

Parts List

This parts list is not meant to be a no-brainer shopping list, rather a suggestion and an assistance respectively. Refer to the column description when choosing parts. For some parts there is quite some choice. Depending on picked parts total cost can rise significantly with only negligible performance improvement. Parts cost stated in this parts list is taken from the average to lower cost parts to give an idea how much money you have to spend at least (aprox. \$100).

ID	QTY	description	Mouser.com	Digikey.com	\$/ea.	\$/sum
	1	pcb			9,00	9,00
x-form	1	power transformer, chassis mount, dual secondaries 2x 18V, at least 2x 350mA, (15VA or 25VA) toroidal preferable	546-185C36	TE62044-ND TE62054-ND TE62064-ND	16,00	16,00
C42, C43	2	47nF, LS 7.5mm, at least 35VAC polypropylene film or polyester film or ceramic	140-PF2D473K	BC1707-ND	0,25	0,50
C1 - C8	8	47nF, LS 5.0 or 7.5mm, at least 50VDC polypropylene film or polyester film or ceramic	505-MKS2.047/63/10 505-MKP20.047/100/5	BC2068-ND BC1630-ND	0,25	2,00
C9 - C16	8	330nF, LS 5.0mm, at least 50VDC polypropylene film or polyester film or ceramic	505-MKS2.33/63/10 505-MKP20.33/100/5	P4569-ND	0,09	0,72
D1 - D8	8	Rectifier, TO-220 or DO-41, Schottky or soft recovery MBR1045 / MBR1060 / 10TQ035 / 10TQ040 HFA08TB60 / RHRP860 / 11DQ06	821-MBR1045 512-MBR1045 821-MBR1060	MBR1060GOS-ND HFA08TB60-ND 10TQ035-ND 10TQ040-ND	0,80	6,40
C17 - C20 C23, C24, C29, C30	8	2200uF / 35V, low ESR, LS 7.5mm, max diam=16mm	647-UHE1V222MHD	P10309-ND	1,80	14,40
C25, C28	2	470uF / 35V ... 1000uF / 35V ... 2200uF / 35V low ESR, LS 7.5mm, max diam=16mm	647-UHE1V222MHD 647-UHE1V102MHD	P10309-ND P10305-ND	1,00	2,00
C21, C22	2	22uF...47uF / 35V electrolytic alternatively 10uF...22uF / 35V Tantalum LS 2.5mm, max diam=6mm	647-UUD1V470MCL 647-UPM1V470MEH	P11232-ND	0,35	0,70
C31, C32, C36, C37	4	10uF / 35V Tantalum, LS 2.5mm	74-173D35V10	399-1360-ND 478-1842-ND	1,50	6,00

C44, C45	2	1uF / 35V Tantalum, LS 2.5mm	74-173D35V1.0	399-1429-ND 399-1354-ND 478-1835-ND	0,50	1,00
C33, C34, C38, C39	4	100nF ceramic, at least 35VDC, LS 5.08mm	80-C322C104K5R	399-2081-ND 399-2074-ND	0,10	0,40
C35, C40 C27, C41	4	10nF ceramic multilayer, C0G or X7R at least 50VDC, LS 5.08mm	80-C317C103K5R	399-2075-ND 399-2063-ND 478-2462-N	0,10	0,40
IC1, IC2	2	OPA544T (TO220 5-lead)	n.a.	OPA544T-ND	11,40	22,80
IC3, IC4	2	LM317T / LM317AT (alternatively LM338 / LT338)	511-LM317T 512-LM317T	LM317AT-ND	1,00	2,00
D9 - D12	4	1N4001 ... 1N4004	512-1N4004	1N4004DICT-ND	0,20	0,80
R18, R19	2	cermet trimpot 500R, 3/8" (10mm) W-series, top adjustment	594-64W501 652-3299P-1-501	CT94W501	1,50	3,00
IC5	1	REF102	n.a.	REF102AP-ND REF102BP-ND	4,00	4,00
for IC5	1	dip-8 socket (optional but recommended)	535-08-3518-10 575-193308	ED3308-ND ED56083-ND	0,30	0,30
R1, R2	2	resistor, metal oxide, 2W, 5%, 10R	282-10-RC	P10W-2BK-ND 10W-2-ND	0,30	0,60
R3 - R10	8	resistor, 1/4W, 1%, 50R		49.9XBK-ND	0,10	0,80
R21, R22	2	resistor, 1/4W, 1%, 1R			0,10	0,20
R11, R13	2	resistor, 1/4W, 1%, 120R			0,10	0,20
R12, R14	2	resistor, 1/4W, 1%, 1k8			0,10	0,20
R15, R16, R17	3	resistor, 1/4W, 1% or 0.1%, 10k		10.0KXBK-ND	0,10	0,30
R20	1	resistor, 1/4W, 1% or 0.1% 6k34 for +-16.3V output (6k04 / 6k19 / 6k20) 4k99 for +-15.0V = 30V output 3k50 for +-13.5V = 27V output 2k00 for +-12.0V = 24V output			0,10	0,10
KK1 - KK4	4	heatsink SK129	532-529802B25	HS188	1,30	5,20
L1, L2	2	small choke coil / inductor, 1uH, axial rated for at least 300mA	542-5300-01 542-70F-106	M7813-ND DN2520-ND	0,60	1,20
		connector - terminal block				

	1	3pos LS 5.08mm, pcb mount (optional)	651-1729131	277-1248-ND	1,00	1,00
	4	sink pad TO-220 insulating (optional)				
	1	IEC power inlet module with integrated fuse holder	693-6200.4315	Q206	3,00	3,00
	4	nylon shoulder washer / bushing TO-220 (M3 / #6) (optional)			0,10	0,40
misc.		fuse 5x20mm slow blow screws, standoffs hookup wire ...				

Note 1: output voltage

- determined by R20: $U_{out} = 10 * (1 + (R_{20}/R_{15})) V$
- fine tuning
- R15 / R16 / R17 / R20 ... precision, thermal drift

Note 2: current rating

- inductor on the output path / OPA544 / LM317
- voltage drop across LM317 / OPA544 * current draw = dissipated heat
- dissipated heat * 4K/W (heatsinks) = temp rise of hs above ambient temp
- ...