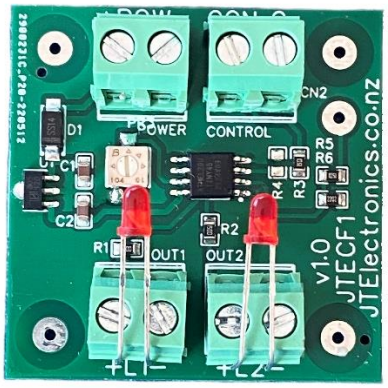
JTElectronics Grade Crossing LED Flasher Module

For Model Railway

Model: JTECF1



The JTECF1 is a low cost LED flasher module which alternately flashes two LED's as used on model railway grade crossing signals, or other uses for alternately flashing two LED's. The LED flash rate is approx. 0.5Hz very similar to real railway grade crossing signals. The JTECF1 module is CONtrolled (turned on) by applying a Ground/Negative signal to the "CON" control input screw terminal - you can connect the CON and G terminals together to turn it on. The JTECF1 is a great companion to the JTEBD1 block detector, or maybe the JTEILD1 infra-red detector, or even reed switches, which can be used to trigger the JTECF1 crossing flasher module as your train approaches a crossing.

The JTECF1 module can be powered from 7 to 24 volts DC or 16 volts AC. It can also be powered from your DCC track rails, DCC accessory wiring bus.

The LED's must be connected in a common ground (common cathode) configuration and the JTECF1 is supplied with two 3mm red LED's as shown in the photo.

There is also a "delay" adjustment so the LED's will continue flashing after the "CONtrol" signal is removed from the JTECF1 input, and this turn-off delay can be adjusted from 1 to 30 seconds.

WHAT YOU DON'T GET…

The JTECF1 module will be damaged by incorrectly connecting power to the wrong terminals. Make sure you connect your AC or DC power supply to the POW+ and GND terminals ONLY.

PLEASE REFER TO THE WIRING DIAGRAMS IN THIS DATASHEET FOR CORRECT WIRING INFORMATION

Like most electronic equipment the JTECF1 circuit boards contain static sensitive devices and may be damaged by high voltages present during electrostatic discharge. Avoid electrostatic discharge by handling the JTECF1 module as little as possible. To prevent damage, we suggest you put the JTECF1 module into an enclosure or locate it somewhere protected from contact with random external objects...

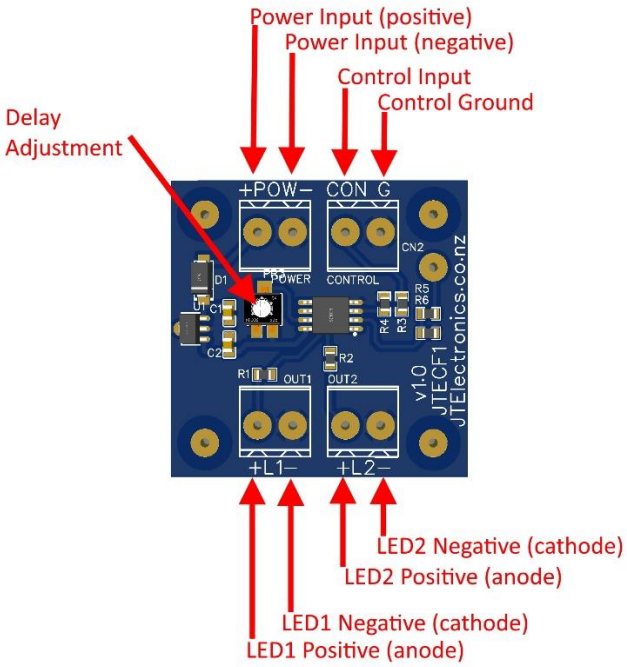
JTECF1 SPECIFICATIONS

LENGTH	43mm
WIDTH	43mm
HEIGHT	16mm

SUPPLY VOLTAGE	7 to 24 Volts DC, or 6 to 16 volts AC
SUPPLY CURRENT (IDLE)	20mA
SUPPLY CURRENT (FLASHING)	40 mA

This document is updated from time to time as new information becomes available – usually due to people asking relevant questions regarding usage or configuration. The "Document Updated" date in the bottom-right corner of each page shows what document date you have. The latest version of this datasheet document can be downloaded from http://www.jtelectronics.co.nz/products/documents/ or Google "JTECF1"…

JTECF1 MODULE – WIRING DIAGRAM

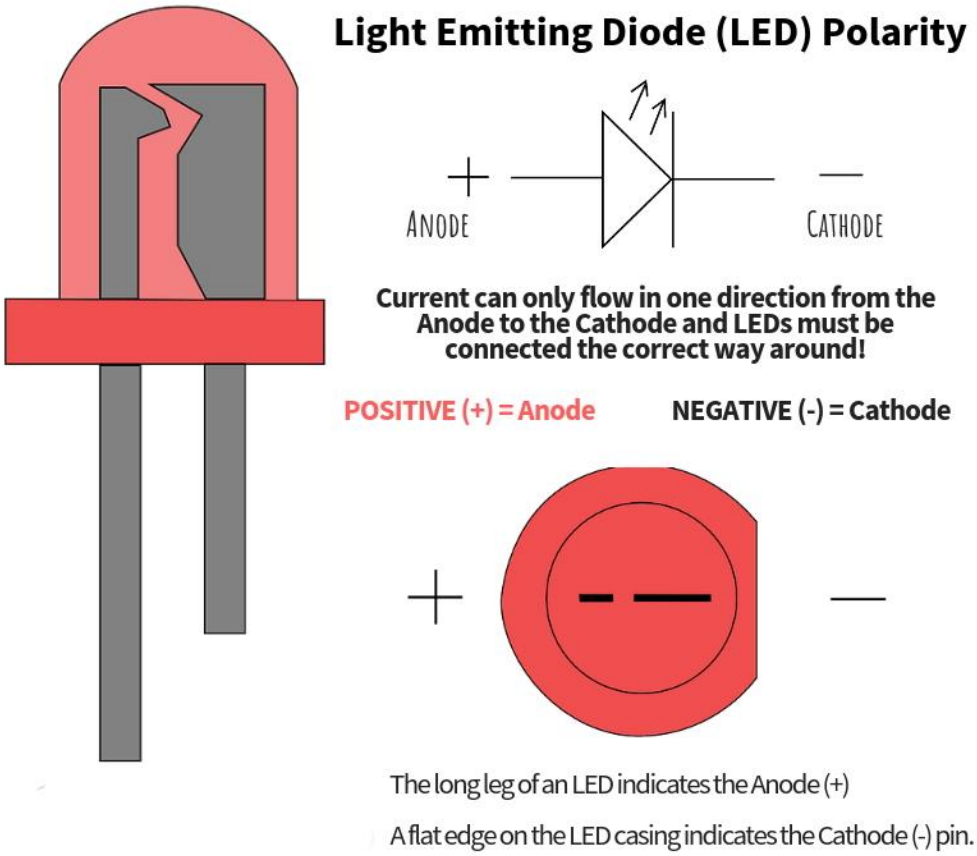


- Power input can be 7 to 24 volts DC, or 6 to 16 volts AC, ideally about 12 volts DC
- "Power Negative", "LED1 Negative", "LED2 Negative" and "Control Ground" terminals are all connected internally
- A Negative/Ground signal on the "Control Input" will turn on the flasher module
- The "Delay Adjustment" control increases the turn-off delay when turned clockwise
- LED's must be connected in "Common Cathode" configuration meaning the LED1 Negative and LED2 Negative wires are effectively connected together. Do not connect the LED1 Positive and LED2 Positive wires together (Common Anode configuration).

LED WIRING INFORMATION

LED's must always be connected with the correct polarity for them to work. They have a positive wire (anode) and a negative wire (cathode) and there are two methods to clearly identify which wire is which - as shown in the diagrams below.

1. If the LED wires have not been cut, the Positive/Anode wire is 3 or 4 millimetres longer
2. When looking at the bottom of the LED, a flat side on the LED case will indicate the Negative/Cathode wire

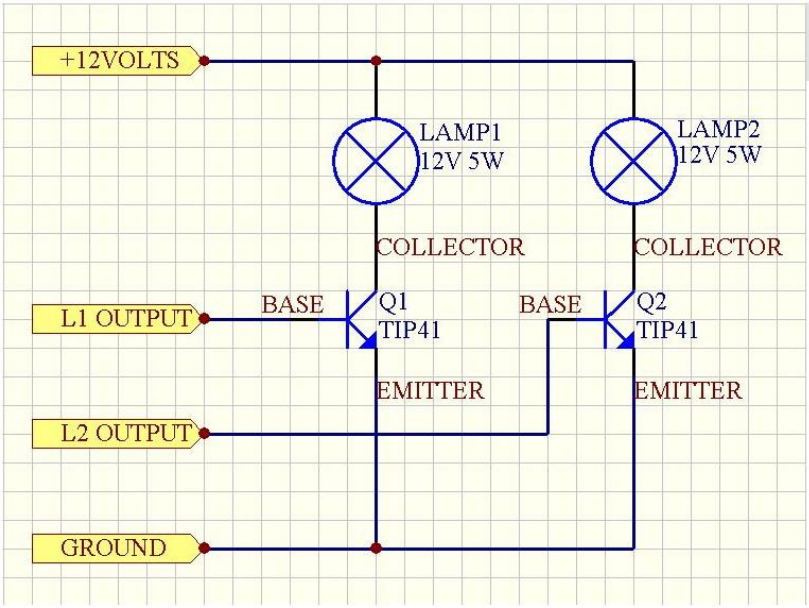


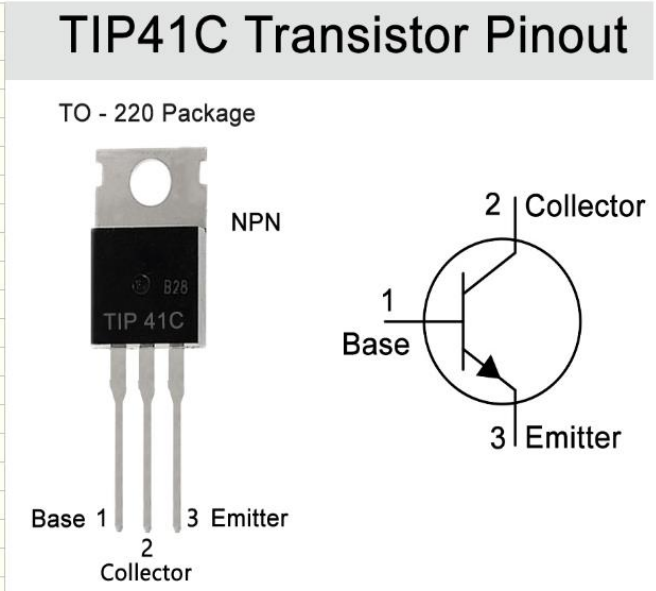
INCREASING THE OUTPUT CAPABILITY

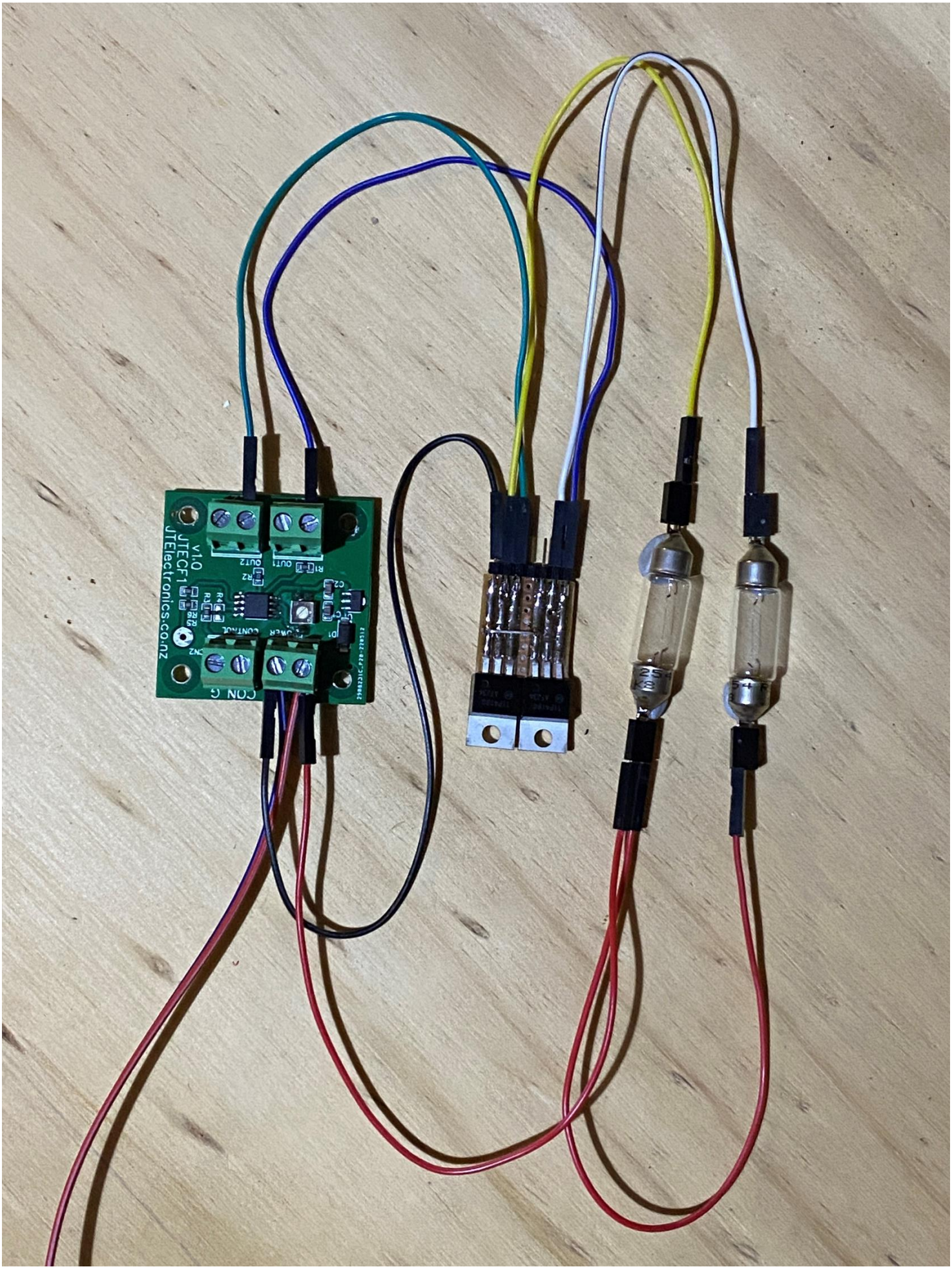
The JTECF1 module can only power one LED on each of the L1+ and L2+ outputs, at about 20 milliamps. To increase the output capability, you could connect a relay board (eg. Jaycar XC4440) or use two NPN transistors to switch more power. We prefer the NPN transistor option as it's cheaper than relay boards and the transistors don't make an annoying click/clack/click/clack noise as they operate like relays will do. The transistors will switch the "ground" power supply connection so LED's must be wired in "Common Anode" configuration which is connected to the positive power supply connection. In either case, you must ensure there is a current limiting resistor in series with the LED's to limit the current. The resistor value will depend on the supply voltage and how many LED's are connected in series. There are many online LED resistor calculators – this one also shows series and parallel LED connection calculations:
https://www.hebeiltd.com.cn/?p=zz.led.resistor.calculator

Below are pictures of the schematic wiring diagram and a test setup using two NPN transistors to turn on two 12 volt 5 watt lamps, which is about 400 milliamps current. The "base" connection of the transistors is connected to the L1+ and L2+ outputs of the JTECF1 flasher unit. The "emitter" connection of both transistors is connected to the power supply "ground" connection. The "collector" connection of the transistors is connected to a lamp. The other lamp connection is connected to common 12V power.

The transistors can be any general purpose NPN transistors rated at 20 volts or greater, and 1 amp or greater. In my test setup I have used transistor type TIP41 (eg. Jaycar ZT2291).






JTECF1
v1.0
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MULTIPLE LED OUTPUT CAPABILITY

The JTECF1 module can only power one LED on each of the L1 and L2 outputs, at about 20 milliamps. To increase the output capability, you could connect a relay board (eg. Jaycar XC4440) or use two NPN transistors to switch more current. The circuit below shows three LED's connected to each output with about 20milliamps current through each LED and you could easily increase this to 10 or 20 LED's per output (each with their own current limiting resistor) so long as your 12volt power source can provide the required current of 20milliamps per LED. A 12volt 500milliamp power supply will be sufficient for connecting up to 25 LEDs per output…