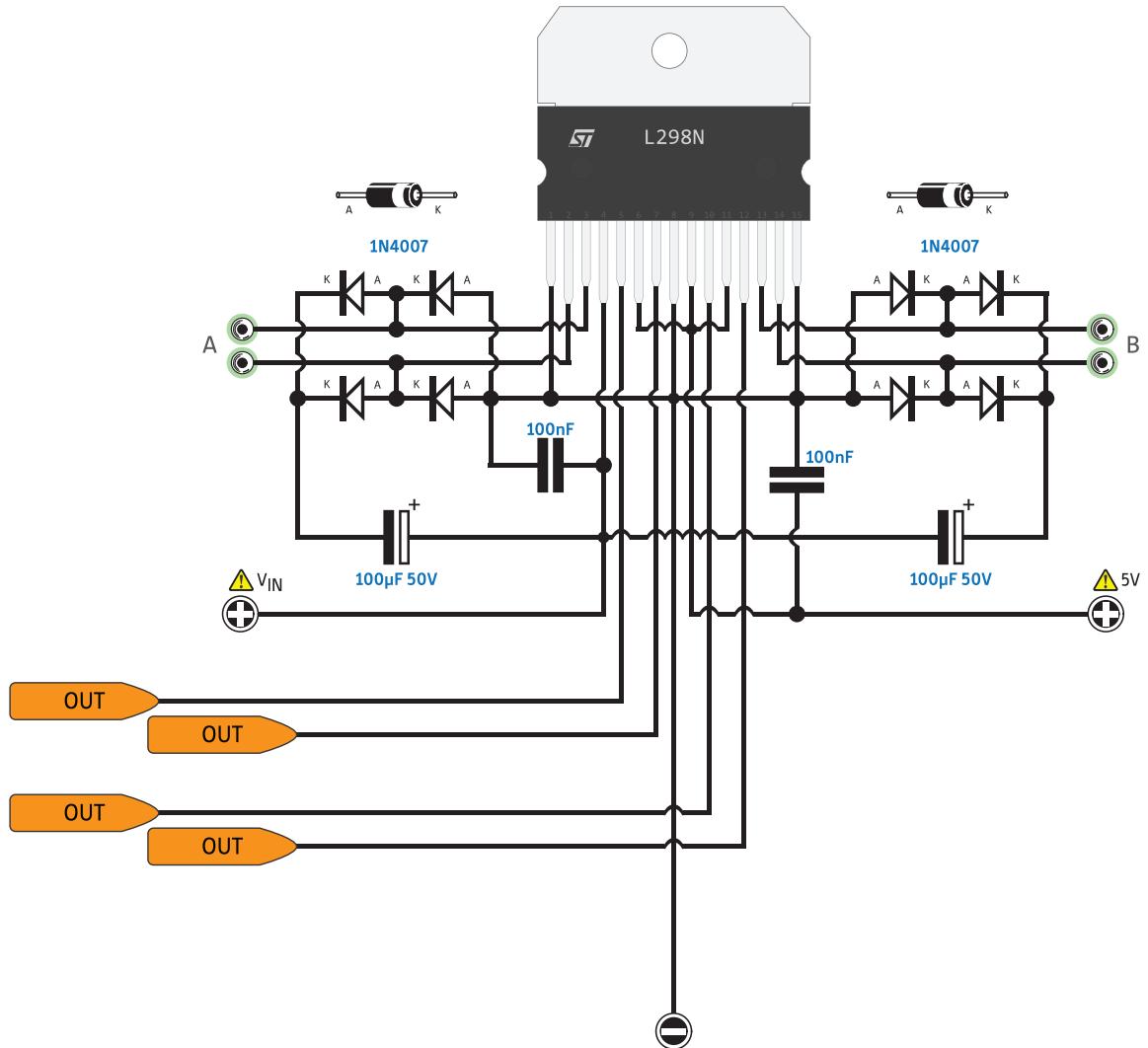
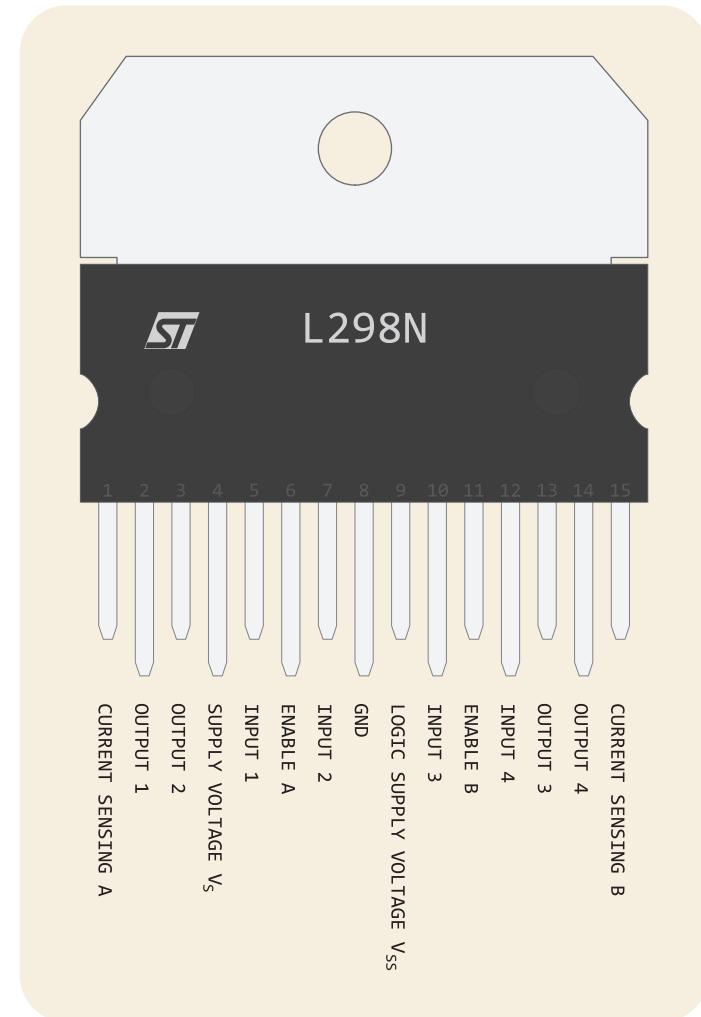
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Drive a Motor (L298)

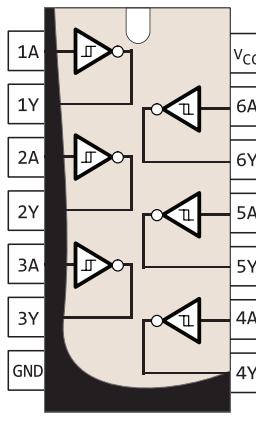


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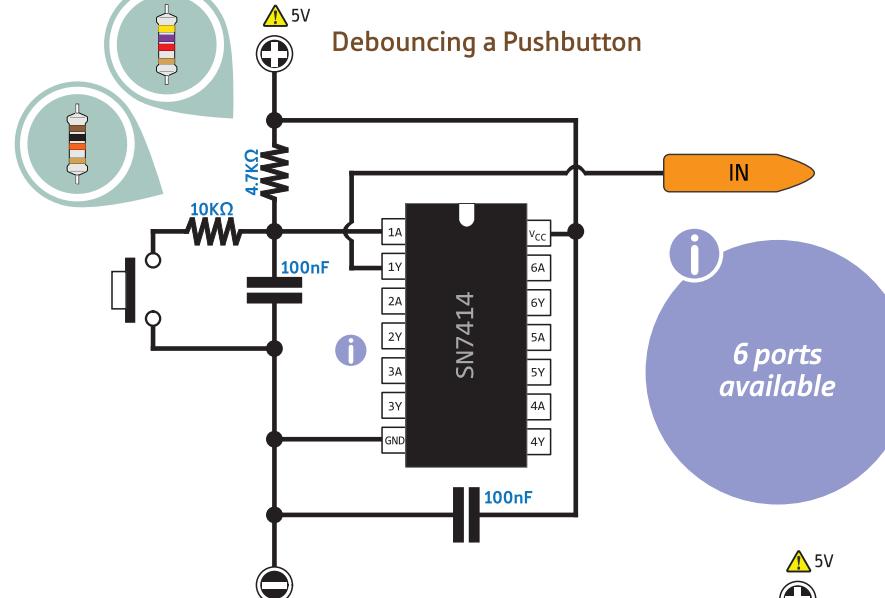


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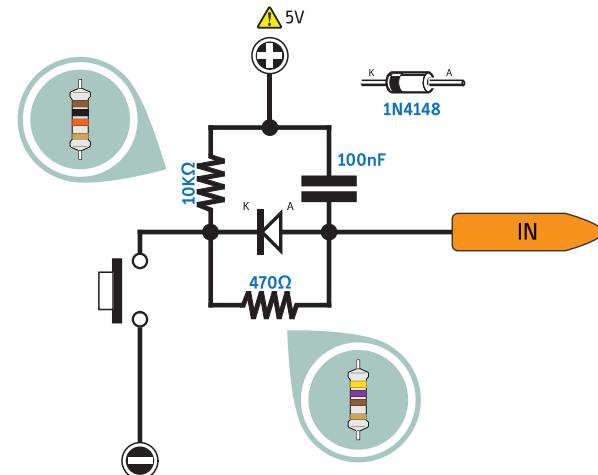


SN7414

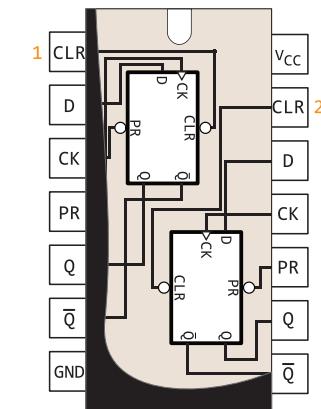
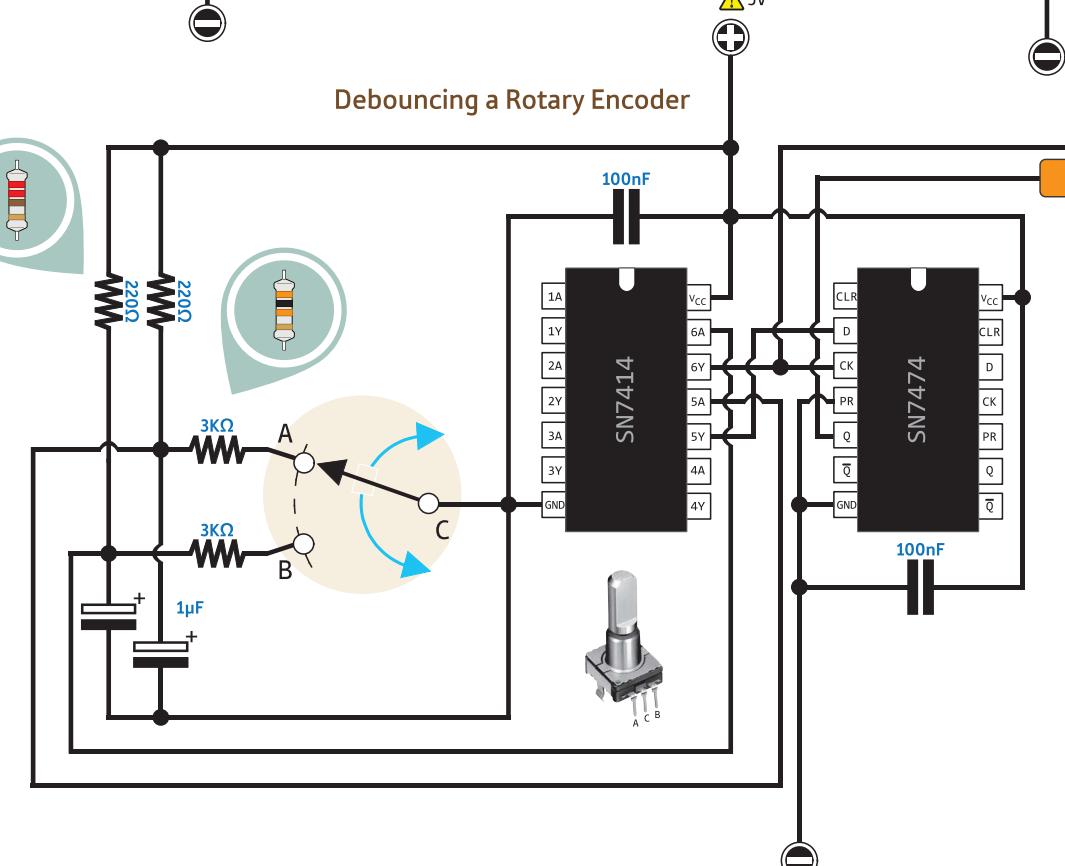


6 ports
available

Simple Debouncer

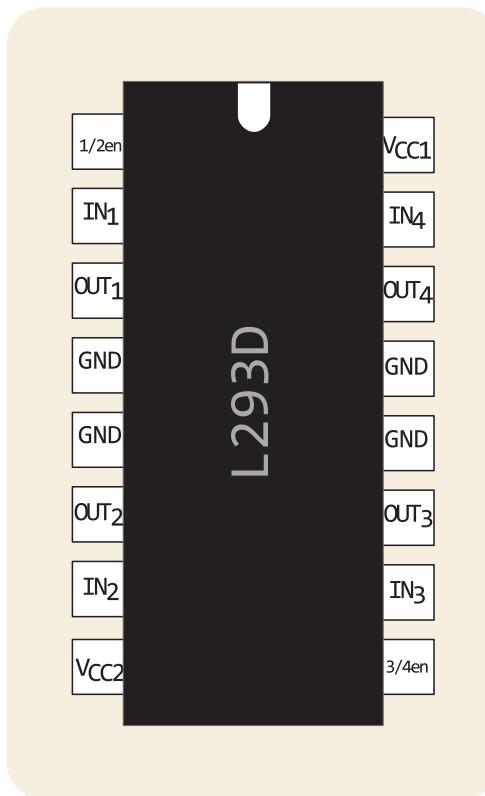


Debouncing a Rotary Encoder

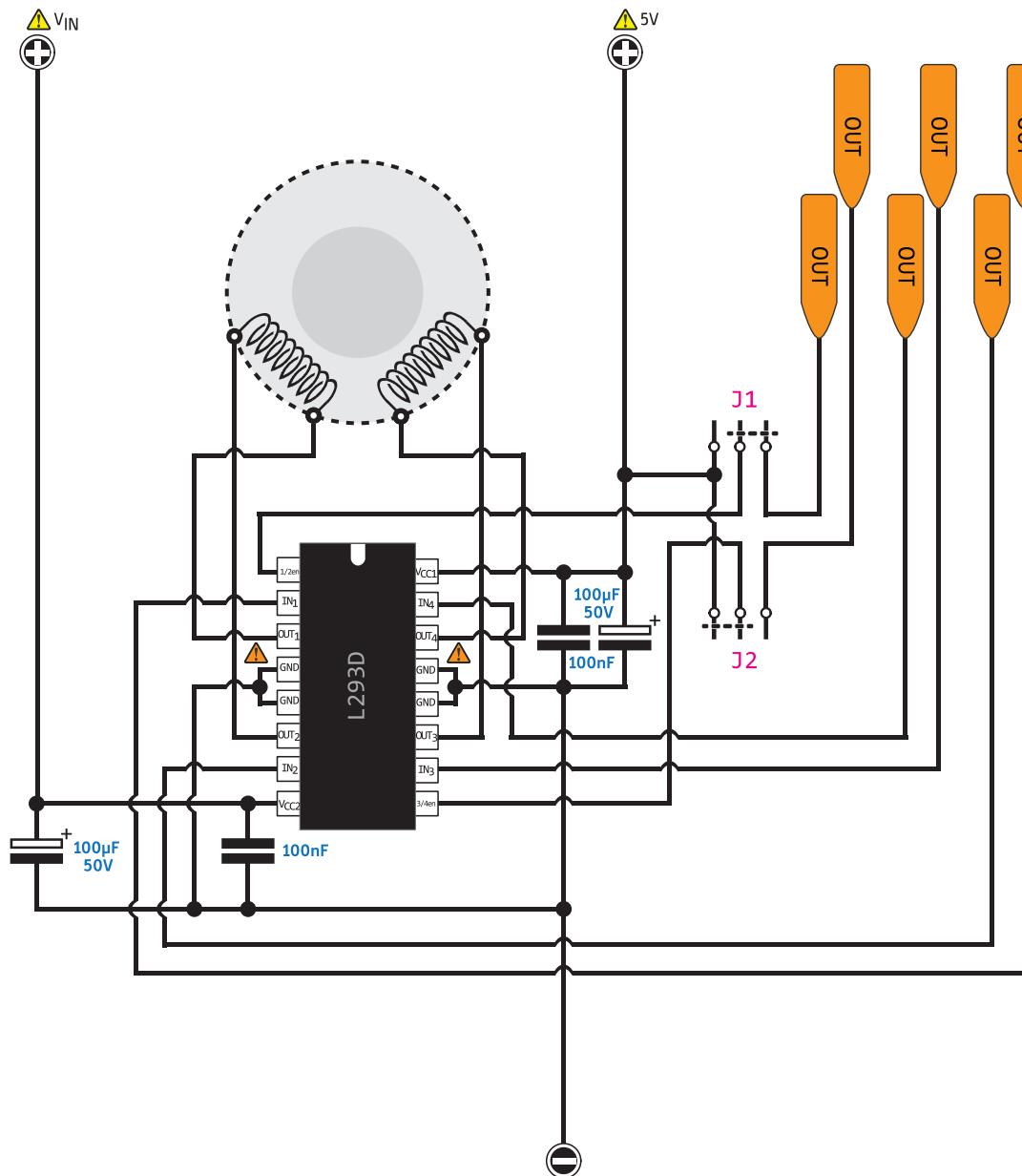


SN7474





Drive a Stepper (L293)



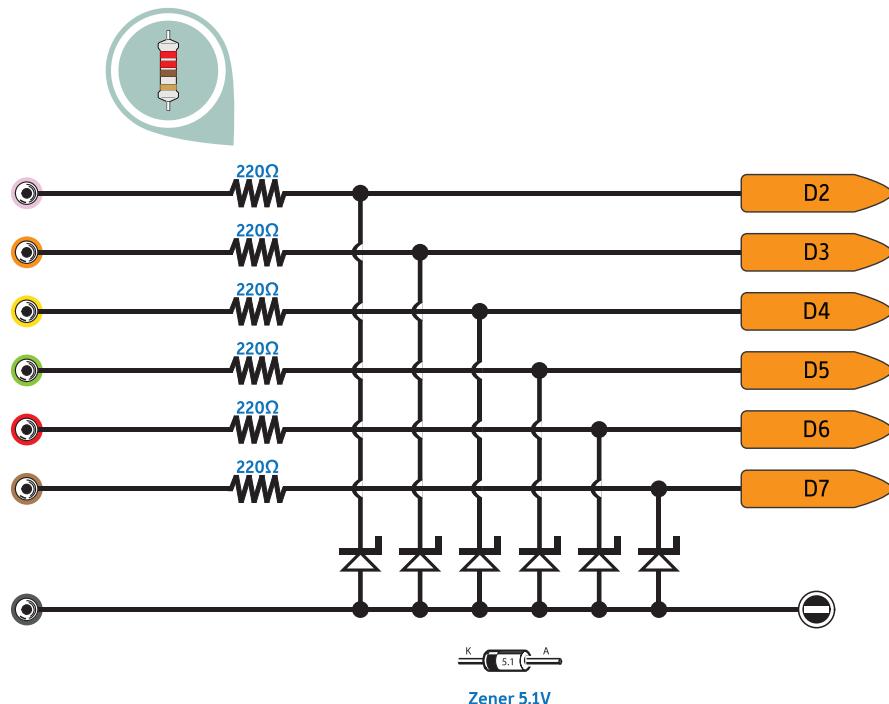
www.pighixxx.com



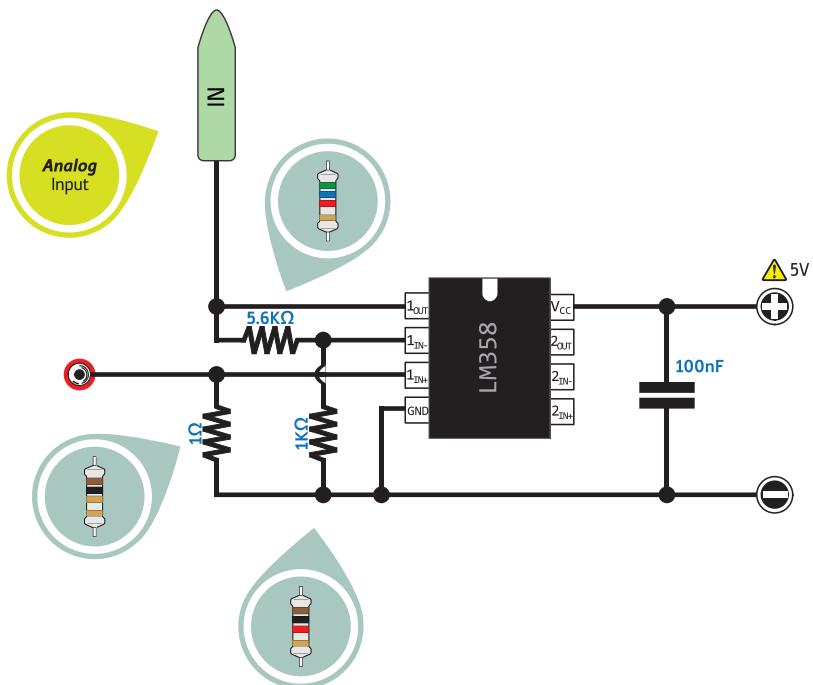
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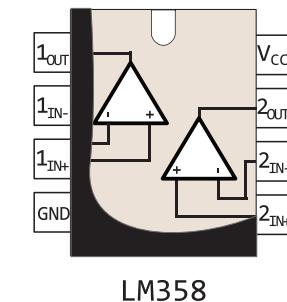
Arduino Logic Analyzer



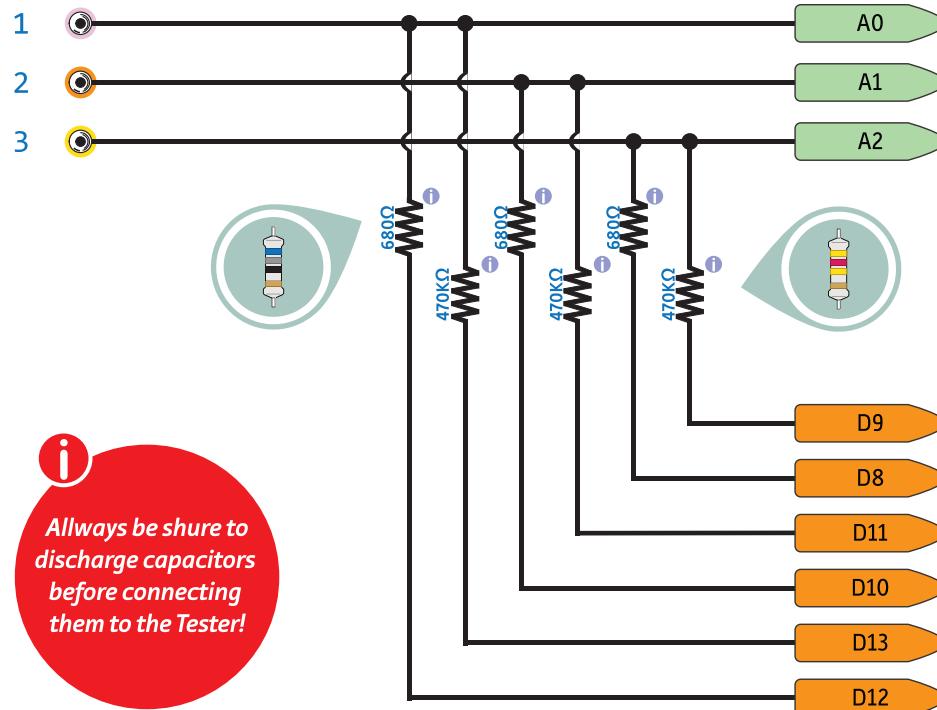
Current Sense



i
*See instructions
at
la.pighixx.com*



Arduino Component Tester (basic)



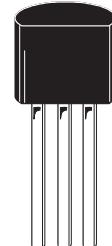
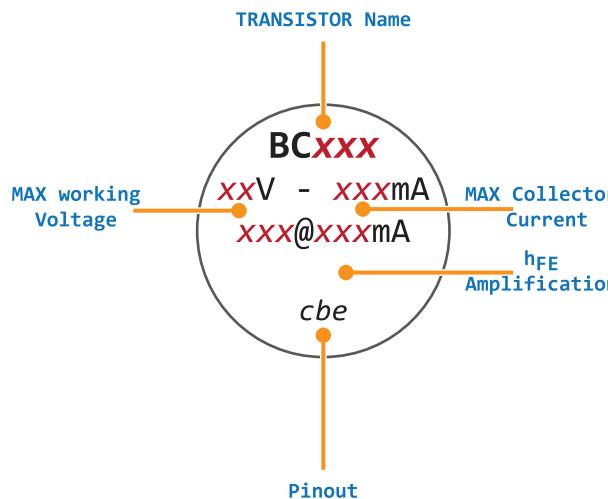
i
Always be shure to
discharge capacitors
before connecting
them to the Tester!

i
To get full
accuracy
use 1% tolerance
resistors

i
Download sketch
at
at.pighixx.com

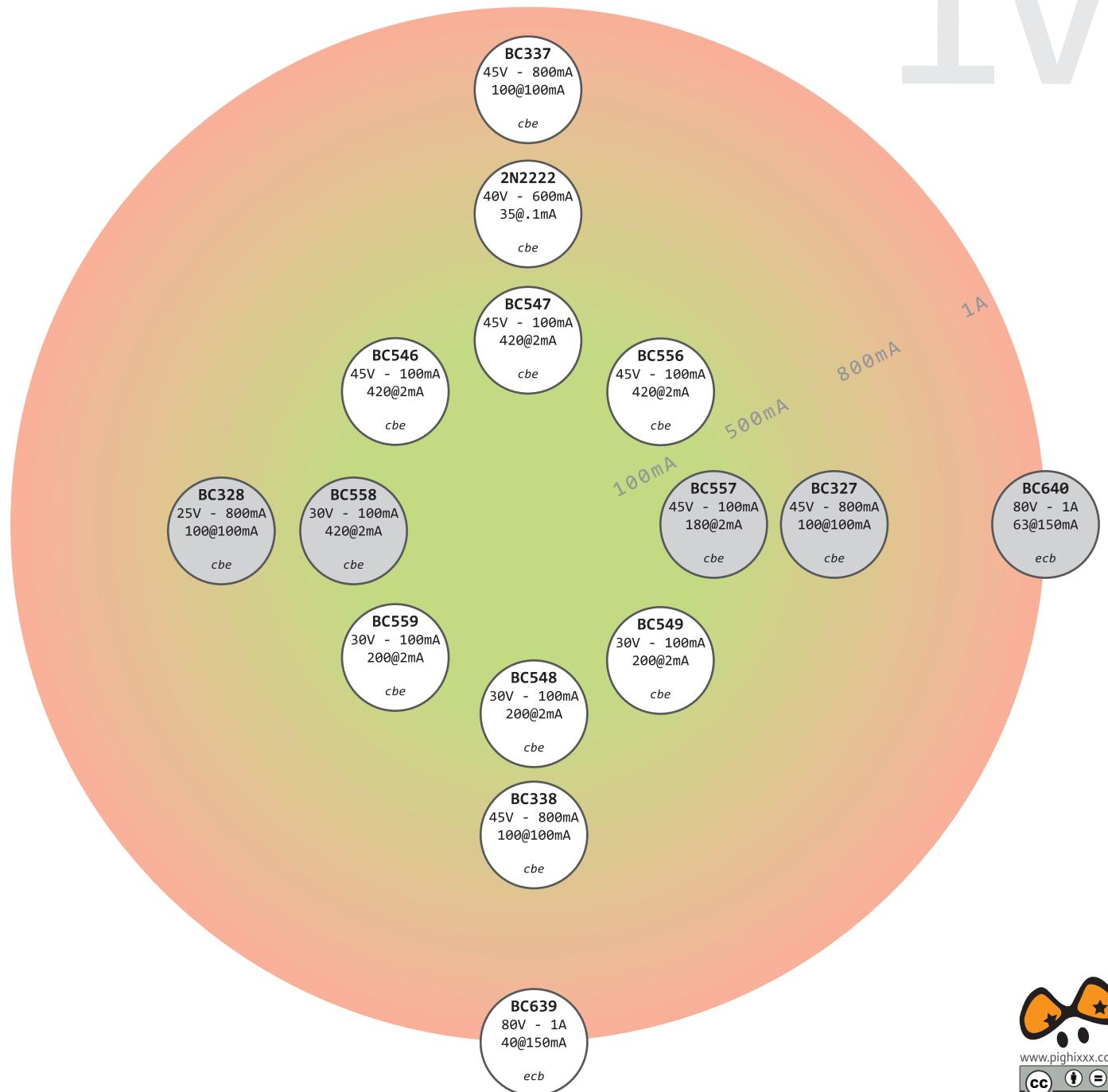
Simple Transistor Comparison Table

IV



NPN

PNP



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25 APR 2013

ver 1 rev 1