

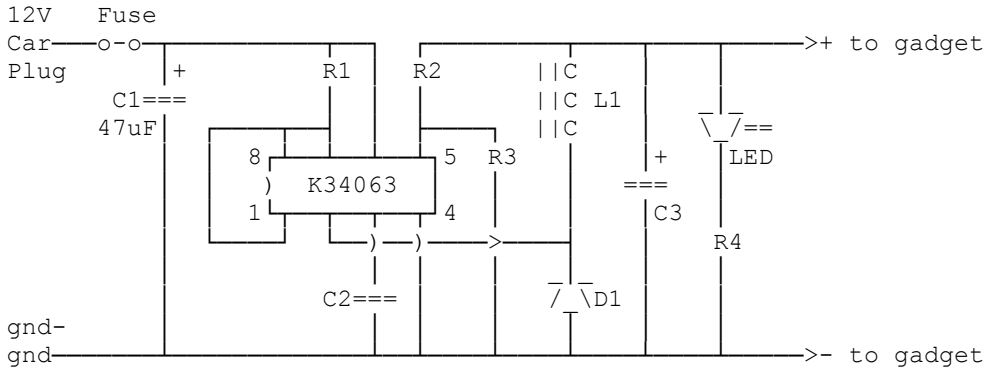
12V Switch Mode Adaptors

By G8MNY

(Update Jan 08)

12V adapters for your Walkman, Mobile Phone, PDA, GPS, Digital Camera etc. are often based on the many versions of the 1.5A 34063 8 pin DIL switch mode regulator IC in this circuit using several PCB layouts in different sized plugs adaptors.

I have seen what happened to a GPS (not mine) when the 12V to 5V adaptor failed! There was no worthwhile fusing/zener to protected the kit & hence the whole thing is a right off, after the GPS internal 3.3V regulator then failed (overheated), fusing the CPU to a short circuit with 12V!

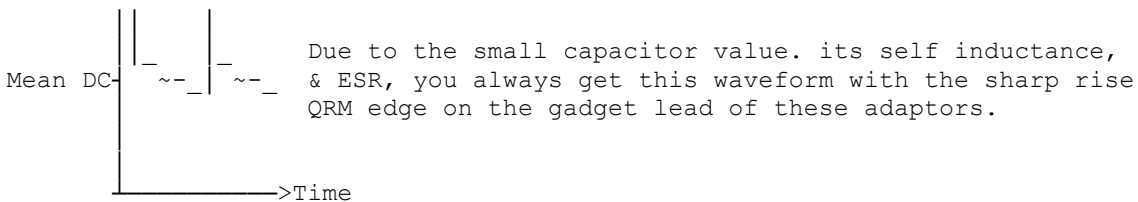


Typical values

	R	C	D	Fuse	IC PIN	Function
1	1 - 4.7R	47uF	1N4001	2A	178	Current drain & sense-
2	1 - 4k7	n47 - 1n			2	Switched Output
3	560 - 1k	4u7 - 220u			3	Osc Timing C
4	330 - 1k				4	Ground
					5	Voltage NFB
					6	Current limit +ref

R2/3 sets the output voltage.  
R1 sets the switching current limit.

Output cap C3 has ripple on it due to pulse currents. These give this sort of spiky ripple..

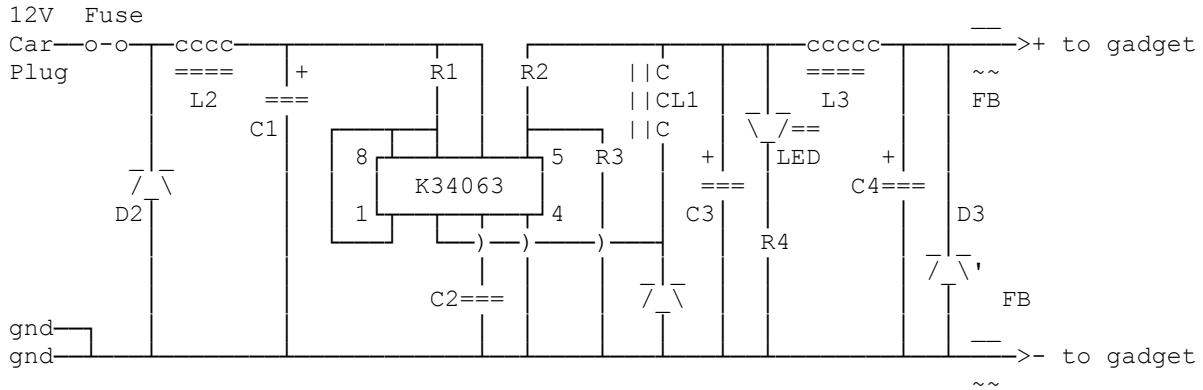


Problems with this simple circuit are:-

- 1/ No output over voltage protection. (important on costly gadgets!)
- 2/ No input idiot diode.
- 3/ High output ripple & QRM?
- 4/ High input ripple & QRM?
- 5/ Direct QRM magnetic radiation from L1 if bobbin type.
- 6/ Too high a fuse rating?
- 7/ Only 1 ground spring connected in car plug earth.

IMPROVEMENTS

If you have space in the plug, try some of these embellishments...



Typical values

No.	R	C	D	L	Fuse
1	1 - 4R7	47uF	1N4001		1A
2	1 - 4k7	n47 - 1n	1N4001	5 turns	
3	560 - 1k	220uF	Zener	3 turns	
4	560 - 1k	100uF			

MODS

- 1/ Add an output zener just a bit higher than the no load voltage.
- 2/ Add input idiot & back EMF diode D2.
- 3a/ Add series L3 of a few turns on a 6mm ferrite bead feeding new C4.
- 3b/ Add ferrite beads on both output leads.
- 4/ Add series input L2, several turns on a 6mm ferrite bead.
- 5/ If L1 is bobbin, try a ferrite ring and listen to MW QRM for comparison.
- 6/ Change the fuse to one just higher than the maximum drain.
- 7/ Tin & wire up the 2nd plug earth spring.

After you have done these mods, & carefully put it back together, tested it (not on your gadget at first!). If it is working OK, you should find the adaptor is much safer than before on your precious gadget. And any nearby QRM is much reduced, as is the possibility of malfunction, in an RFI environment.

Why don't U send an interesting bul?