

**REFRIGERATOR CLOSING WARNING**  
CODE 911 **LEVEL 1**

Refrigerator closing warning circuit should be placed in the refrigerator. When we forget to close the refrigerator, it consumes current, makes compressor working too hard and also make food damaged. This circuit will count time according to selling. Whenever refrigerator is opened too lime, this circuit will work out.

**Technical specifications:**

- power supply: 9 to 12VDC.
- consumption: 20 to 25mA max.
- start working timer: adjustable from 5 to 50 seconds.
- dimensions: 2.22 x 1.33 inches

**How to works:**

This circuit uses photo-transistor to detect light. Normally condition when we close the refrigerator, the resistance of photo-transistor is increase and TR1 does not work as well as TR2 to TR7 and dynamic buzzer while C1 charges voltage through R3, D1. When we open the refrigerator, C1 will discharge voltage till TR2 cannot work, TR3 to TR7 are working. TR4, TR5 will created frequency and drive to dynamic buzzer by TR7 is amplified this frequency. If the refrigerator is still opened, dynamic buzzer is also still make sound. When we close the refrigerator, C1 will start charging and dynamic buzzer will not make sound. This circuit can be set 5 to 50 seconds length by adjusting VR1.

**PCB assembly:**

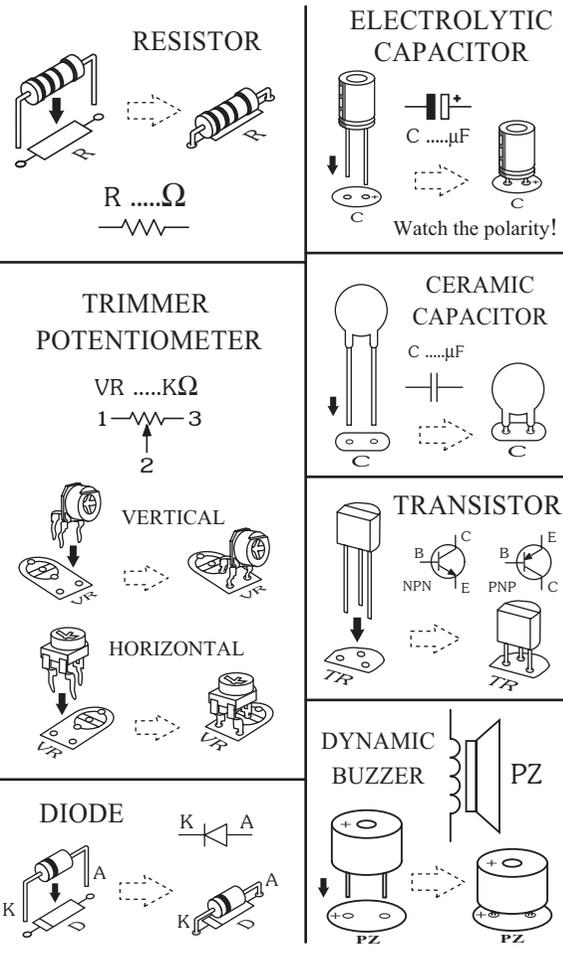
Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. All components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. The LED has a flat spot on the body which lines up with the line on the overlay. Now check that you really did mount them all the right way round!

**Testing:**

Rotating VR1 max. counterclockwise and connect 9-

volt battery to circuit. dynamic buzzer will create sound. Block photo-transistor by hand, sound will be stopped, keeping hand off from photo-transistor and wait for 5 seconds, the sound will be create again. Rotating VR1 clockwise, blocking photo-transistor approximate 5 seconds, dynamic buzzer will not create sound. Waiting approximate 50 to 60 seconds, dynamic buzzer will create sound again under normal condition and ready to be used.

Figure 1. Installing the components



**Troubleshooting:**

The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.

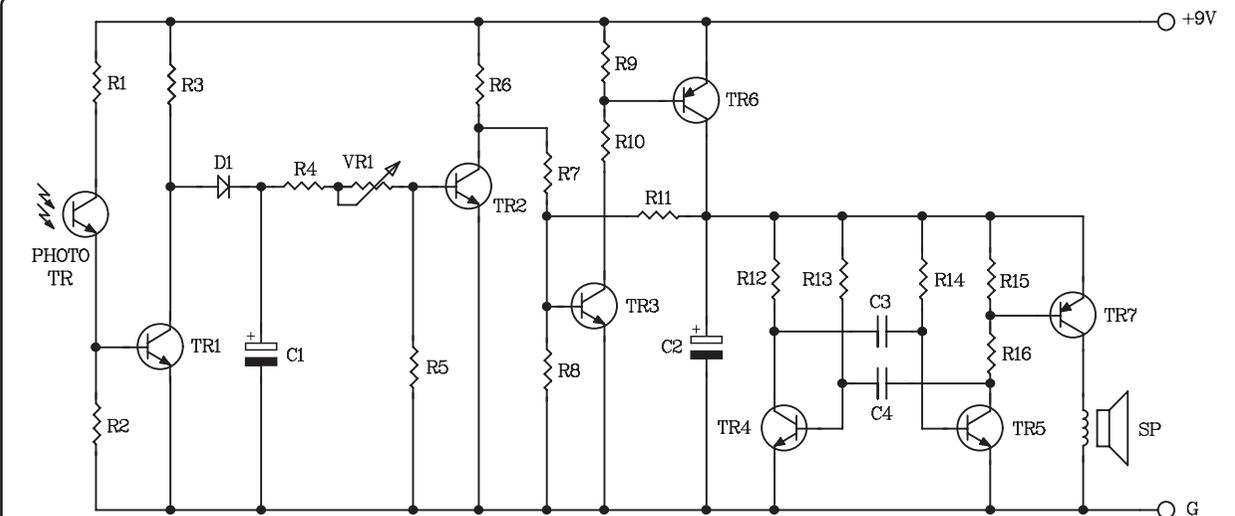
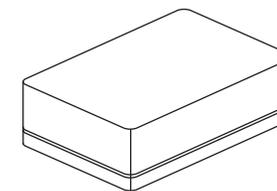
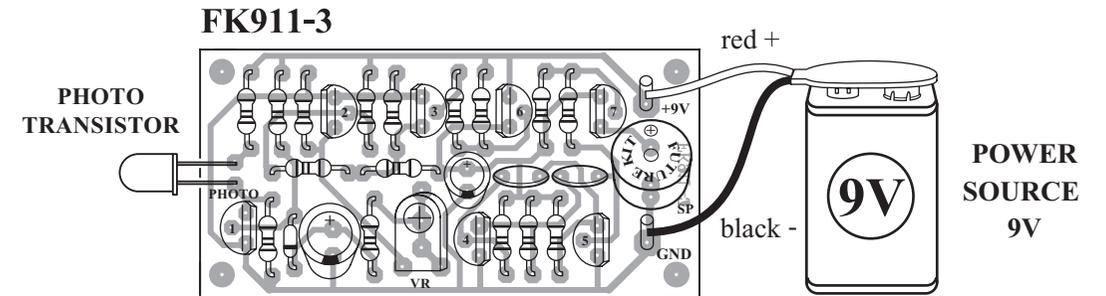


Figure 2. Refrigerator closing warning circuit

Figure 3. Connections



**NOTE:**

FUTURE BOX FB03 is suitable for this kit.

**NEW KIT SET**

CODE FK	DESCRIPTION	POWER SUPPLY
511	TWO FUNCTION INFRARED SENSOR	12VDC
674	POWER AMP. 2W. MONO WITH SPEAKER	9-12VDC
675	POWER AMP. 2+2W. STEREO WITH SPEAKER	9-12VDC