

PWM - Dimmer

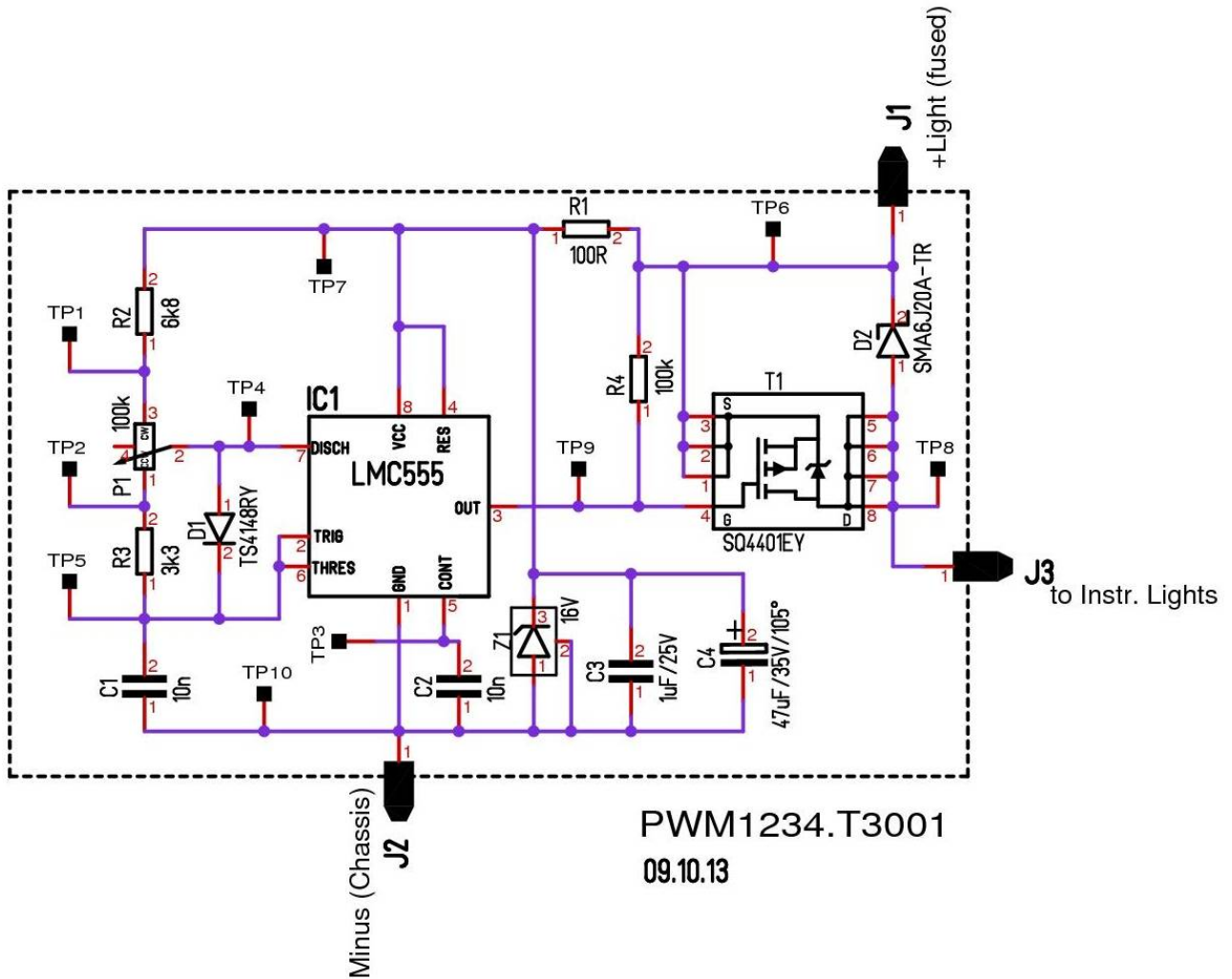
Details

This circuit can also dim LED illumination (in contrast to rheostats) and replace the rheostat used in most older cars to dim incandescents in dash instruments.

This circuit has been developed using TARGET CAD for Schematic and Layout. A PCB (Printed Circuit Board) has been fabricated and some dimmers have been used in different cars to dim Instruments or interior lights. There are still a couple of bare PCBs of earlier version (C4 solder on top of C3) around.

A bill of material (BOM) is available on request, giving all devices and a suppliers.

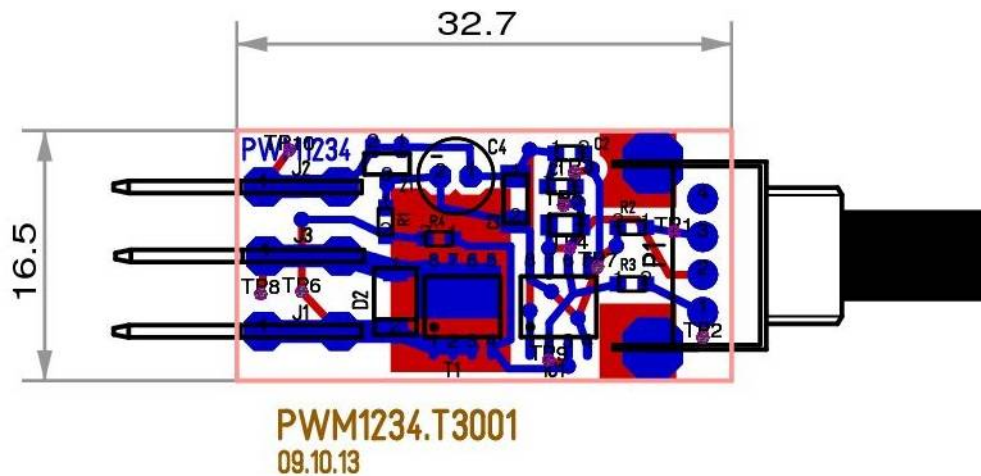
Schematic



A Timer 555 (IC1) is used to produce the PWM signal amplified by the MOSFET (T1). The ON/OFF ratio is set by potentiometer P1. Only an additional connection (J2) to ground is needed to replace the rheostat.

PWM - Dimmer

Layout



The PCB is built using SMD (Surface Mounted Devices) to minimise dimensions. It can be assembled using a small soldering iron by anyone with skills for such type of work. To isolate the circuit a (transparent) shrinking tube around the PCB can be used, leaving just the connector blades (6.3mm) unisolated. The device can be mounted in place of the rheostat using a special nut for the existing hole in the dash. A drawing (DXF) for this nut also exists.

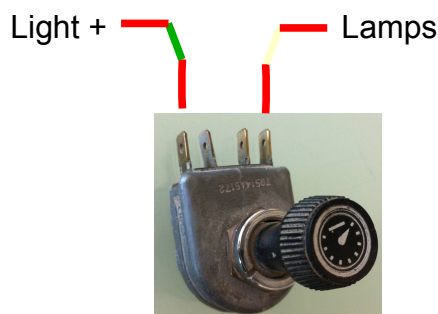
How to use

This PWM-Dimmer can replace the Rheostat (Lucas 78405; MG Part No. BHA4278). It can be used in all cars having negative Earth. The dimming effect is not done by a variable resistor as in rheostats, but by using a Pulse-Width-Modulation (PWM) and can therefore also be used to dim Light Emitting Diodes (LED).

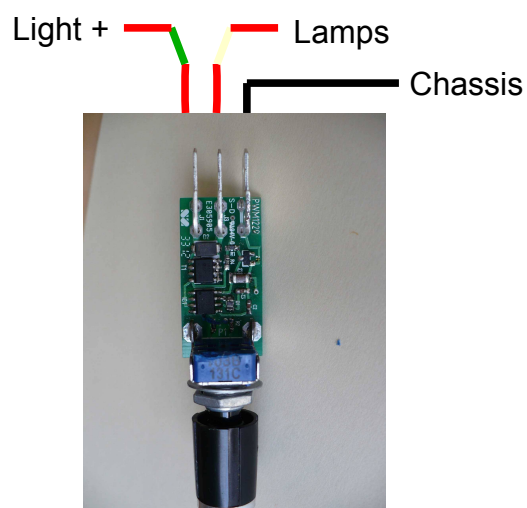
Two of the 3 connections are the same as the 2 connections (RG -- RW) of the rheostat. A third connection is necessary and has to be connected to Chassis Ground.

Using a special Adapter Nut, this dimmer can be fixed in the mounting hole of the rheostat (hole diameter 14 mm). The new dimmer has a M9x0.75 thread.

Old Rheostat



New PWM - Dimmer



PWM - Dimmer

How to remove the Rheostat

Remove knob by pushing in a small spring loaded pin at the side (you can see it in the picture above) and pull the knob out. The round chrome nut can be removed using pliers or something similar. Take off the two Faston Connectors.

Installing the new PWM Dimmer

Prepare the (black) chassis Ground wire and connect it to the dimmer. But back the 2 wires as shown in the picture above. Screw in the dimmer using the special adapter nut and fasten the unit to the dashboard. Put on the new knob. Connect the (black) wire to some chassis Ground.

Technical Details of PWM-Dimmer

Connections	Faston 6.3x0.8 mm
Working Voltage	10 - 15.3 V
Total Lamp Current	max. 4 A (eq. to 48 W)
Setting range	approx. 5 - 95 %
Fixing	Thread M9x0.75 (5mm long)
Knob	plugged (D-axle)
Dimensions	21x19x43 mm (HxWxD over the connectors)

This dimmer is protected against short overvoltage and currents up to 12A.

A fuse (2A) is recommended in the Light + Line (would be a good idea also for rheostats!)

Photo

showing
PCB, Special Nut, Knob

