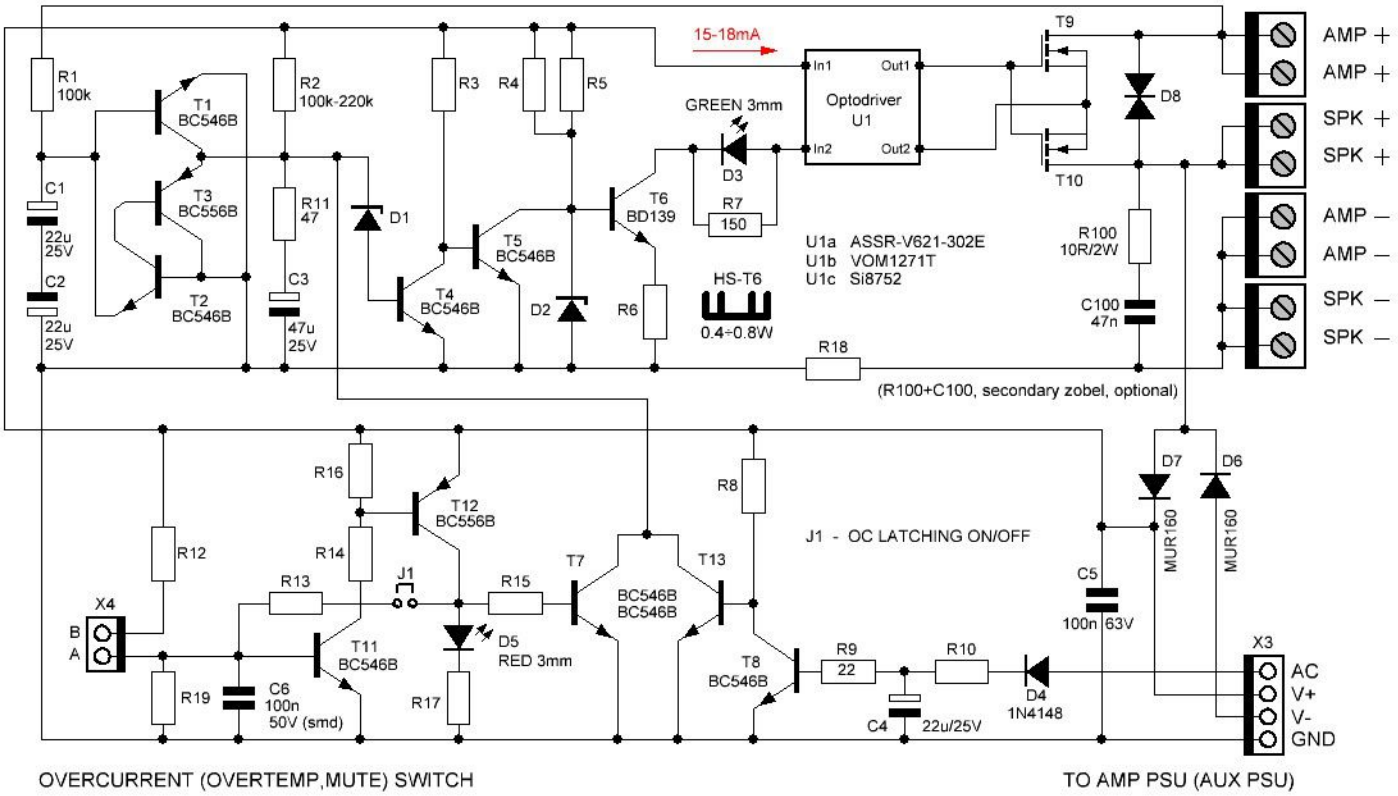
SSR Loudspeaker Protection

FOR POWERAMP 100-300W/4R

schematic v3.0

SENSORS	:	DC,AC,OC
DC SENSING THRESHOLDS	:	+0.6V and -0.6V
ON DELAY	:	ca 2s (adjusted by R2)
DC REACTION TIME	:	1.1s@1V, 15ms@50V
AC REACTION TIME (OFF)	:	< 35ms
OC REACTION TIME	:	< 200us
U1 TURN-ON DELAY	:	< 4ms
U1 TURN-OFF DELAY	:	< 200us
MOSFET TURN-ON TIME	:	< 1ms
MOSFET TURN-OFF TIME	:	< 1us



OVERCURRENT (OVERTEMP,MUTE) SWITCH

TO AMP PSU (AUX PSU)

OPTION 1: POWERED BY POWERAMP DUAL-MONO PSU
POWERED BY POWERAMP SINGLE PSU

GND	0 V
V-	-35 ÷ -60 VDC
V+	+35 ÷ +60 VDC
AC	25 ÷ 43 VAC

DO NOT POPULATE:	R18
R3,8,12-15	47k
R4,5	33k
R6	330
R10,17	22k
R16,19	1k5
C1-C4	Elyt 5mm
D1	BZX55C10
D2	BZX55C5V6
D8	TVS BIPOLAR 68V (P6KE68CA)
HS-T6	HS-130-25 (tme.eu)
HS-T6	ASSMAN V6560W (digikey.com)
T9,T10	TO220 N-Channel 100V 3-5mR
All resistor MF	0.6W 0207

OPTION 2: POWERED BY SINGLE AUX PSU (both channels)

GND	0 V
V-	not used
V+	+12 ÷ +24 VDC
AC	9 ÷ 18 VAC

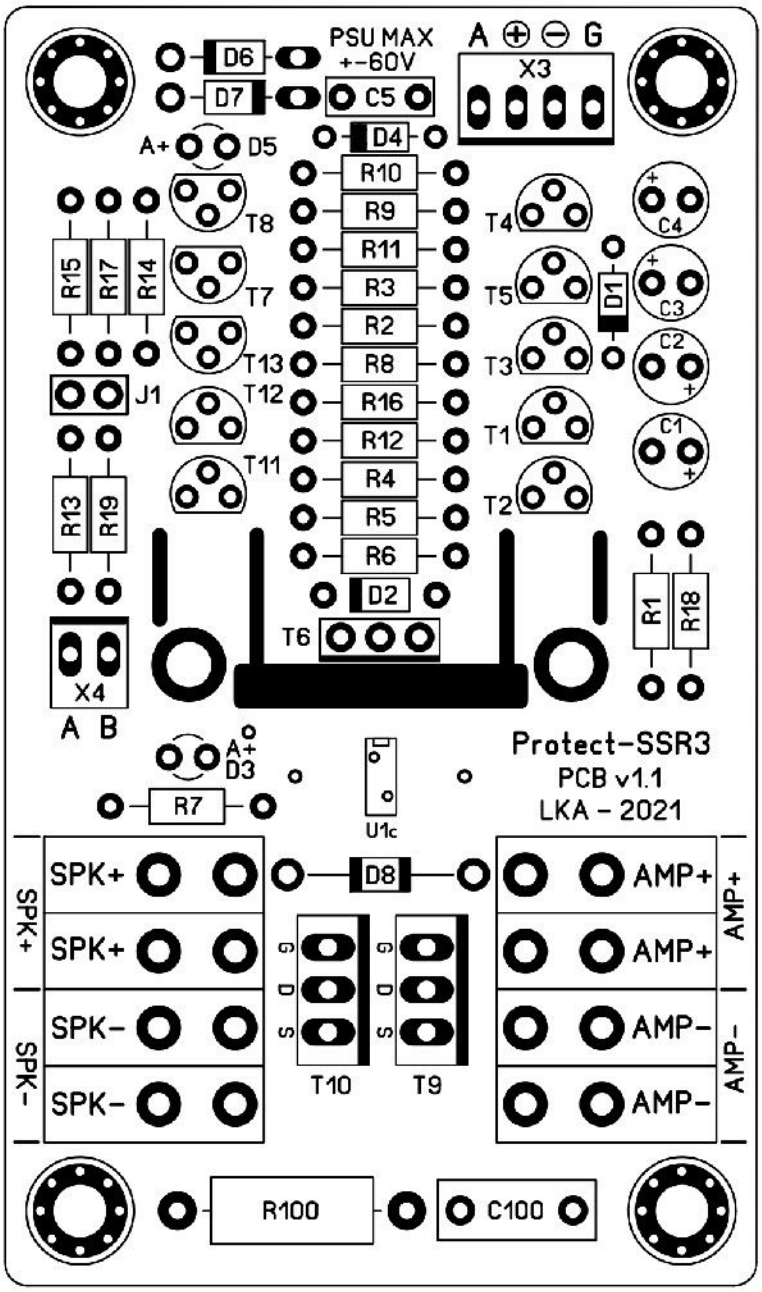
DO NOT POPULATE:	D6,D7 WARNING, DO NOT USE
R3,8,12-15	15k
R4,5	10k
R6	150
R10,17	4k7
R16,18,19	1k
C1-C4	Elyt 5mm
D1	BZX55C4V7
D2	BZX55C3V3
D8	TVS BIPOLAR 68V (P6KE68CA)
HS-T6	optional, HS-130-25 (tme.eu)
HS-T6	optional, V6560W (digikey.com)
T9,T10	TO220 N-Channel 100V 3-5mR
All resistor MF	0.6W 0207

Designed by LKA, 2021, e2000apc@gmail.com

SSR Loudspeaker Protection

FOR POWERAMP 100-300W/4R

PCB version 1.1
Size 50 x 85 mm
Mounting holes M3, 40 x 75 mm



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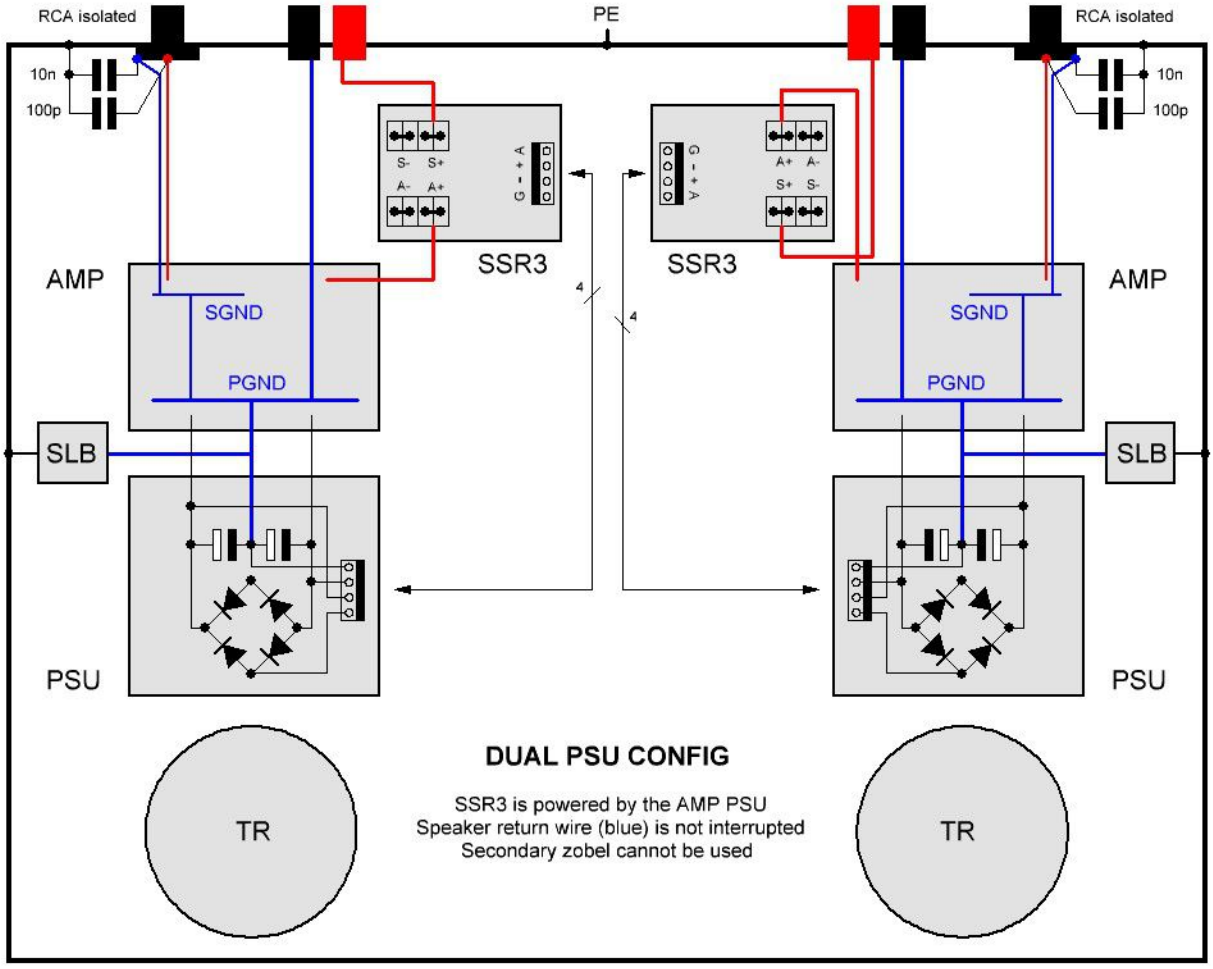

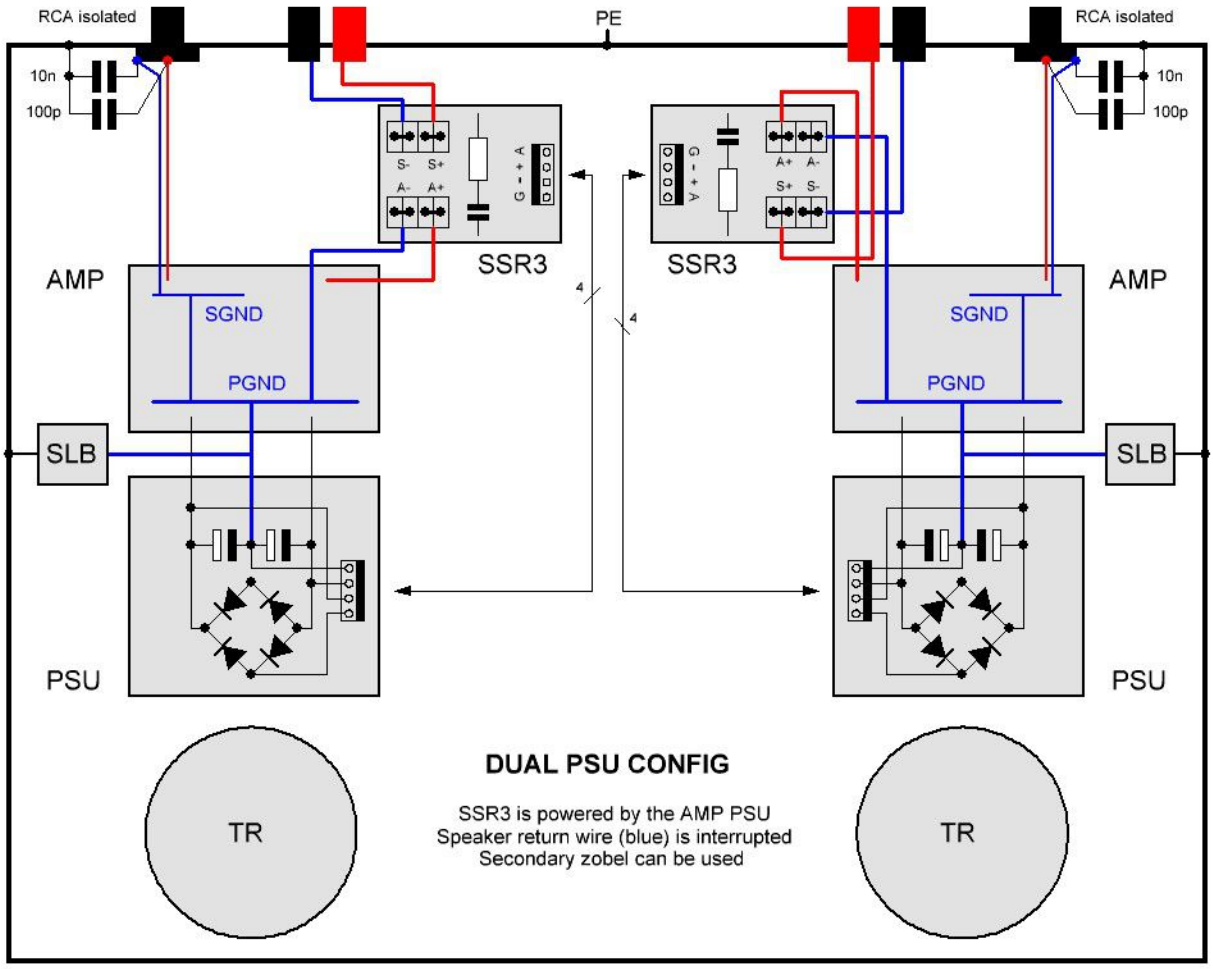

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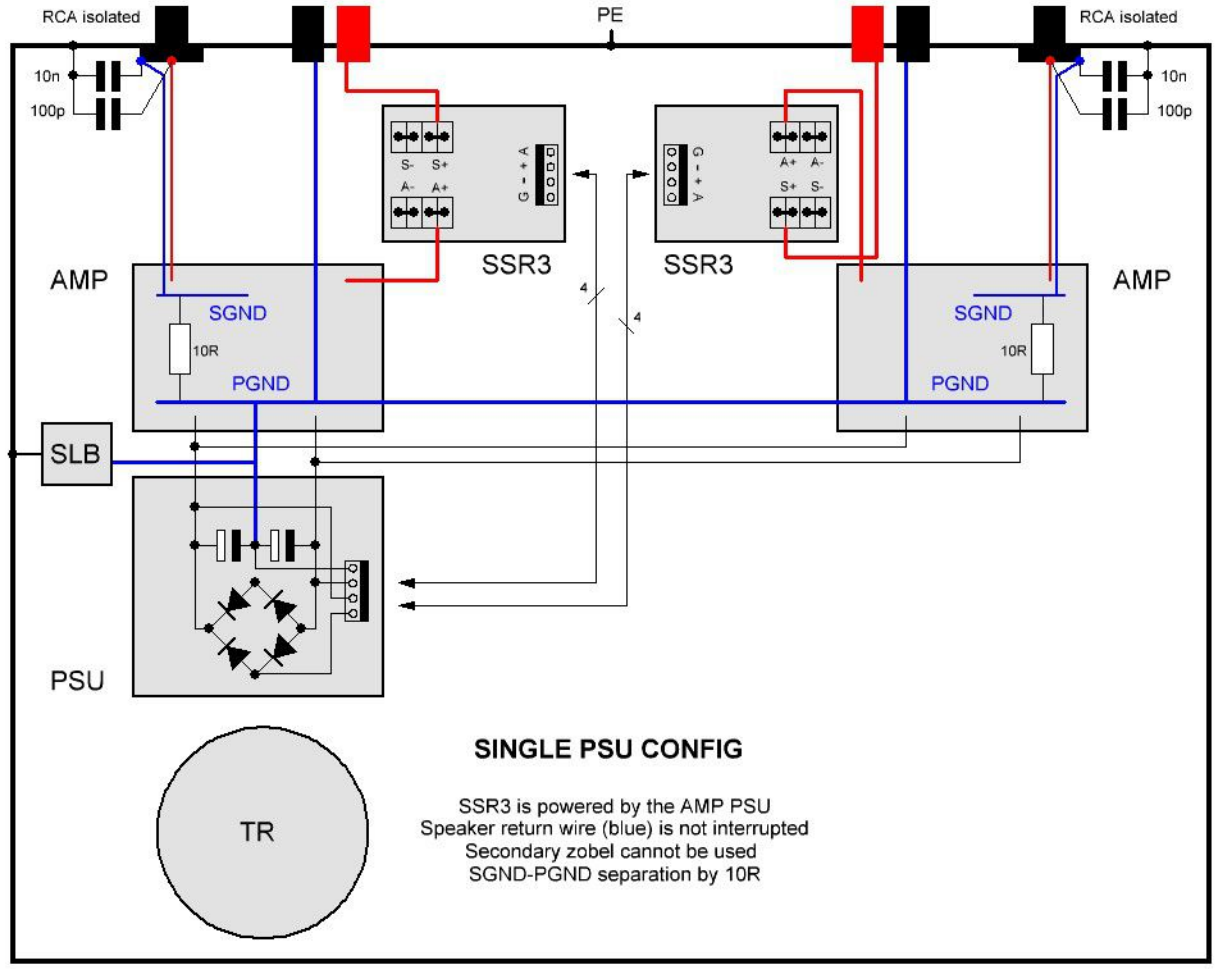

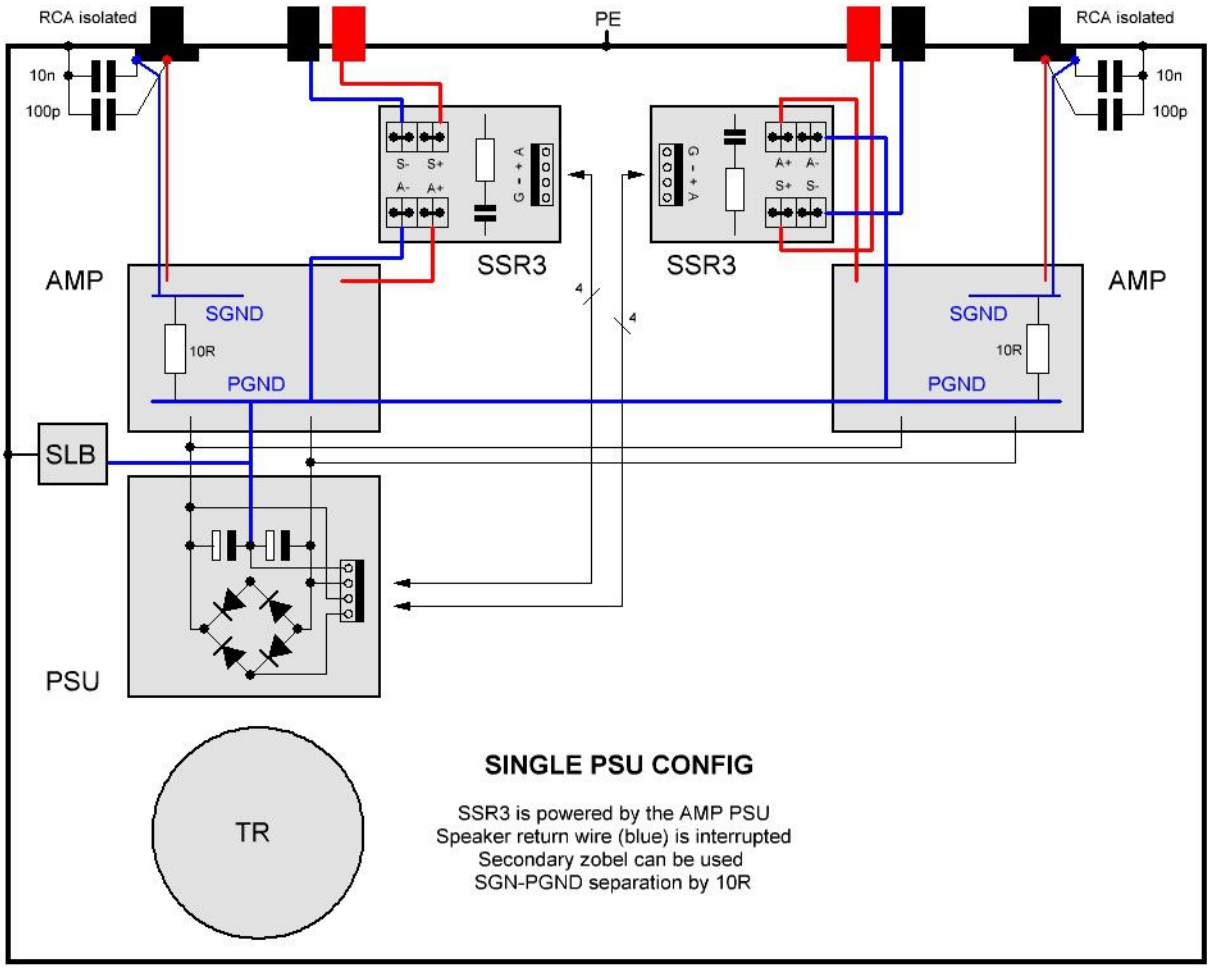

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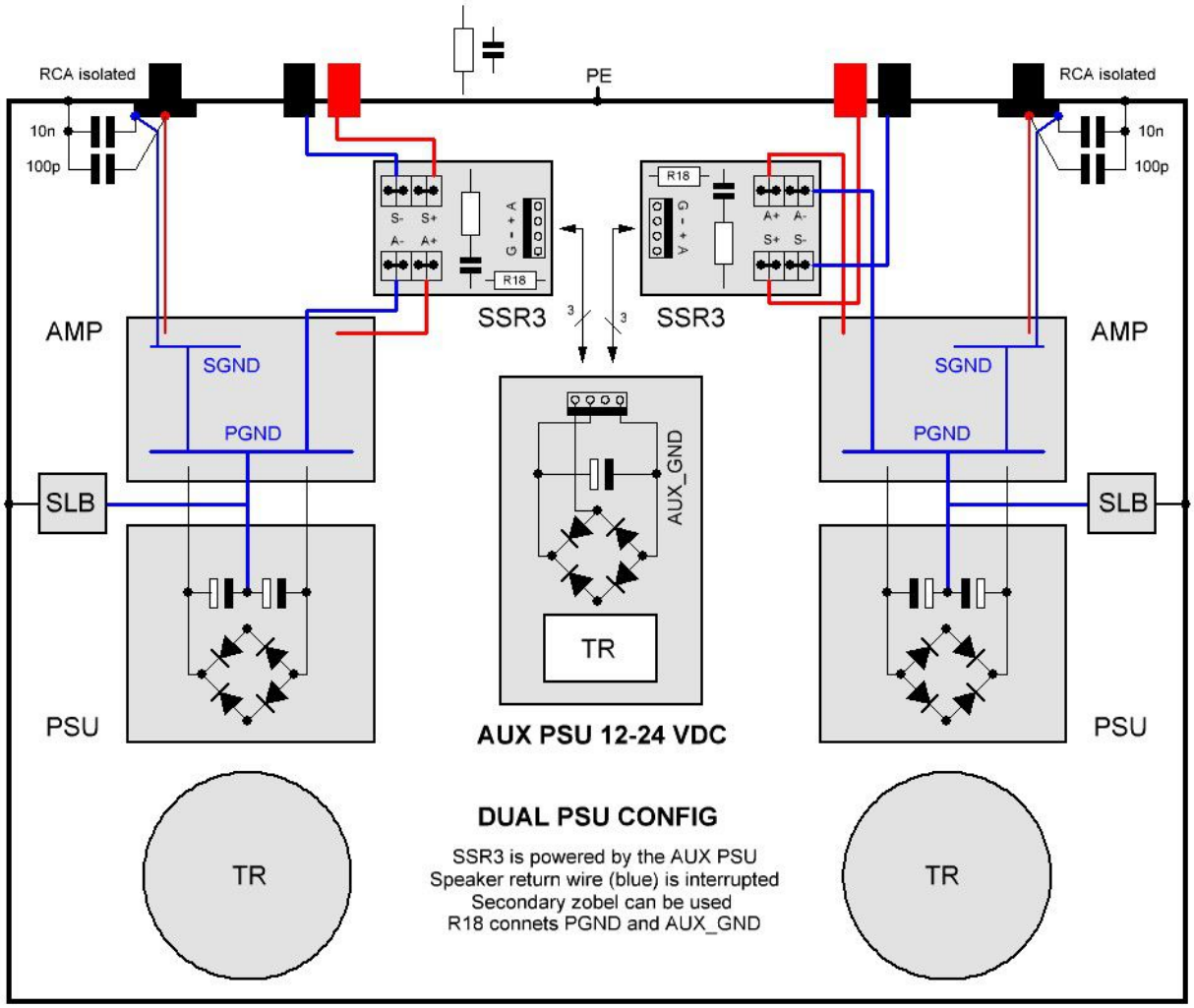

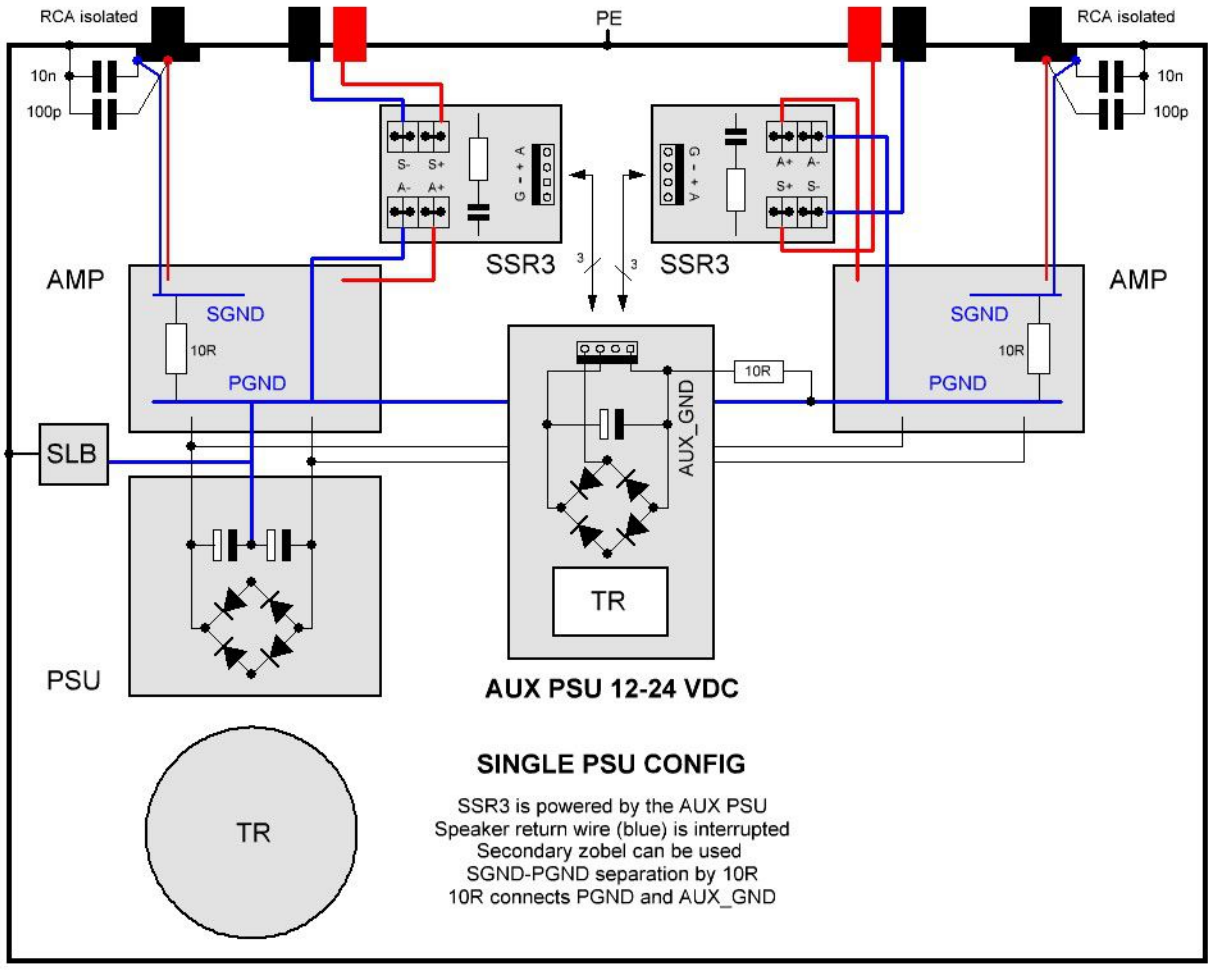

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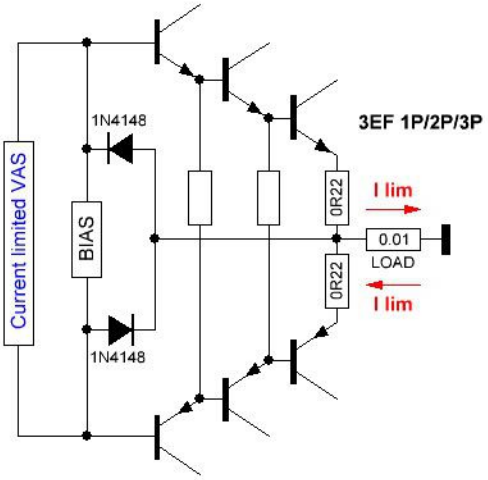
SSR Loudspeaker Protection

Overcurrent protection settings

The overcurrent protection is not intended to replace SOA protection.
The main purpose is to limit the current when a short occurs.

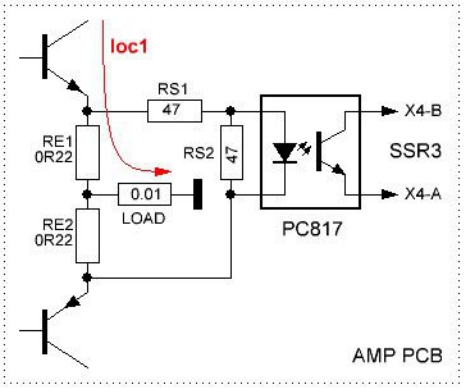


Natural Current Limiter

Number of output pairs vs emitter resistor value

	1P	2P	3P
0R1	16Ap	32Ap	48Ap
0R15	13Ap	25Ap	37Ap
0R22	10Ap	20Ap	30Ap

100W/4R (5Arms, 7Ap) **Ioc = Ioc1 = 10Ap**



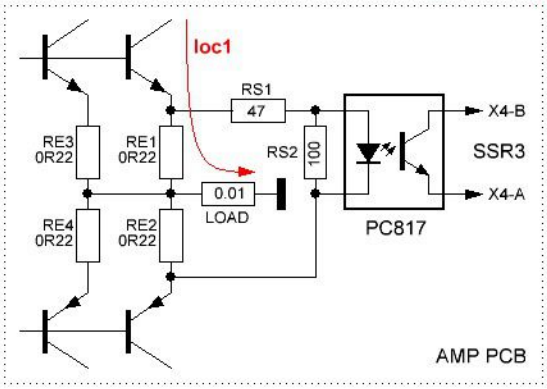
PC817 forward voltage If = 1.1V

Ioc1 = (If / RE1) * ((RS1 + RS2) / RS1)

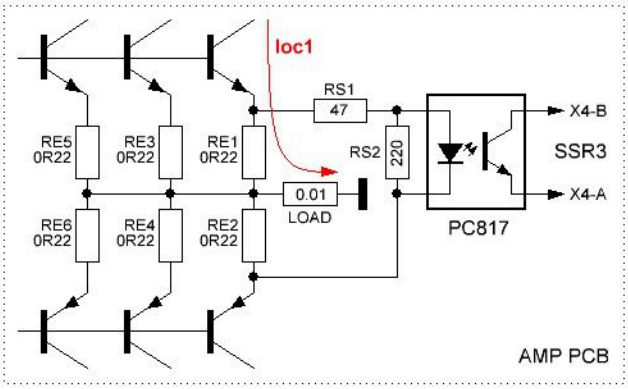
Ioc1 = (1.1 / 0.22) * ((47 + 47) / 47) = 10Ap

Notes:
- The input impedance of the PC817 varies with current.
  (1mA-1Kohm;10mA-100R;20mA-56R)
- The impedance of RS2 is reduced by this parallel impedance,
  so the actual Ioc1 will be higher.
- The best way to determine RS2 is to measure the real amplifier's Ioc

200W/4R (7Arms, 10Ap) **Ioc = 2 * Ioc1 = 15Ap**



300W/4R (8.7Arms, 12.3Ap) **Ioc = 3 * Ioc1 = 20Ap**



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