SmaTrig 2.1

DIY Guide

instructions   part list   assembly plan   schematics   drill aid   label   pcb

May 15, 2014

0.1 Instructions

Solder the SMD side first. Use these images for reference. Please observe the polarity of the AVR! If you are not familiar with SMD, read one of the tutorials in the web. Proceed with the THT parts. There are a few critical points. The **switch** (9.5 mm over-all height) should be mounted about 1 mm above the PCB.
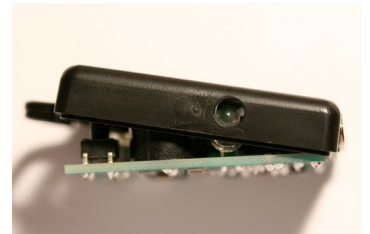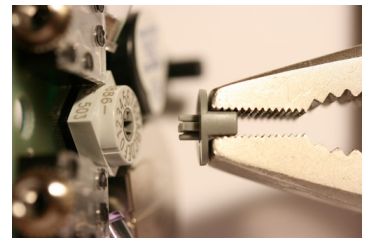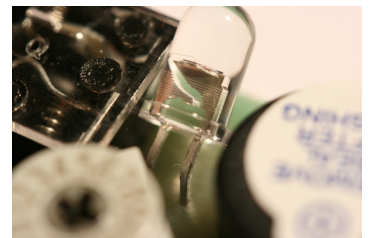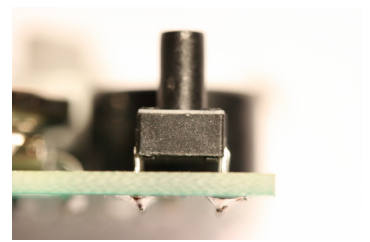
The **code switch** should be mounted about **1.5 mm** above the PCB. A spacer (e.g. a piece of PBC) should be used to avoid forces on the PCB pads.

The **IR-LED** and the **photo diode** should be bend to $45°$ for easier insertion of the assembled PCB into the enclosure. Watch the polarity of the diodes! Different types have different markings (compare SFH484 and LD274).

Now, insert the assembled PCB into the enclosure. Remove the **code switch knob** with flat pliers or a knife before. Don't forget to remove the protective seal from the buzzer.

While inserting the PCB the diodes should snap into the side holes and bend to $90°$. Use tweezers if necessary.

Now the label can be attached. Peel of the protection foil in one corner and align the label (switch, dial) first.

0.2 Part list

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Part         Value              Device         Vendor          Comment


-- SMD --
C1           1u                 C1206          ...
C2           1u                 C1206          ...
Q1           32.768kHz          C1206          Reichelt (32,768 PGC-12,5)
R1           220k               R1206          ...
R2           3k3                R1206          ...
R3           3M3                R1206          ...
R4           3M3                R1206          ...
R5           3M3                R1206          ...
R6           3M3                R1206          ...
R7           3k3                R1206          ...
R8           220k               R1206          ...
IC1          MEGA88V/PV/PA      TQFP32-08      ...             V/PV/PA version
T1           BSS138             SOT23          ...             low Vgs type
T2           BSS138             SOT23          ...             low Vgs type
T3           BSS138             SOT23          ...             low Vgs type
-- THT --
D1           SFH484 IR-LED      LED5MM         Segor/Reichelt  narrow angle type
PH1          SFH203 daylight    LED5MM         Segor/Reichelt  daylight type
S1           3301B              tact. switch   Reichelt        9.5mm total height
SW1          PT65-503           DIP6           Segor           by Hartmann
H1           KZH20P             batt holder    Segor/Reichelt  for 2032 battery
J            wire bridge        -              DIY             use a piece of wire
B1           EPM121             dia=14mm       Reichelt        7.5mm raster
X1           EBS35              EBS35          Reichelt        3.5mm jack
X2           EBS35              EBS35          Reichelt        3.5mm jack
-- OTHER --
PCB          -                  -              DIY
distance plate for code switch                 DIY             ~1.5mm, use old PCB
enclosure 2046 sw              -               Segor           replacement: 2044
hot shoe mount                -               DIY
label                         -               DIY


see:
www.segor.de
www.reichelt.de
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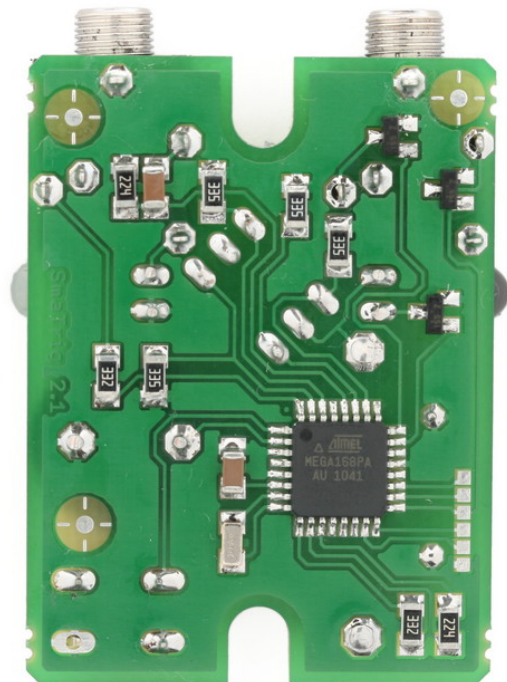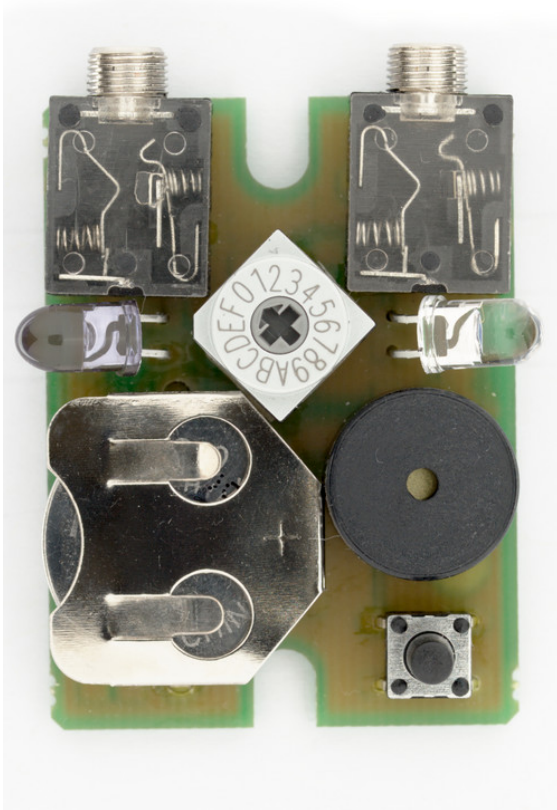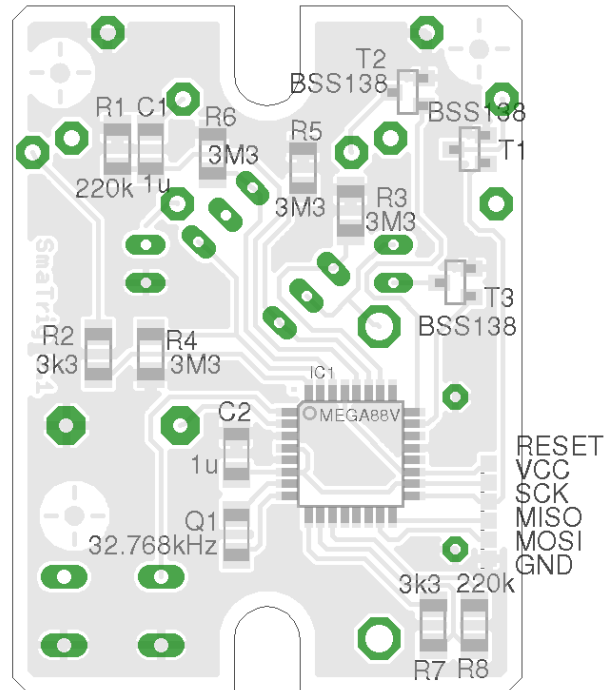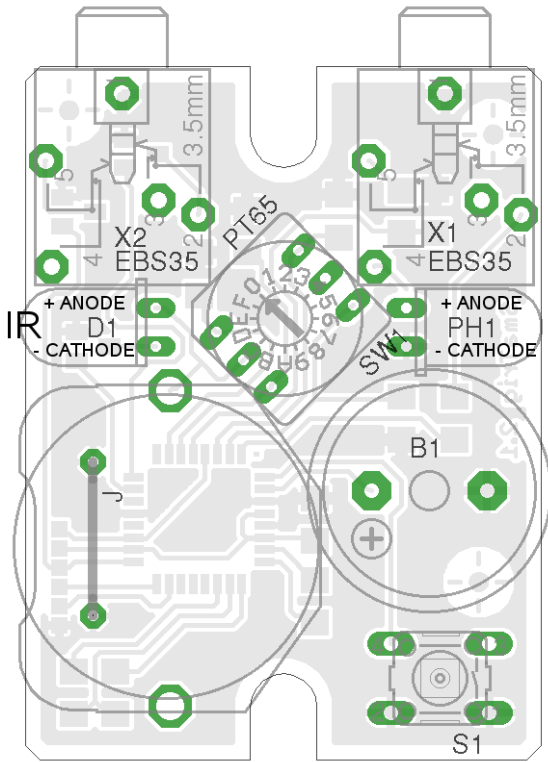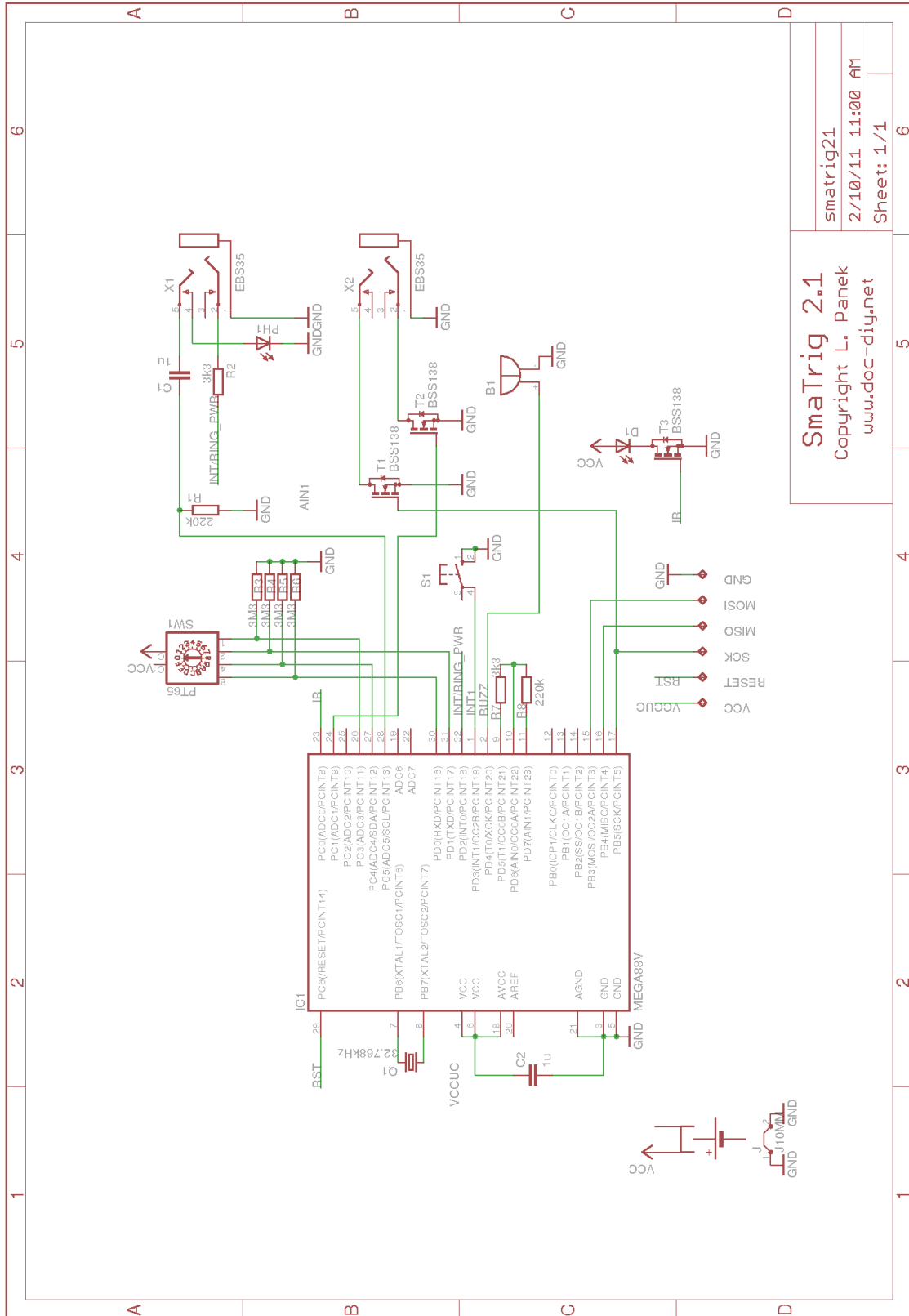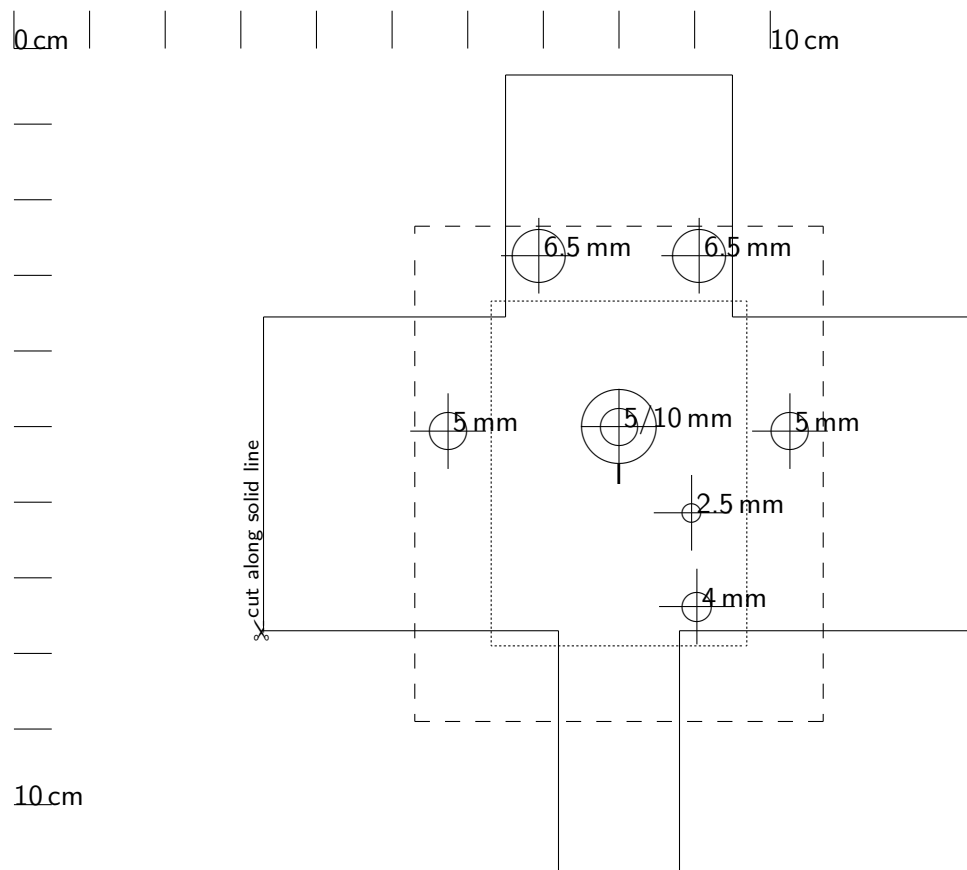
0.3 Assembly plan

0.4 Schematics

0.5 Drill aid

1 mm = 0.254 inch, print without scaling!

0 cm | | | | | | | | | 10 cm

6.5 mm   6.5 mm

5 mm   5 / 10 mm   5 mm

2.5 mm

4 mm

cut along solid line

10 cm

SENSOR PHOTO DIODE · CAMERA · IR · OFF · LONG EXP · ((8)) · ((2)) · ((1/2))

1:1" 5:15" 9:4'   13:1h
2:2" 6:30" 10:8' 14:2h
3:4" 7:1'   11:15' 15:4h
4:8" 8:2'   12:30' 16:8h

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0.7 PCB (34x45.7 mm)