Push-It (DIP)

Quantity	Name	Description	Label/Color Code
5	R1–R4, R6	Resistor $220\,\Omega$	RE RE BK BK BR
1	R5	Resistor $1\,\mathrm{k}\Omega$	BR BK BK BR BR
1	R7	Resistor $10\,\mathrm{k}\Omega$	BR BK BK RE BR
7	S1–S7	Push Button	
1	SG1	Speaker	
1	JP1	Pinheader 3x1	
1	LED1	LED 10mm Yellow	
1	LED2	LED 10mm Red	
1	LED3	LED 10mm Green	
1	LED4	LED 10mm Blue	
1	LED7	7-segment display	
2	C1, C2	Ceramic Capacitor $100\,\mathrm{nF}$	104
2	C3, C4	Ceramic Capacitor $22\,\mathrm{pF}$	22
1	IC1	74HC 595	
1	IC2	Microcontroller Atmel Atmega 328P-PU	
1	Q1	16MHz Crystal	
1	POWER	terminal 2-pole	
1		IC-Socket 16-pole	
1		IC-Socket 28-pole	
1		PCB	
1		Battery Holder	
4		Batteries Mignon (AA)	

Difficulty: ●●○○○ Build Time: 1–2 hours

Farblegende: SI = silber; GO = gold; BK = schwarz; BR = braun; RE = rot; OR = orange; YE = gelb; GR = grün; BL = blau; VI = violett; GR = grau; WH = weiß

Safety Information

- ATTENTION: Not suitable for children under 3 years, choking hazard due to small parts that may be swallowed.
- We recommend: Supervision of the assembly and soldering process by an adult.
- Keep these operating instructions in a safe place for later use! It contains important information.
- If the battery is empty, replace it only with a new battery with the same values.
- When soldering, the soldering iron, the solder and also the components being soldered become very hot.
- Always wear safety glasses when soldering and assembling the kit.
- Always use a fire proof soldering pad when soldering! This prevents the components from slipping away.
- To keep the soldering iron safe during assembly, always use a suitable soldering stand.
- The kit is designed for battery operation only.
- CAUTION: Never connect the kit to 230 V mains voltage! There is an absolute danger to life!
- Please take the device to appropriately certified disposal companies at the end of its service life. This is good for the environment and ensures correct disposal.
- Subject to changes and errors.

Disposal

This appliance is labelled in accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). The directive provides the legal framework for the take-back and recycling of waste equipment throughout the EU.

- **packaging**: The packaging is made of environmentally friendly materials and is therefore recyclable. Dispose of packaging materials that are no longer needed accordingly.
- **waste equipment**: Old appliances often still contain valuable materials. Therefore, hand in your old appliance to your retailer or a recycling centre for reuse. Please ask your retailer or your local authority for the current disposal routes.

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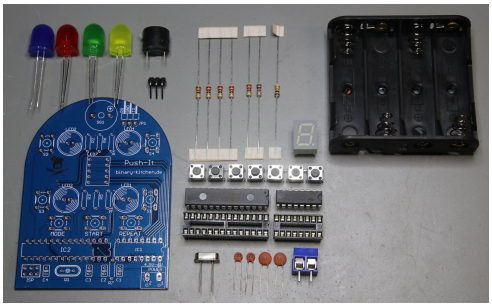
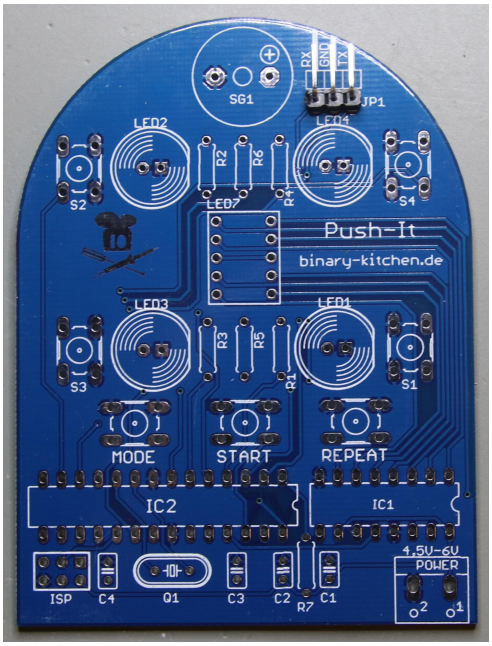
93057 Regensburg
GERMANY

Step 1



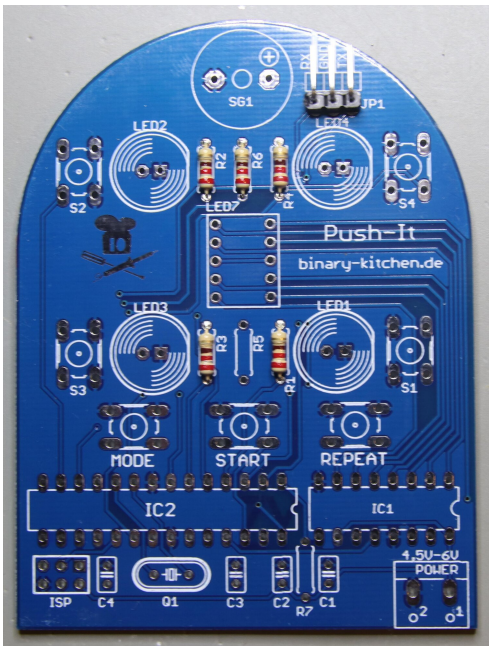
a) Hints:
b) Resistor size can be determined by color coding
c) Alignment of the PCB in such a way, that LED designation can be read normally (see picture)
d) Alignment with resistors does not matter
e) LEDs have a flat side and a shorter leg. Both indicate the negative side
f) The orientation of capacitors doesn't matter, because ceramic capacitors are used

Step 2



a) Soldering the pin header JP1

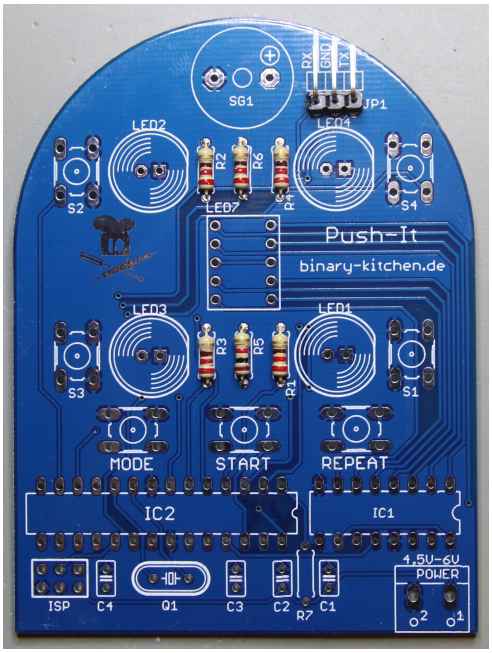
Step 3



a) Solder resistors R1 - R4 and R6 ($220\,\Omega$)
b) The orientation doesn't matter

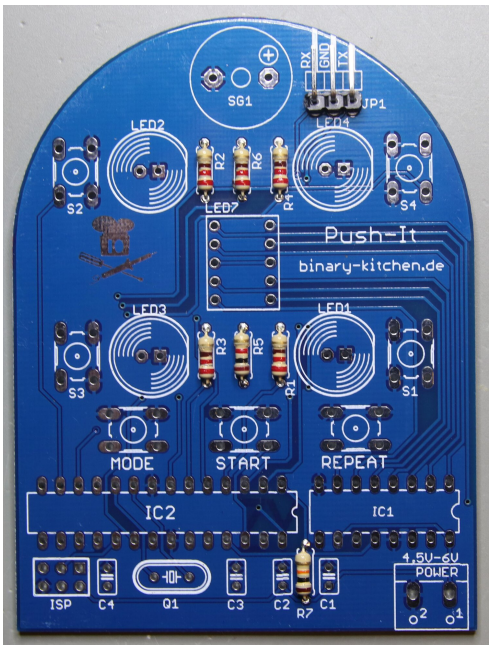
Step 4

a) Solder resistors R5 ($1\,\mathrm{k}\Omega$)
b) orientation does not matter



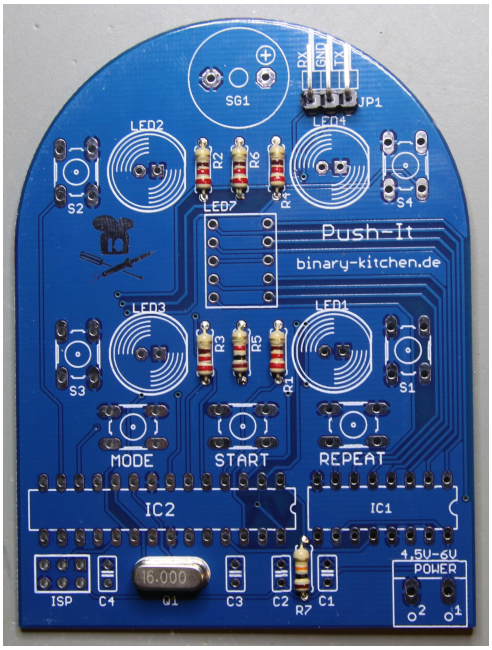
Step 5

a) Solder resistor R7 ($10\,\mathrm{k}\Omega$)
b) orientation does not matter



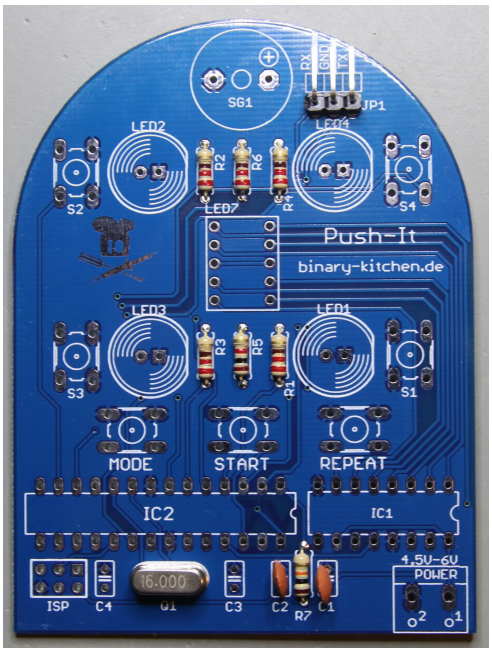
Step 6

a) Solder crystal Q1
b) orientation doesn't matter



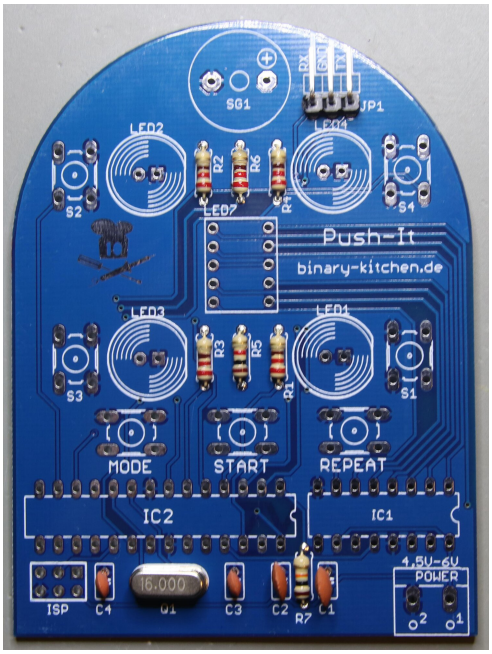
Step 7

a) Solder capacitors C1 and C2 (104)
b) orientation doesn't matter



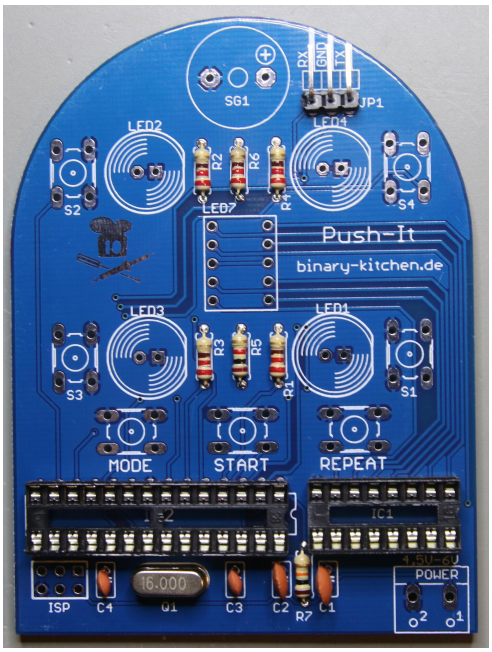
Step 8

a) Solder capacitors C3 and C4 (22)
b) orientation doesn't matter



Step 9

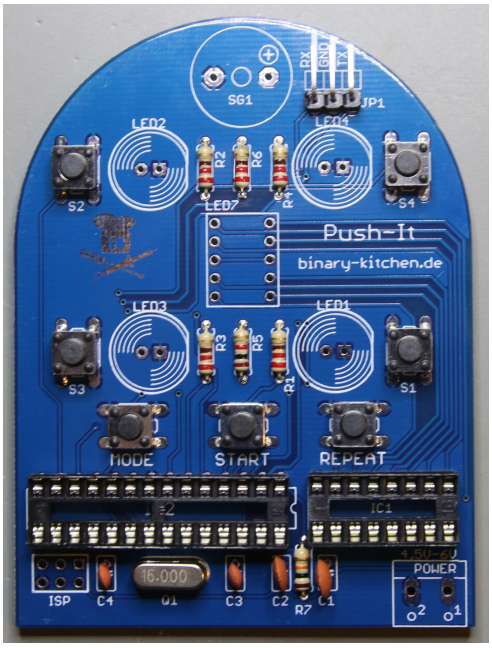
a) Solder IC1 socket as well as IC2 socket with the nose to the right onto the PCB



Step 10

a) Solder switches S1 to S4 as well as MODE, START and REPEAT

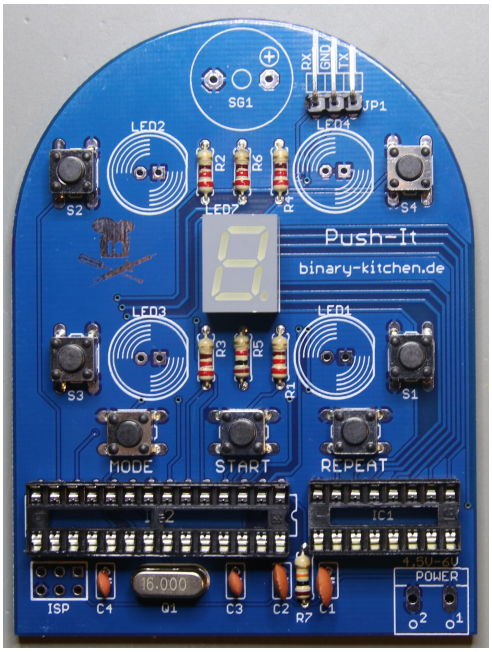
b) Hint: Legs have different distances. Nothing has to be bent. Switch fits exactly



Step 11

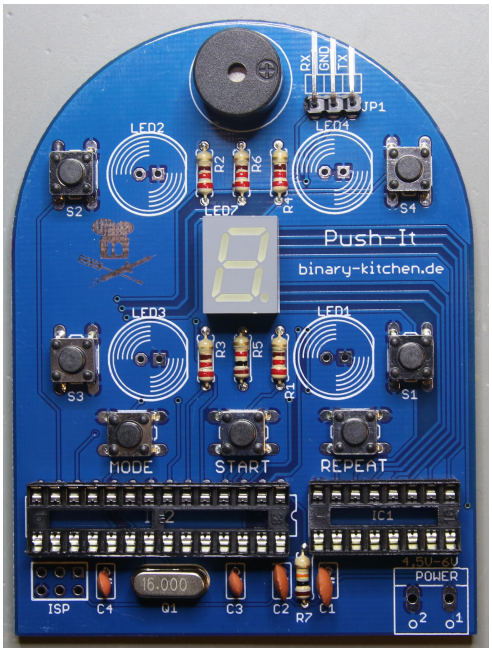
a) solder 7-segment display LED7

b) The dot must be in the lower right corner



Step 12

a) Solder loudspeaker SG1
b) Attention! Alignment is important
c) The printed plus sign must be in line with the PCB
d) Remove the protective sticker if present

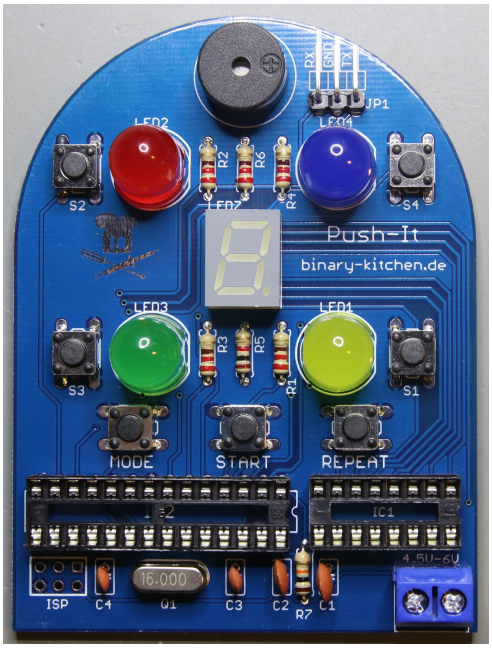


Step 13

a) Solder LED1 to LED4. Note colors according to picture
b) Attention! Alignment is important
c) LEDs have a longer and a shorter leg. The shorter leg indicates the negative side
d) On the PCB the negative side is represented by a flat area on the circle of the LED.

Step 14

a) Solder POWER connector with the opening downwards

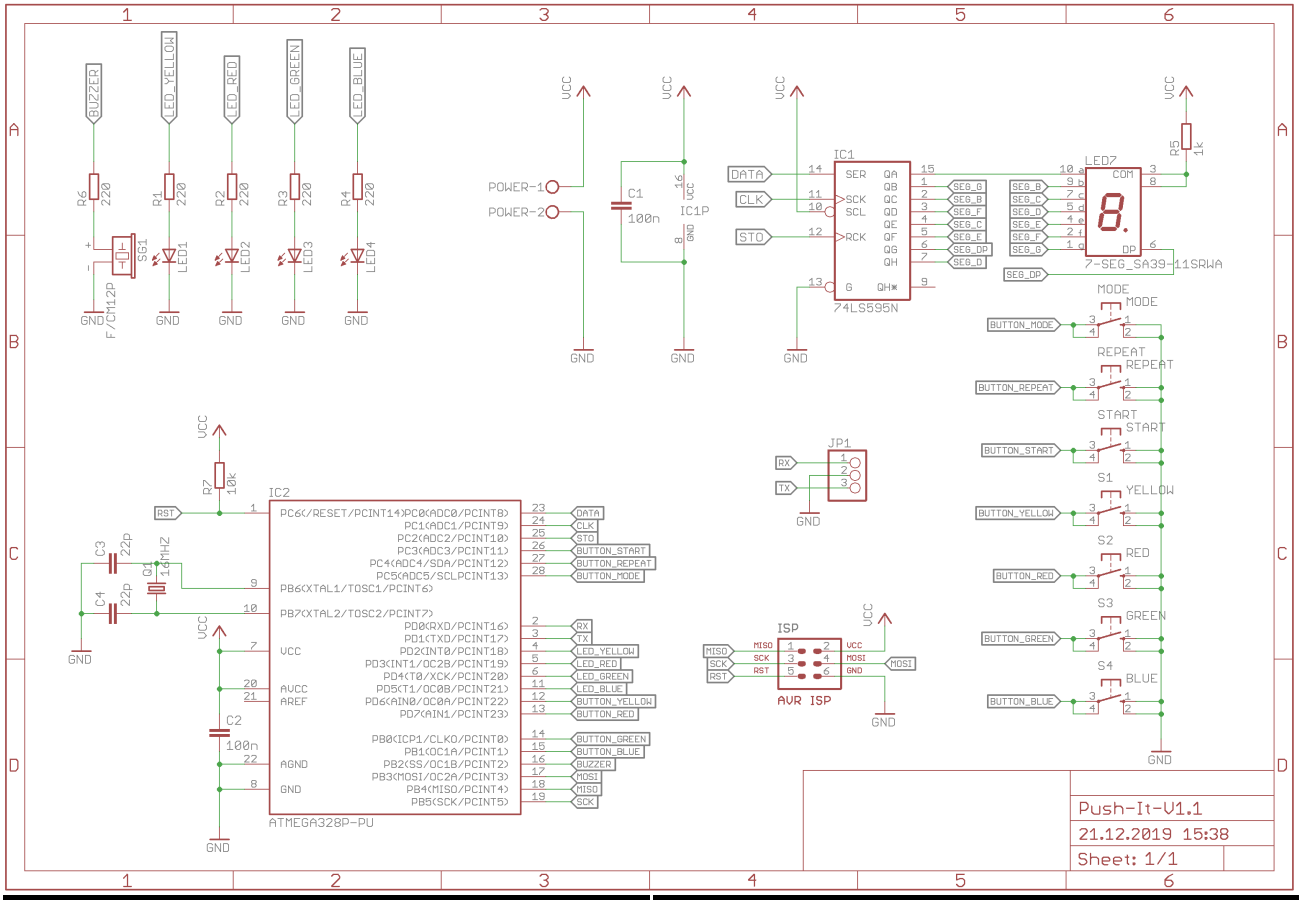


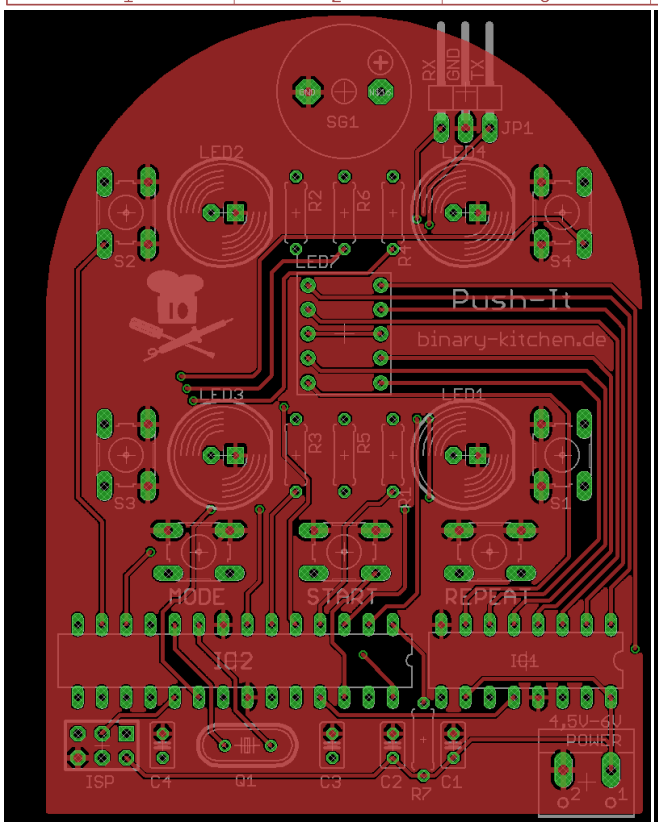
Step 15

a) Insert IC1 and IC2 with the nose to the right into the socket
b) Tip: The legs of the ICs must be bent slightly, to fit into the socket
c) Possibly remove and tin the insulation at the tips of the connecting cables of the battery
d) Screw on the battery (+ red, - black)

Step 16

a) Fix the battery compartment with double-sided tape to the back-side of the board
b) Cover the two ICs with some tape (protection against touch and moisture while playing)
c) Insert the batteries
d) Done!


BUZZER
LED_YELLOW
LED_RED
LED_GREEN
LED_BLUE
R6 220
R1 220
R2 220
R3 220
R4 220
SG1
LED1
LED2
LED3
LED4
F/CM12P
GND
VCC
POWER-1
POWER-2
C1 100n
IC1P
IC1
DATA
CLK
STO
SER
SCK
SCL
RCK
G
QA
QB
QC
QD
QE
QF
QG
QH
74LS595N
SEG_A
SEG_B
SEG_C
SEG_D
SEG_E
SEG_F
SEG_G
SEG_DP
LED7
COM
DP
7-SEG_SA39-11SRWA
R5 1k
MODE
REPEAT
START
S1
YELLOW
S2
RED
S3
GREEN
S4
BLUE
BUTTON_MODE
BUTTON_REPEAT
BUTTON_START
BUTTON_YELLOW
BUTTON_RED
BUTTON_GREEN
BUTTON_BLUE
JP1
RX
TX
ISP
MISO
SCK
RST
MOSI
AVR ISP
R7 10k
IC2
RST
C3 22p
C4 22p
Q1 16MHZ
C2 100n
AVCC
AREF
AGND
PC6(/RESET/PCINT14)PC0(ADC0/PCINT8)
PC1(ADC1/PCINT9)
PC2(ADC2/PCINT10)
PC3(ADC3/PCINT11)
PC4(ADC4/SDA/PCINT12)
PC5(ADC5/SCL/PCINT13)
PB6(XTAL1/TOSC1/PCINT6)
PB7(XTAL2/TOSC2/PCINT7)
PD0(RXD/PCINT16)
PD1(TXD/PCINT17)
PD2(INT0/PCINT18)
PD3(INT1/OC2B/PCINT19)
PD4(T0/XCK/PCINT20)
PD5(T1/OC0B/PCINT21)
PD6(AIN0/OC0A/PCINT22)
PD7(AIN1/PCINT23)
PB0(ICP1/CLKO/PCINT0)
PB1(OC1A/PCINT1)
PB2(SS/OC1B/PCINT2)
PB3(MOSI/OC2A/PCINT3)
PB4(MISO/PCINT4)
PB5(SCK/PCINT5)
ATMEGA328P-PU
Push-It-V1.1
21.12.2019 15:38
Sheet: 1/1


SG1
JP1
LED2
LED7
Push-It
binary-kitchen.de
LED3
LED1
S2
S4
S3
S1
MODE
START
REPEAT
IC2
IC1
ISP
C4
Q1
C3
C2
R7
C1
4,5V-6V
POWER