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JBL

GT01004

4 CHANNEL POWER AMPLIFIER

SERVICE MANUAL



JBL Consumer Products
250 Crossways Park Dr.
Woodbury, New York 11797

Rev1 1/2008

Released 2007
Discontinued XXXX

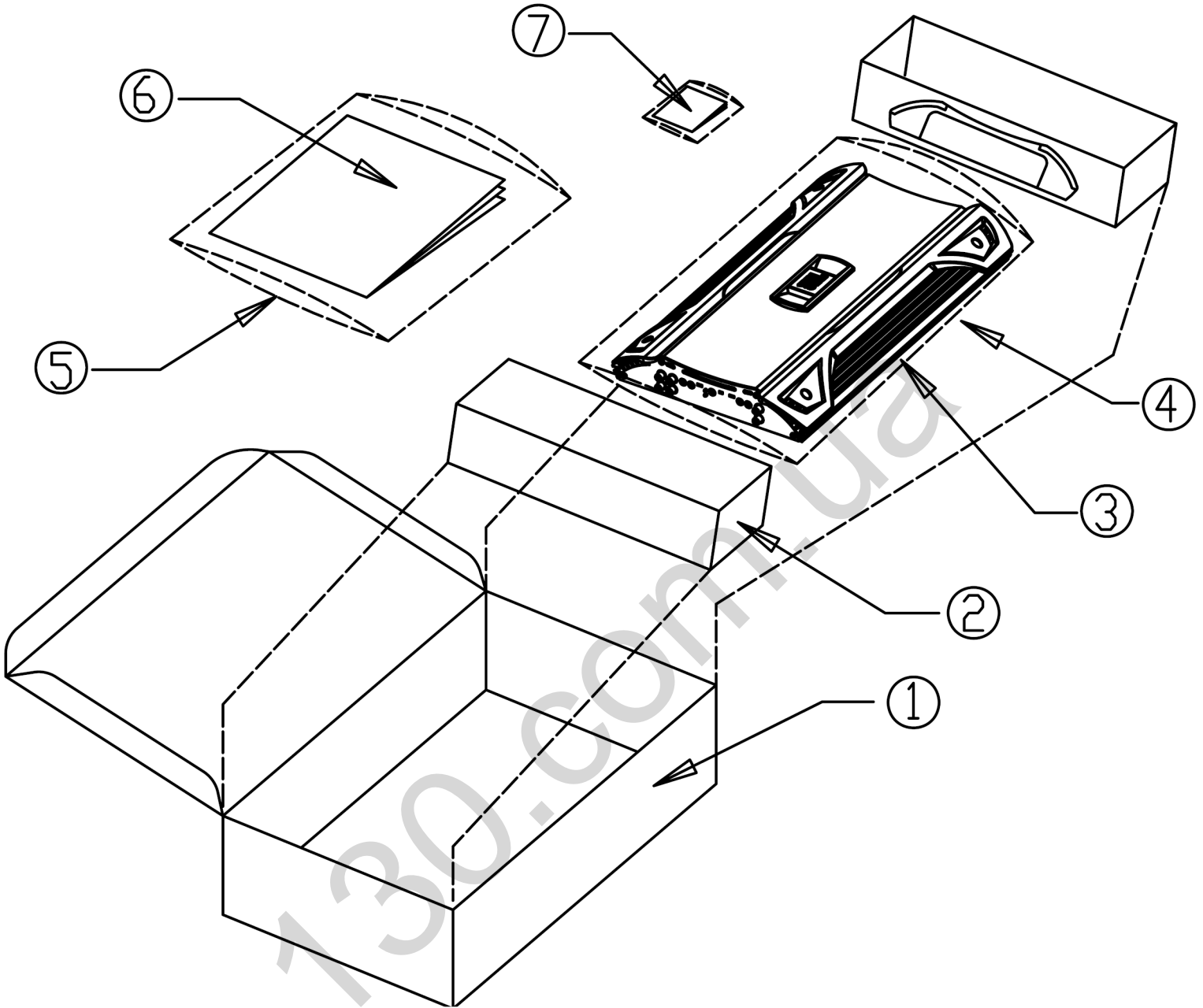
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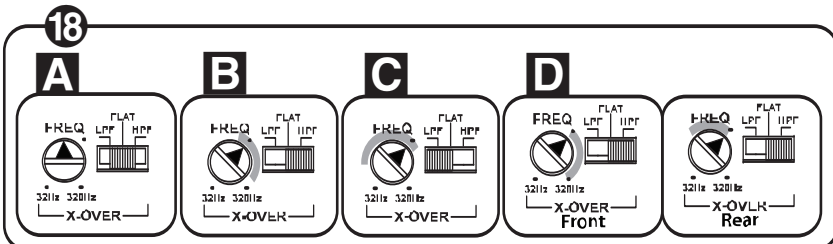
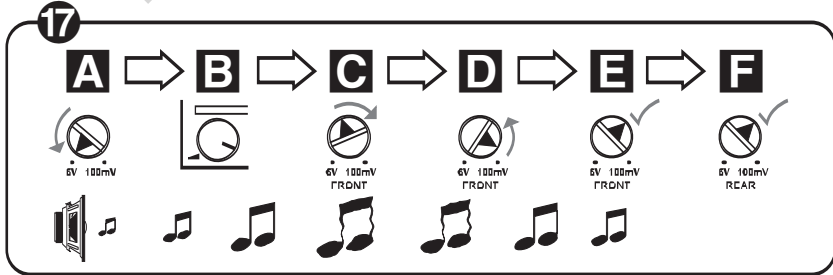
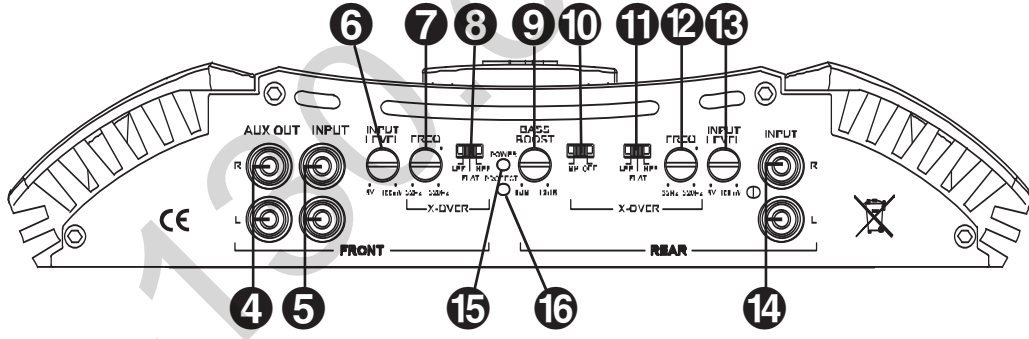
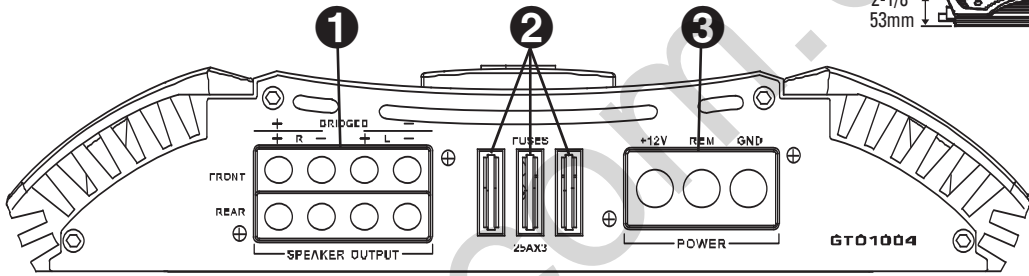
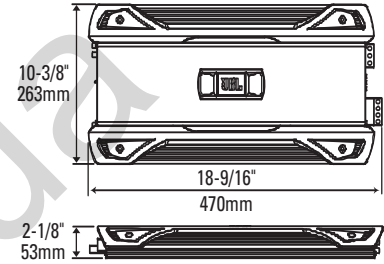
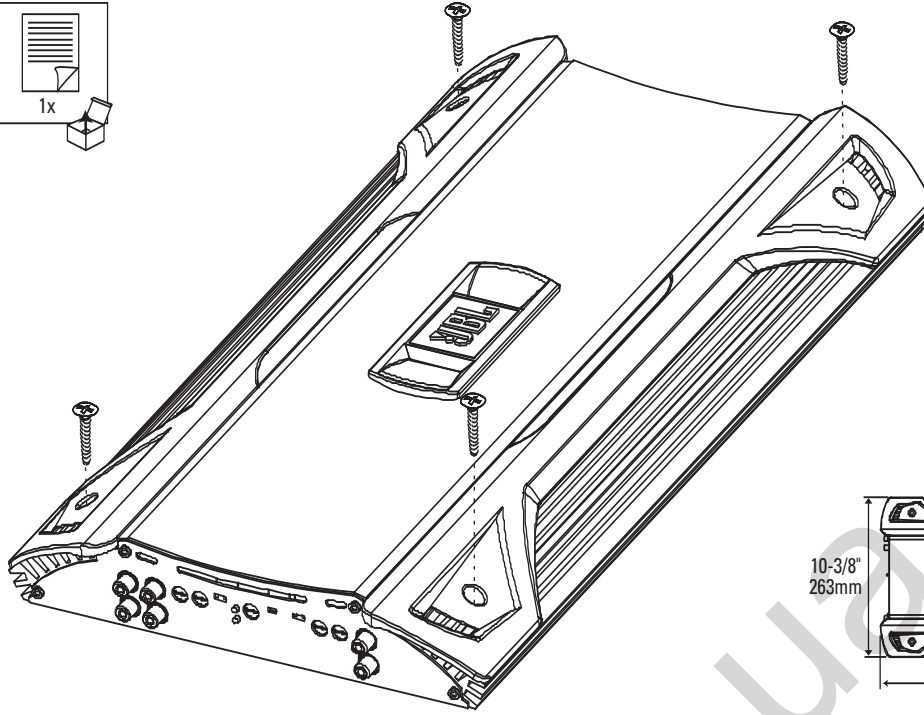
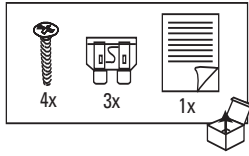
GTO 1004 Specifications

Output Power:	100W RMS x 4 channels @ 4 ohms; ≤1% THD + N
(14.4V supply)	150W RMS x 4 channels @ 2 ohms; ≤1% THD + N
	320W RMS x 2 channel (bridged) @ 4 ohms; ≤1% THD + N
Signal-to-noise ratio:	85dBA (reference 1W into 4 ohms)
	104dBA (reference rated power into 4 ohms)
Dynamic power:	180W @ 2 ohms
Frequency response:	10Hz – 100kHz (–3dB)
THD+N 1KHz LPF=22KHz	≤0.05% (rated power @ 4 ohms)
Channel Separation	≥45db (full rated power)
Input Impedance	>20K ohms
Maximum input signal:	6.0V
Maximum sensitivity:	100mV
Hi-Pass, Low Pass X-over Limits	32Hz – 320Hz ±20%
Bass Boost @ 50Hz	0-12dB
DC Offset	<30mV
Output regulation:	.03dB @ 4 ohms
Idle Current @ 4 ohms	1.5A
Max Current Draw	<70A @ 2 ohms both channels driven
Remote Operating Voltages	ON 5V OFF 4V
Turn-on delay time	2-3 sec
Circuit Protection	Temperature (85±5C), Short circuit,
Operating voltage range	(8-16V)
Dimensions:	18 9/16 x 10 3/8 x 2 1/8" (470 x 263 x 53mm)
Fuses:	(3) x 25A

JBL continually strives to update and improve existing products, as well as create new ones. The specifications and details in this and related JBL publications are therefore subject to change without notice.



Item	Part Number	Description	Qty
1	CH5523221132	Outer Carton	1
2	BZL311105120	Packing Foam	2
3	GTO1004	Amplifier	1
4		Plastic bag	1
5		Plastic bag	1
6	Visit www.jbl.com	Owner's manual	1
7		Accessory kit consisting of:	
	LS1AA0404501	Mounting Screws	4
	1601-253G-00	25A Fuse	3



GTO1004 CAR AUDIO POWER AMPLIFIER OWNER'S MANUAL

Installation Warnings and Tips

- Disconnect the negative (-) lead from your vehicle's battery.
- At the installation sites, locate and make a note of all fuel lines, hydraulic brake lines, vacuum lines and electrical wiring. Use extreme caution when cutting or drilling in and around these areas.
- Choose a safe mounting location away from moisture.
- Make sure there is sufficient air circulation at the mounting location for the amplifier to cool itself.
- Mount the amplifier, using the supplied hardware.

Specifications

- 100W RMS x 4 channels @ 4 ohms and ≤1% THD + N*
- 150W RMS x 4 channels @ 2 ohms and ≤1% THD + N*
- THD + N: 0.05% (rated power @ 4 ohms)
- Signal-to-noise ratio: 85dB (reference 1W into 4 ohms)*
- Signal-to-noise ratio: 104dB (reference rated power into 4 ohms)
- Frequency response: 10Hz – 100kHz (-3dB)
- Max power: 600 watts
- * CEA-2006A-compliant

1 Speaker Output Connectors

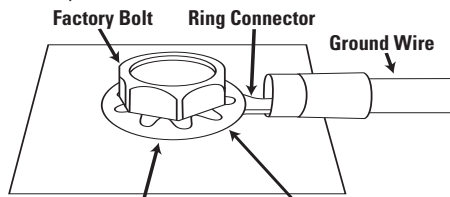
- Connect the speakers to these terminals, observing proper polarity.
 - Four-channel operation: Connect the front left speaker to the Front L+ and L- terminals, and the front right speaker to the Front R+ and R- terminals. Repeat for the rear speakers, using the Rear L+ and L- terminals, and the Rear R+ and R- terminals.
 - Three-channel operation: Connect the stereo speakers to the Front terminals, as above. Connect the single speaker into which the amplifier's rear channels will be bridged to the Rear R+ and Rear L- terminals.
 - Two-channel (bridged) operation: Connect one speaker to the Front R+ and Front L- terminals. Connect the other speaker to the Rear R+ and Rear L- terminals.
- Minimum speaker impedance for stereo operation is 2 ohms. Minimum speaker impedance for bridged operation is 4 ohms.

2 Fuses

- Replace only with the same type and rating.

3 Power Input Connectors

- +12V: Connect to the positive terminal of the vehicle's battery. 8 AWG wire is recommended. Install an appropriate fuse holder and fuse (75A minimum) within 18 inches of the battery. Make sure the wire is not damaged or pinched during installation. Install protective grommets when routing wires through the firewall or other sheet metal.
- GND: Connect to the vehicle's chassis. Refer to the picture below.



Note: Remove any paint below ring connector.

- REM: Connect to the "Remote Out" lead from the source unit or to a source of switched 12V+ (ACC).

4 Aux Output Connectors (RCA)

- Summed, nonfiltered pass-through output. Front right and rear right inputs are combined and sent to the right AUX output. Front left and rear left inputs are combined and sent to the left AUX output. Connect to the input of an additional subwoofer amplifier.

5 Front Input Connectors (RCA)

- Connect to the front RCA outputs from the source unit or signal processor.

6 Front Input-Level Control

- Used to match the front input level of the amplifier to the output level of the source unit.
- See 17 for the adjustment procedure.

7 Front Crossover-Frequency Control

- 12dB/octave crossover, variable from 32Hz to 320Hz.
- See 18 for the adjustment procedure.

8 Front Crossover-Filter Selector

- LPF: Select for subwoofer(s).
- FLAT: Select for full-range speakers when no subwoofer will be used in the system.
- HPF: Select for midrange speakers or full-range speakers when a subwoofer is used in the system.

9 Rear Bass-Boost Control

- Set the Bass-Boost control according to your preference, being careful not to apply enough boost to damage your speaker(s).

10 Rear Band-Pass (BP) Switch

- If you will use the rear channels to drive a pair of separate mid-bass speakers, place this switch in the BP position. The front crossover frequency control will set the low-pass filter frequency and the rear crossover control will set the high-pass frequency. In BP mode, the rear crossover filter switch has no effect. Only the front inputs should be used in BP mode.

11 Rear Crossover-Filter Selector

- LPF: Select for subwoofer(s).
- FLAT: Select for full-range speakers when no subwoofer will be used in the system.
- HPF: Select for midrange speakers or full-range speakers when a subwoofer is used in the system.

12 Rear Crossover-Frequency Control

- 12dB/octave crossover, variable from 32Hz to 320Hz.
- See the adjustment procedure in 18.

13 Rear Input-Level Control

- Used to match the input level of the amplifier to the output level of the source unit. See 17 for the adjustment procedure.
- Also used to adjust the level of the mid-bass speakers when the BP switch is in the BP position.

14 Rear Input Connectors (RCA)

- Connect to the rear RCA outputs from the source unit, or signal processor. Not used when the BP switch is in the BP position.

15 Power On LED

- Illuminated when the amplifier is on.

16 Protect LED

- Illuminated under any of the following fault conditions: battery over/under voltage, short circuit in speaker wires, amplifier is too hot, amplifier's output circuit has failed (DC voltage is present in the amplifier's output).

17 Setting Input Level

- Turn all Input-Level controls counterclockwise to 6V (minimum).
- With a dynamic music track playing, turn the head unit's volume control to the 3/4 position.
- Turn Front Input-Level control clockwise until the music is so loud that it no longer sounds clear (distortion is present in the output).
- Turn Front-Input-Level control counterclockwise gradually, just until the music sounds clear, once again.
- Front-Level input is now adjusted correctly.
- Adjust Rear Input-Level control so that the level of the rear speakers is proportionate to the level of the front speakers, according to your preference.

18 Setting the Crossover

- Crossover setting for 5" or larger full-range speakers when no subwoofer is included in the system.
- Crossover setting for full-range speakers when a subwoofer is included in the system.
- Crossover setting for subwoofers.
- Crossover setting for systems that include separate mid-bass speakers driven by the rear channels with the BP switch set to "BP."

Note: Acceptable frequency ranges are indicated in gray.

This product is designed for mobile applications and is not intended for connection to the mains. A valid serial number is required for warranty coverage. Features, specifications and appearance are subject to change without notice.

Amplifier Troubleshooting Guide

1. Status LED on Amplifier not Lit - Head Unit (Source) Turned ON

Verify:

- A. Remote turn-on wire from source to amplifier has proper voltage
- B. Power (B+) connections at amplifier, terminal blocks, and battery are secure
- C. Ground (GND) connections at amplifier and vehicle chassis are secure
- D. Battery B+ fuse (if used) is OK
- E. Amplifier fuse is OK
- F. B+ at battery and B+ at amplifier has proper voltage

2. Status LED's Lit, No Output from Speakers in Normal Operating Condition

Verify:

- A. RCA cables from amplifier to source are securely connected
- B. Volume adjustment on amplifier is correctly adjusted
- C. Source is ON and playing

3. Engine Noise From Speaker(s)

Turn source OFF, Disconnect RCA cables at amplifier. If noise stops, check equipment & cables leading to amplifier.

Verify:

- A. RCA cables are of good quality with no breakage to internal shields
- B. RCA cables from source to amplifier are not run alongside any power cables

4. Amplifier Output Distorted Music

Verify:

- A. Source output music to amplifier is not distorted
- B. Source output sensitivity is correctly adjusted

5. Amplifier Shuts Down, Green LED's are Lit - Amplifier is in Thermal Protection Mode

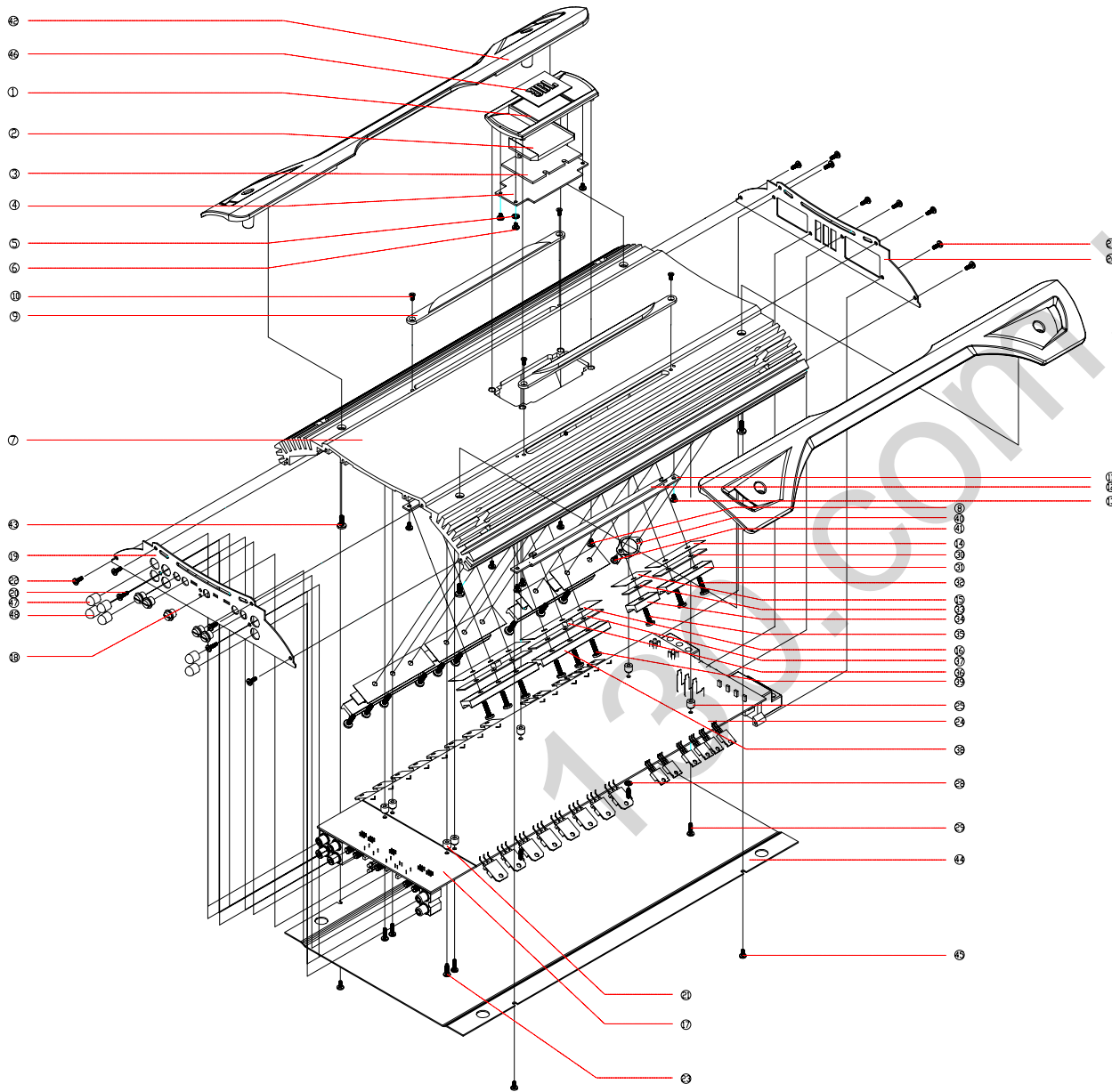
Verify:

- A. Amplifier is mounted with adequate air circulation around heatsinks or vents
- B. Amplifier is not mounted under carpet or sealed enclosure
- C. Speakers meet correct impedance for application (mono or stereo hookup)

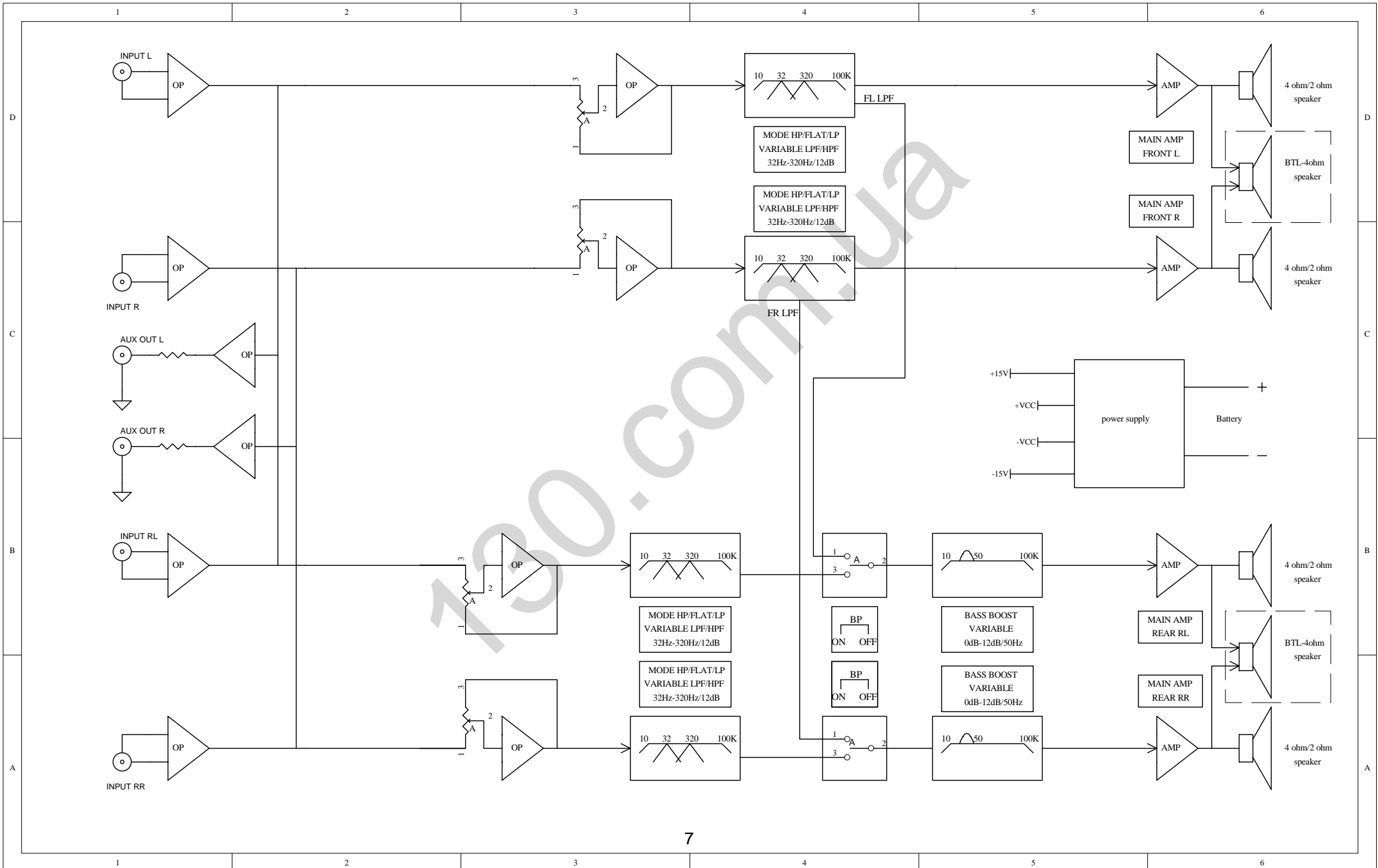
6. Amplifier Does Not Turn ON, and Red LED is Lit Amplifier (and not Connected to a Shorted Speaker)

Verify:

- A. Speaker crossover (if used) is not defective



No.	item	Part Number	Qty	No.	item	Part Number	Qty
①	Top plate	ZS-D00010112	1	⑳	Screw BT3*8	LS1JT0300801	8
②	Reflector board	GD-500012400	1	㉑	Washer	DQ8069032084	1
③	Reflector board#2	GD-600030003	1	㉒	Screw BT3*12	LS1JT0301201	5
④	PCB		1	㉓	Insulated paper	JY460A12A10X	2
⑤	Washer	DQ8069032084	1	㉔	Trans. Clamp	PL-A0044-000	2
⑥	Screw BM3*4	LS1JM0300401	4	㉕	Screw BM4*14	LS1JM0401401	4
⑦	Heatsink	SR-1004-0124	1	㉖	Insulated paper	JY430A10A10X	2
⑧	Screw BM3*5	LS1JM0300501	4	㉗	Trans. Clamp	PL-A0002-000	2
⑨	Light bar	PL-A0048-000	2	㉘	Screw BM4*14	LS1JM0401401	2
⑩	Screw KT3*6	LS1FP0300011	4	㉙	EVA	JD-A02180515	4
⑪	Reflector board#1	GD-600040003	2	㉚	Insulated paper	JY488A12A10X	4
⑫	PCB		2	㉛	Trans. Clamp	PL-A0046-000	4
⑬	Screw BM3*5	LS1JM0300501	4	㉜	Screw BM4*14	LS1JM0401401	12
⑭	Mica	JY260A22A01X	2	㉝	Temperature switch	1380-0210-00	1
⑮	Mica	JY233A22A01X	2	㉞	Screw BM3*4	LS1JM0300401	2
⑯	Mica	JY288A22A10X	4	㉟	Side panel	ZS-A00010104	2
⑰	PCB		1	㊱	Screw BM4*10	LS1JM0401001	4
⑱	Knob	XN-10500-012	5	㊲	Bottom plate	XG-0033-0501	1
⑲	Front Plate	MK-0110-0507	1	㊳	Screw BT3*6	LS1JT0300601	4
⑳	Screw BT3*10	LS1JT0301001	2	㊴	Logo plate	MP-0752-3001	1
㉑	Standoff	ZL-10038A-15	2	㊵	RCA CAP (Red)	KT-200021300	3
㉒	Screw BT3*8	LS1JT0300801	4	㊶	RCA CAP (Wht)	KT-200012200	3
㉓	Screw BT3*12	LS1JT0301201	2				
㉔	PCB		1				
㉕	Standoff	ZL-10038A-15	5				
㉖	Rear plate	HG-0027-0507	1				

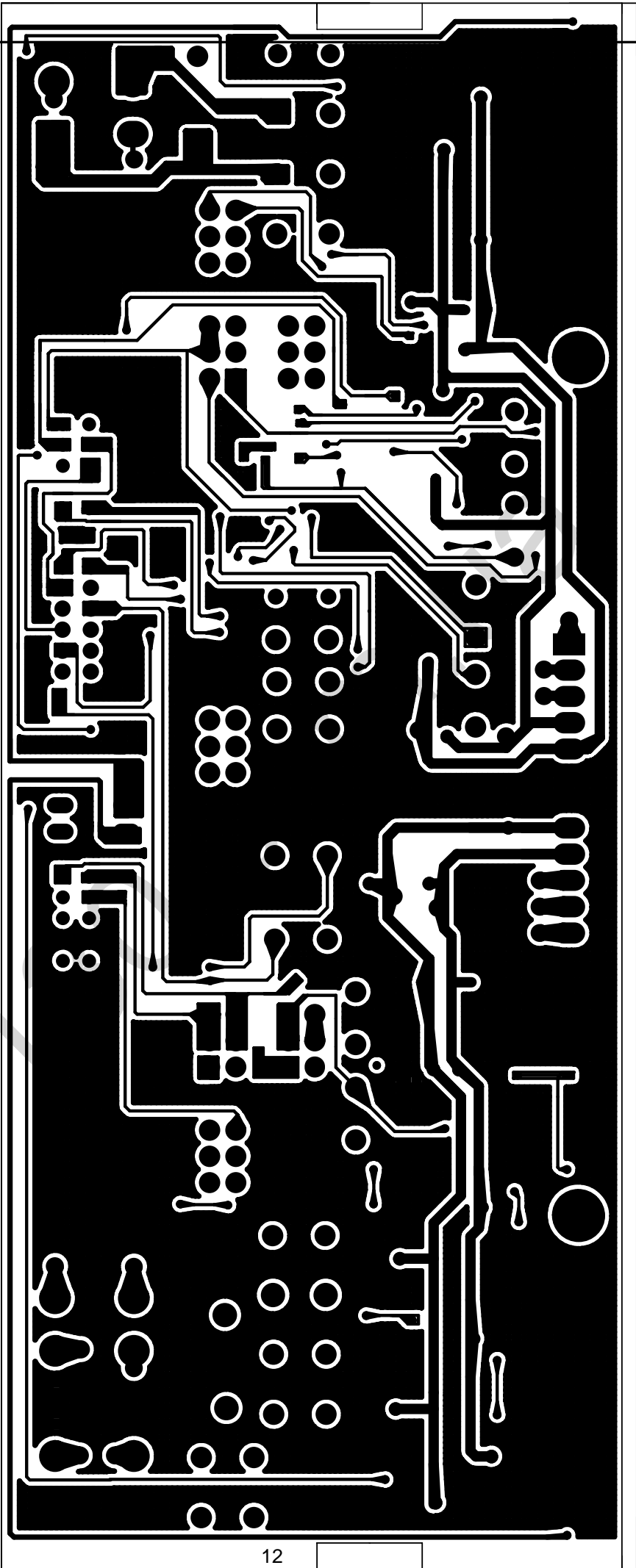


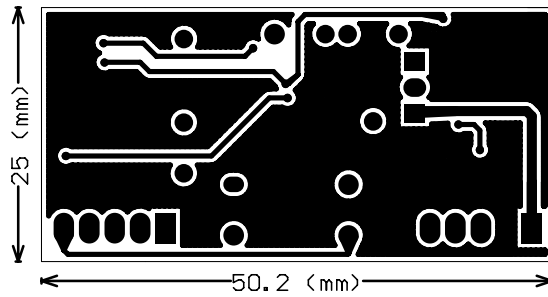
GTO1004 Electrical Parts List					
Part Number	Reference Designator	Qty		Description	
MAIN PCB					
<i>Resistors</i>					
0702-2000-02	JP253 JP252	2	Resistor	1/4W 0Ω ±5%	
0702-2151-02	R22A R22B R22C R22D R38A R38B R38C R38D	8	Resistor	1/4W 150Ω ±5%	
0702-2392-02	R6	1	Resistor	1/4W 3.9KΩ ±5%	
0702-24R7-02	R23A R23B R23C R23D R24A R24B R24C R24D R25A R25B R25C R25D R26A R26B R26C R26D	16	Resistor	1/4W 4.7Ω ±5%	
0702-1821-02	R32D R31D R31A R31B R31C R32A R32B R32C R33A R33B R33C R33D R34A R34B R34C R34D	16	Resistor	1/8W 820Ω ±5%	
0702-3220-02	R24 R25 R12 R13 R14 R15	6	Resistor	1/2W 22Ω ±5%	
0702-34R7-02	R36A R36B R36C R36D	4	Resistor	1/2W 4.7Ω ±5%	
0702-1220-02	R14A R14B R14C R14D R15A R15B R15C R15D R16A R16B R16C R16D R17A R17B R17C R17D	16	Resistor	1/8W 22Ω ±5%	
0703-1470-03	R6A R6B R6C R6D R7A R7B R7C R7D	8	Resistor	1/8W 47Ω ±1%	
0702-1101-02	R20 R21 R22 R23 R16 R17 R18 R19 R13A R13B R13C R13D	12	Resistor	1/8W 100Ω ±5%	
0703-1102-03	R1A R1B R1C R1D R2A R2B R2C R2D R3A R3B R3C R3D R4A R4B R4C R4D R5A R5B R5C R5D	20	Resistor	1/8W 1KΩ ±1%	
0703-1332-03	R20A R20B R20C R20D	4	Resistor	1/8W 3.3KΩ ±1%	
0702-1472-02	R2	1	Resistor	1/8W 4.7KΩ ±5%	
0703-1622-03	R21A R21B R21C R21D	4	Resistor	1/8W 6.2KΩ ±1%	
0702-1562-02	R18A R18B R18C R18D R19A R19B R19C R19D	8	Resistor	1/8W 5.6KΩ ±5%	
0703-1752-03	R37A R37B R37C R37D	5	Resistor	1/8W 7.5KΩ ±1%	
0702-1103-02	R32 R7 R3 R4 R9A R9B R9C R9D R10A R10B R10C R10D R11A R11B R11C R11D R12A R12B R12C R12D R30	21	Resistor	1/8W 10KΩ ±5%	
0702-1473-02	R1 R11 R10 R9 R8 R35D R35C R35B R35A	9	Resistor	1/8W 47KΩ ±5%	
0702-1104-02	R5	1	Resistor	1/8W 100KΩ ±5%	
0708-70R1-02	R27A R27B R27C R27D R28A R28B R28C R28D R29A R29B R29C R29D R30A R30B R30C R30D	16	Resistor	3W 0.1Ω ±5%	
0704-4101-02	R26 R27 R28 R29	4	Resistor	1W 100Ω ±5%	
<i>Capacitors</i>					
06D211056001	C11A C11B C11C C11D	4	CAP,Electro	1UF/50V ±20% 5*11 105C	
06D211074100	C7A C7B C7C C7D C11 C45	6	CAP,Electro	100uF/25V ±20% 6.3*11 105C	
06D213374101	C35 C36 C37 C38	4	CAP,Electro	330UF/25V ±20% 8*14 105C	
06D212266010	C5A C5B C5C C5D C6A C6B C6C C6D C2	9	CAP,Electro	22uF/50V ±20% 5*11 105C	
06D213386001	C31 C32 C33 C34	4	CAP,Electro	3300UF/50V ±20% 25*25 105C	
06D213376117	C27 C28 C29 C30	4	CAP,Electro	330uF/50V ±20% 10*20 105C	
06D214766100	C18 C19 C20 C21	4	CAP,Electro	47uF/50V ±20% 6.3*11 105C	
06D202264109	C1	1	CAP,Electro	22uF/25V ±20% 5*12 105C	
06D211066301	C3A C3B C3C C3D	4	CAP,Electro	10UF/50V ±20% 5*11 105C	
06D212285101	C5 C6 C7 C8	4	CAP,Electro	2200UF/35V Φ16*26MM ±20% 105C	
06D321027200	C16 C17	2	Resistor	102/100V ±5%	
06D321037200	C12 C13 C14 C15	4	Resistor	103/100V ±5%	
06D321047200	C10A C10B C10C C10D C12A C12B C12C C12D	8	Resistor	104/100V ±5%	
06D231017000	C8A C8B C8C C8D C9A C9B C9C C9D	8	Ceramic Cap	100pF/100V ±20%	
06D233917000	C1A C1B C1C C1D C2A C2B C2C C2D	8	Cap	391/100V ±20%	
06D234717001	C4A C4B C4C C4D	4	Ceramic Cap	470PF/100V ±20%	
06D231047000	C9 C22 C44 1C 2C 5C 6C 4C C4 C43	10	Ceramic Cap	0.1uF/100V ±20%	
06D431047000	C3 C39 C40 C41 C42 C23 C24 C25 C26	9	Ceramic Cap	0.1uF/100V +80%/-20%	
06D211076001	8C 9C	2	CAP,Electro	100UF/50V ±20% 8*12 105C	
<i>Semiconductors</i>					
04WY-15BV204	ZD1 ZD2 ZD3 ZD4	4	diode	15V DO-35 1W	

Part Number	Reference Designator	Qty	Description	
MAIN PCB				
04PT-4148-04	D1 D1A D1B D1C D1D D2 D2A D2B D2C D2D D3 D4 D5 D6 D8A D8B D8C D8D	18	diode	1N4148 GSS 200MA 75V DO-35
03N1-5551-01	Q7A Q7B Q7C Q7D Q8A Q8B Q8C Q8D Q10A Q10D Q10C Q10B	12	Transistor	2N5551 NPN TO-92
03P1-5401-01	Q11A Q11B Q11C Q11D Q12A Q12B Q12C Q12D	8	Transistor	2N5401 PNP TO-92
03N1-1815-01	Q2 Q3 Q4 Q5	4	Transistor	2SC1815GR 150MA 60V 400MW NPN TO-92
03N1-669A-07	Q2A Q2B Q2C Q2D	4	Transistor	2SD669A NPN TO-126
03N1-667A-01	Q3A Q3B Q3C Q3D	4	Transistor	2SD667AC 1A 120V 0.9W NPN TO-92
03P1-B647-01	Q1A Q1B Q1C Q1D	4	Transistor	2SB647 1A 120V 0.9W PNP TO-92
03P1-B649-07	Q13A Q13B Q13C Q13D	4	Transistor	2SB649A 1.5A 180V 20W PNP TO-126
03N1-SA13-01	Q9A Q9B Q9C Q9D	4	Transistor	MPSA13 0.5A 30V NPN TO-92
03N1-8050-01	Q6A Q6B Q6C Q6D	4	Transistor	8050D NPN TO-92
03N1-35CW-26	Q4A Q4B Q4C Q4D Q5A Q5B Q5C Q5D	8	Transistor	TIP35CW NPN TO-247
03P1-36CW-26	Q14A Q14B Q14C Q14D Q15A Q15B Q15C Q15D	8	Transistor	TIP36CW PNP TO-247
04GS-C6A4-00	D16	1	diode	MIC6A4
04GS-R104-00	D7 D8 D9 D10 D11 D12 D13 D14 D15	9	diode	FR104 1A 400V 52MM
03D1-50N6-24	Q6 Q7 Q8 Q9 Q10 Q11 Q12 Q13	8	MOS	HFP50N06 TO-220
2202-1602-05	D18 D19	2	Rectifier	UF1602CT AKA 16/200V TO-220
2202-1620-05	D20 D21	2	Rectifier	MUR1620CTA KAD 16A/200V TO-220
<i>Miscellaneous</i>				
1601-253G-00		6	fuse	25A/32V DC
1401-0001-03	F1	1	fuse holder	3PIN model:BXS3-09
3000-BLGT-01	T2 T1	2	Transformer	4:10:06 ϕ 37 L1=L2= ϕ 0.8*10*4TS L3=L4= ϕ 0.8*5*10TS L5=L6= ϕ 0.8*1*6TS
1004-3000-10	L3 L5	2	toroidal inductor	30UH ϕ 12 inner diameter ϕ 5 pitch11.5mm
1005-5R03-10	L1	1	toroidal inductor	5UH ϕ 10*30MM ϕ 2*11.5T
1005-1R00-10	L6	1	toroidal inductor	5UH ϕ 10*30MM ϕ 2*11.5T
24T1-010028B	JP2	1	jump wire	length100MM diameter2.0MM high23MM
1501-0205-00	CN5 CN6	2	socket	Pitch 2.5MM 2PIN
1501-1209-00	CN7	1	socket	Pitch 2.54MM 12PIN
2100-0069-02		1	wire	2PIN UL1007 AWG26 L=35mm 2.54spacing,5mm
1380-0210-00		1	temperature switch	two pitches KSD301 85C
1501-0300-02	CN3	1	terminal	BTS3-24
1505-0800-01	CN4	1	terminal	BTS8-26
PL-A0051-000		2		Alum. Bar with Insulated paper
PL-A0053-000		4		Alum. Bar with Insulated paper
PL-A0049-000		2		Alum. Bar with Insulated paper
PREAMP/INPUT PCB				
<i>Resistors</i>				
0701-2221-03	R105A R112A	2	Resistor	SMD 220 Ω 1/8W \pm 1% 0805
0701-2301-03	R231 R241 R330 R331	4	Resistor	SMD 300 Ω 1/8W \pm 1% 0805
0701-2102-03	R106 R111 R119 R119A R120 R120A R226 R227	8	Resistor	SMD 1K Ω 1/8W \pm 1% 0805
0701-2682-03	R329 R324 R229 R224 R109A R109 R102A R102	8	Resistor	SMD 6.8K Ω 1/8W \pm 1% 0805
0701-2472-03	R310 R306 R230 R210	4	Resistor	SMD 4.7K Ω 1/8W \pm 1% 0805
0701-2562-03	R118A R118 R117A R117 R116A R116 R115A R115	8	Resistor	SMD 5.6K Ω 1/8W \pm 1% 0805

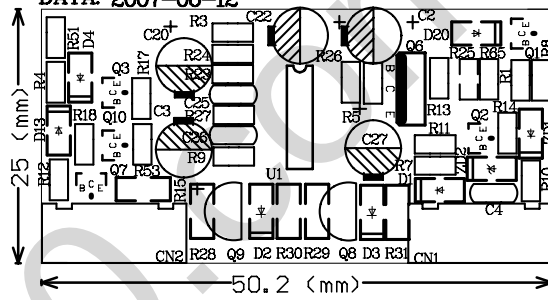
Part Number	Reference Designator	Qty	Description	
PREAMP/INPUT PCB				
0701-2103-03	R316 R315 R314 R313 R312 R311 R309 R308 R307 R305 R303 R302 R300 R211 R209 R208 R207 R205 R203 R202 R200 R125 R124 R114 R113A R113 R112 R110A R110 R108A R108 R107A R107 R105 R104A R104 R103A R103 R101A R101 R100A R100 R127 R128	44	Resistor	SMD 10K 1/8W ±1% 0805
0701-2223-03	R4 R3 R2 R1 R304 R301 R204 R201	8	Resistor	SMD 22KΩ 1/8W ±1% 0805
0701-2563-03	R220 R221 R222 R223 R320 R323	6	Resistor	SMD 56KΩ 1/8W ±1% 0805
0701-2623-03	R106A R114A	2	Resistor	SMD 62KΩ 1/8W ±1% 0805
0701-2104-03	R216 R217	2	Resistor	SMD 100KΩ 1/8W ±1% 0805
1204-2030-01	VR200 VR300	2	potentiometer	B20K KQ L=15 ±10% LEVEL
1204-5031-18	VR100 VR100A	2	potentiometer	A50K R0971G2B W=5 KQ L=15MM T=7.5MM M=1MM FREQ
1204-5021-06	VR101	1	potentiometer	B5K KQ L=15 ±15% BASS BOOST
<i>Capacitors</i>				
06D212274001	C216 C217 C316 C317	4	CAP,Electro	220UF/25V ±20% 8*16 105C
06D212266010	C200 C201 C206 C211 C212 C300 C301 C305 C307 C207	10	CAP,Electro	22uF/50V ±20% 5*11 105C
06D321247000	C107 C130 C106 C131	4	capacitor	124/100V ±5%
06D328237200	C103 C103A C105 C105A C102 C102A C104 C104A	8	capacitor	M/C823/100V ±5%
06S321016000	C218 C219 C220 C221 C222 C225 C318 C319 C320 C321 C322 C325	12	capacitor	SMD 100pF/50V 0805 NPO ±5%
06S321006000	C214 C215 C314 C315 C226 C227 C326 C327	8	capacitor	SMD 10pF/50V 0805 NPO ±5%
06S322206000	C100 C100A C101 C101A C108A C109A C223 C224	8	capacitor	SMD 22pF/50V 0805 NPO ±5%
06S121046000	C1 C2 C3 C4 C5 C6 C7 C8	8	capacitor	SMD 0.1uF/50V 0805 X7R ±10%
<i>Semiconductors</i>				
01JR-4558-08	U200 U201 U202 U300 U301 U302	6	IC	SMD NJM4558 SOP-8 DUAL OP-AMP
01ST-L074-08	U100 U101 U102 U103	4	IC	SMD TL074 SOP-14 QUAD OP-AMP
2000-0017-00	LED1	1	LED	Φ3MM
2004-0014-00	LED100	1	LED	Φ3.0MM
<i>Miscellaneous</i>				
1333-0210-00	SW100 SW100A	2	switch	SK-23D02AK6 SW2P3T LPF/FLAT/HPF
2100-0009-12		1	wire	12PIN UL1007 AWG26 L=45mm 2.54 2.54
1404-0020-04	RCA200	1	socket	AV4-8.4-38
1404-0027-02	RCA300	1	RCA	AV2-8.4-38
1332-0402-00	SW101	1	switch	SK-42D02G6 SW4P2T 2*2*6MM BP
PWM PCB				
<i>Resistors</i>				
0701-2221-03	R17	1	SMD resistor	SMD 220Ω 1/8W ±1% 0805
0701-2102-03	R26	1	SMD resistor	SMD 1KΩ 1/8W ±1% 0805
0701-2302-03	R13	1	SMD resistor	SMD 3KΩ 1/8W ±1% 0805
0701-2472-03	R11	1	SMD resistor	SMD 4.7KΩ 1/8W ±1% 0805
0701-2682-03	R51 R5	2	SMD resistor	SMD 6.8KΩ 1/8W ±1% 0805
0701-2562-03	R14	1	SMD resistor	SMD 5.6KΩ 1/8W ±1% 0805
0701-2103-03	R1 R23	2	SMD resistor	SMD 10K 1/8W ±1% 0805
0701-2113-03	R27	1	SMD resistor	SMD 11KΩ 1/8W ±1% 0805
0701-2123-03	R24	1	SMD resistor	SMD 12KΩ 1/8W ±1% 0805

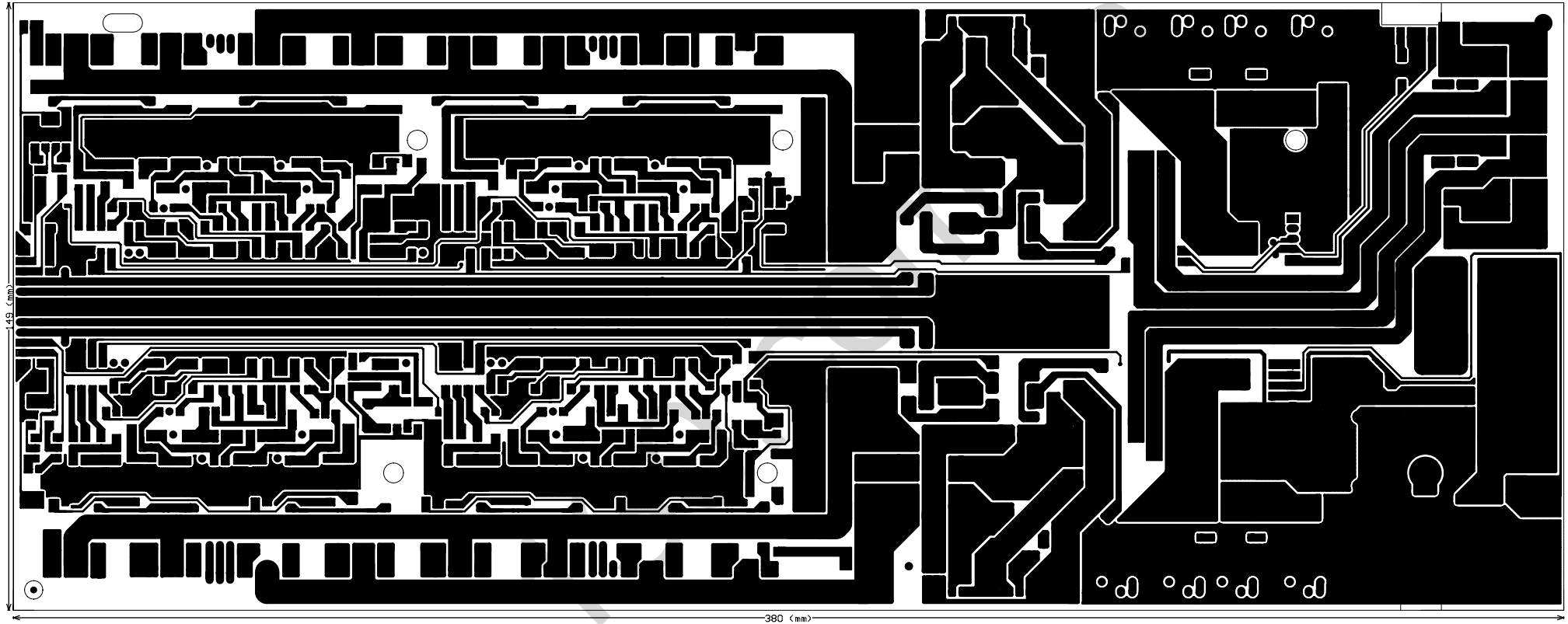
Part Number	Reference Designator	Qty	Description	
PWM PCB				
0701-2153-03	R53	1	SMD resistor	SMD 15KΩ 1/8W ±1% 0805
0701-2183-03	R7	1	SMD resistor	SMD 18KΩ 1/8W ±1% 0805
0701-2223-03	R9 R18	2	SMD resistor	SMD 22KΩ 1/8W ±1% 0805
0701-2101-03	R10	1	SMD resistor	SMD 100Ω 1/8W ±1% 0805
0701-2333-03	R65	1	SMD resistor	SMD 33KΩ 1/8W ±1% 0805
0701-2104-03	R25 R4 R12	3	SMD resistor	SMD 100KΩ 1/8W ±1% 0805
0701-2334-03	R3	1	SMD resistor	SMD 330KΩ 1/8W ±1% 0805
0701-3102-02	R29 R28 R15 R30 R31	5	resistor	SMD 1KΩ 1/4W ±5% 1206
<i>Capacitors</i>				
06D211074100	C27	1	CAP,Electro	100uF/25V ±20% 6.3*11 105C
06D211056001	C3	1	CAP,Electro	1UF/50V ±20% 5*11 105C
06D212273002	C22	1	CAP,Electro	220UF/16V ±20% 6.3*11 105C
06D212266010	C20	1	CAP,Electro	22uF/50V ±20% 5*11 105C
06S321026000	C26	1	SMD capacitor	SMD 1000pF/50V 0805 NPO ±5%
06S121046000	C25 C4	2	SMD capacitor	SMD 0.1uF/50V 0805 X7R ±10%
<i>Semiconductors</i>				
04WY-15BV-01	ZD1	1	diode schottky	SMD 15V 1/2W 5MA range15.7V-16.5V DO-213AA
04WY-39AV101	ZD2	1	diode schottky	SMD 3.9V DO-213AA 0.5W
04PT-4148-01	D13 D20 D1 D4 D2 D3	6	diode	SMD 1N4148 DO-213AA
03P1-1015-04	Q10	1	Transistor	SMD 2SA1015 SOT-23 PNP
03P1-1023-01	Q8 Q9	2	Transistor	A1023 TO-92 PNP
03P1-B649-01	Q6	1	Transistor	2SB649A PNP TO-92
03N1-1815-04	Q1 Q7 Q2 Q3	4	Transistor	SMD 2SC1815 SOT-23 NPN
<i>Miscellaneous</i>				
01TI-L494-09	U1	1	IC	SMD TL494C SO-16 PWM
1501-0509-04	CN1 CN2	2	socket	PITCH 2.54mm 5PIN 90°
LED PCB				
0701-3102-02	R1 R2 R3 R4 R5 R6 R7 R8	8	resistor	SMD 1KΩ 1/4W ±5% 1206
2100-0067-02		2	wire	2PIN UL1007 AWG26 L=70mm 5mm 105C
2100-0068-02		1	wire	2PIN UL1007 AWG26 L=210mm 2.54,5mm,105C
2005-0009-00	LED1 LED2 LED3 LED4 LED5 LED6 LED7 LED8	8	LED	LED 2*3*4mm,
06S121046000	C1	1	SMD capacitor	SMD 0.1uF/50V 0805 X7R ±10%

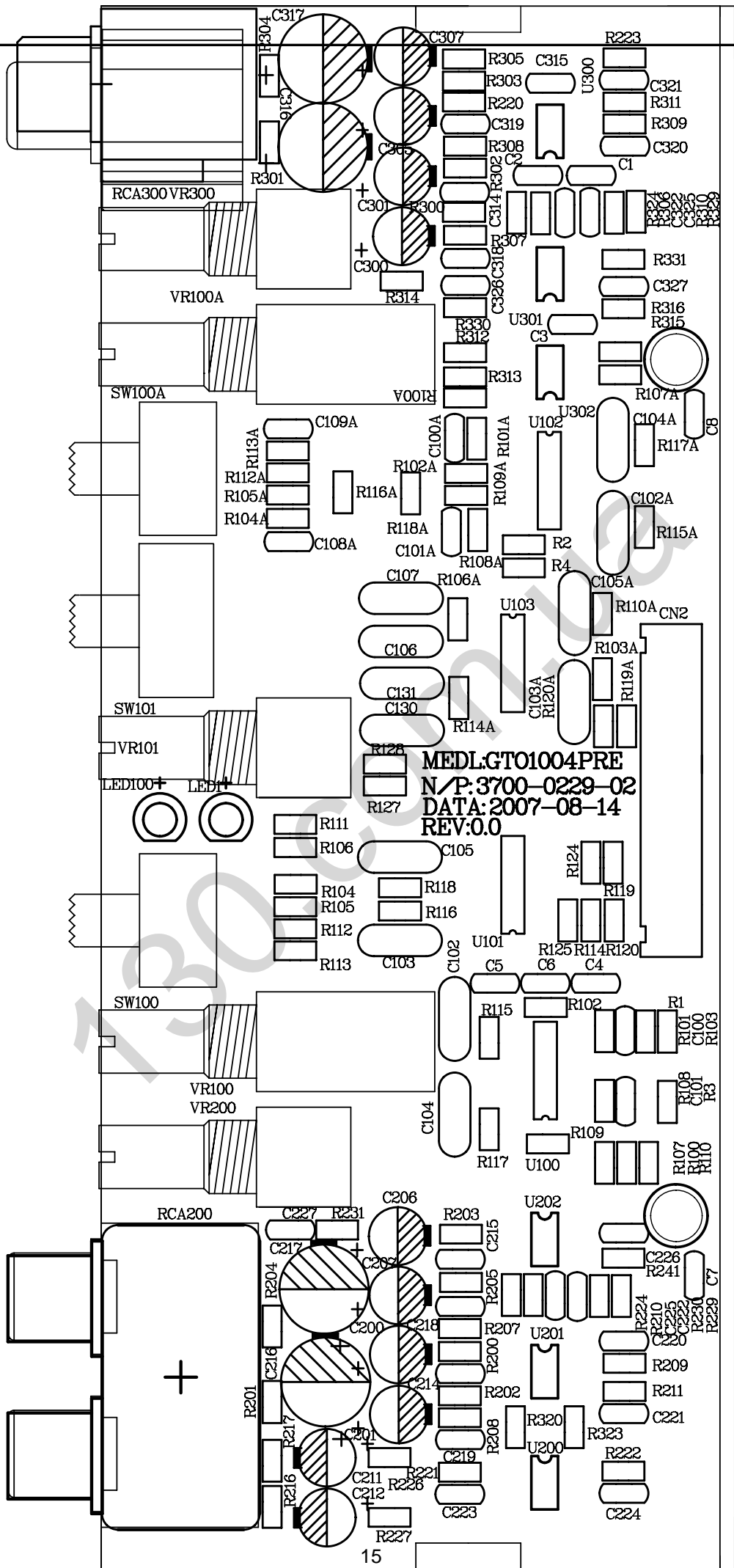




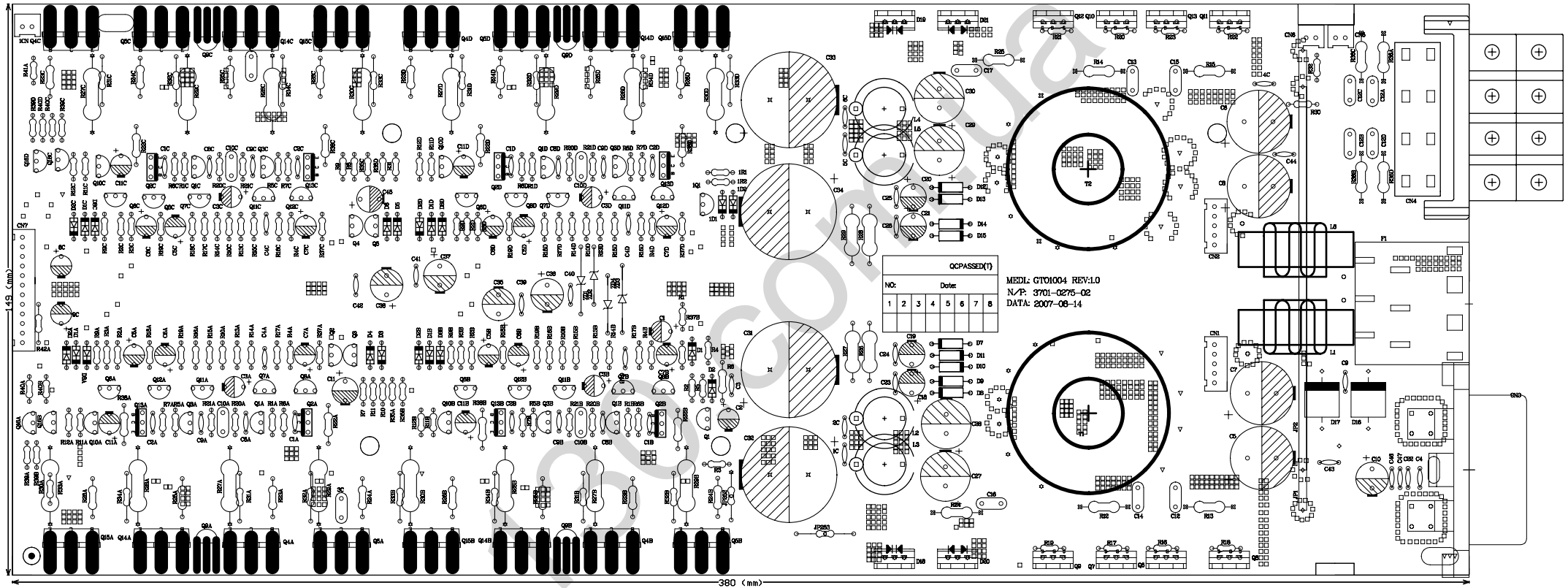
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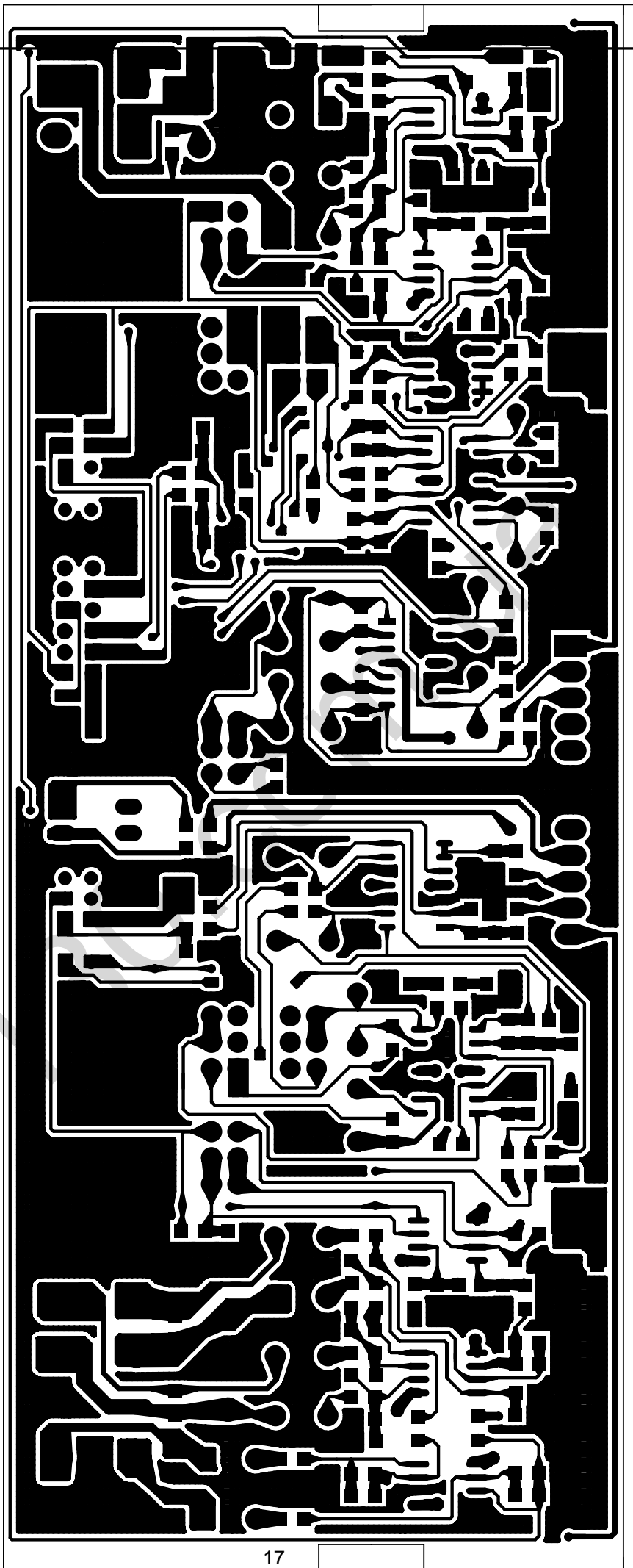




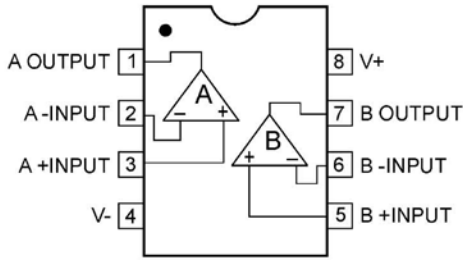


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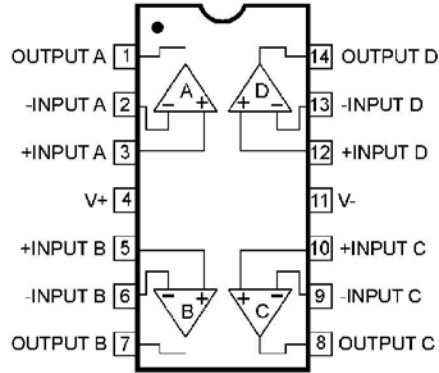




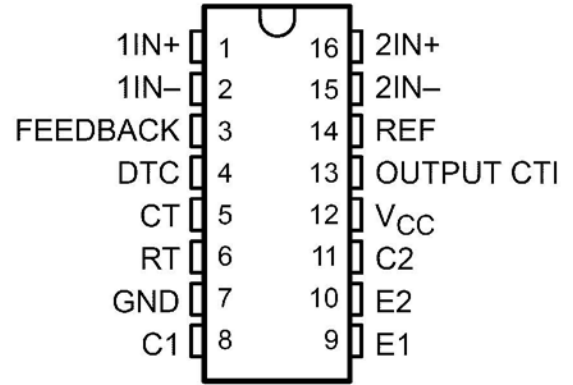
NJM4558L Dual Op-Amp
U200-202, U300-302



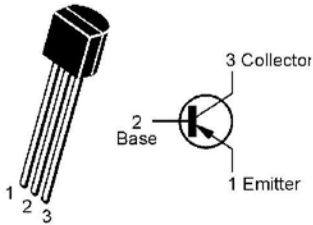
OPAMP, QUAD 14P DIL TL074
U100-103



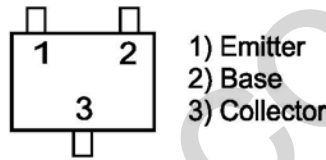
TL494 PWM
U1



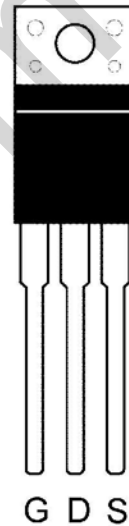
2N5401
Q11A-11D, Q12A-12D



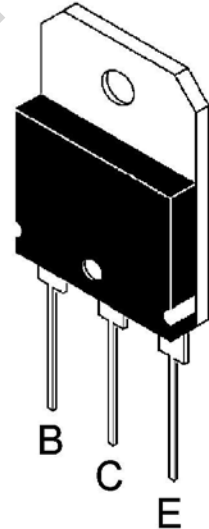
2SA1015 Q10
2SC1815 Q1-3, Q7
SOT23



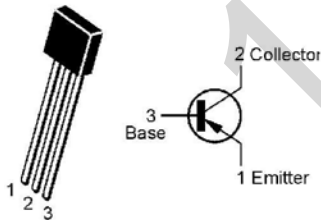
HFP50N06
MOSFET
Q6-Q13



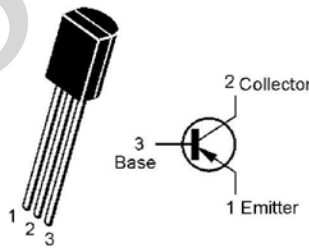
TIP35C, TIP36C
Q4A-4D, Q5A-5D,
Q14A-14D, Q15A-15D



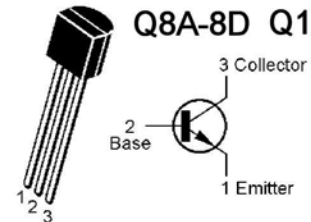
KTA1023
Q8, Q9



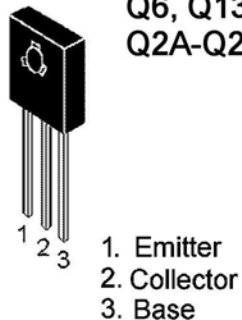
2SB647A
Q1A-1D



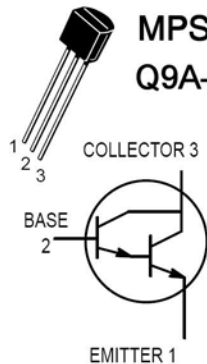
2SC8050 2N5551
Q6A-6D Q7A-7D,
Q8A-8D Q10A-10D



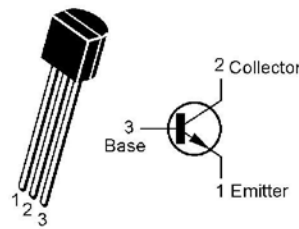
2SB649 2SD669A
Q6, Q13A-13D
Q2A-Q2D



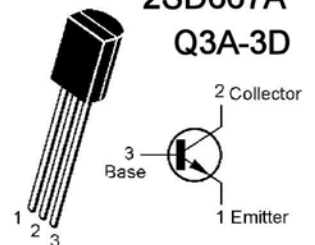
MPSA13
Q9A-9D

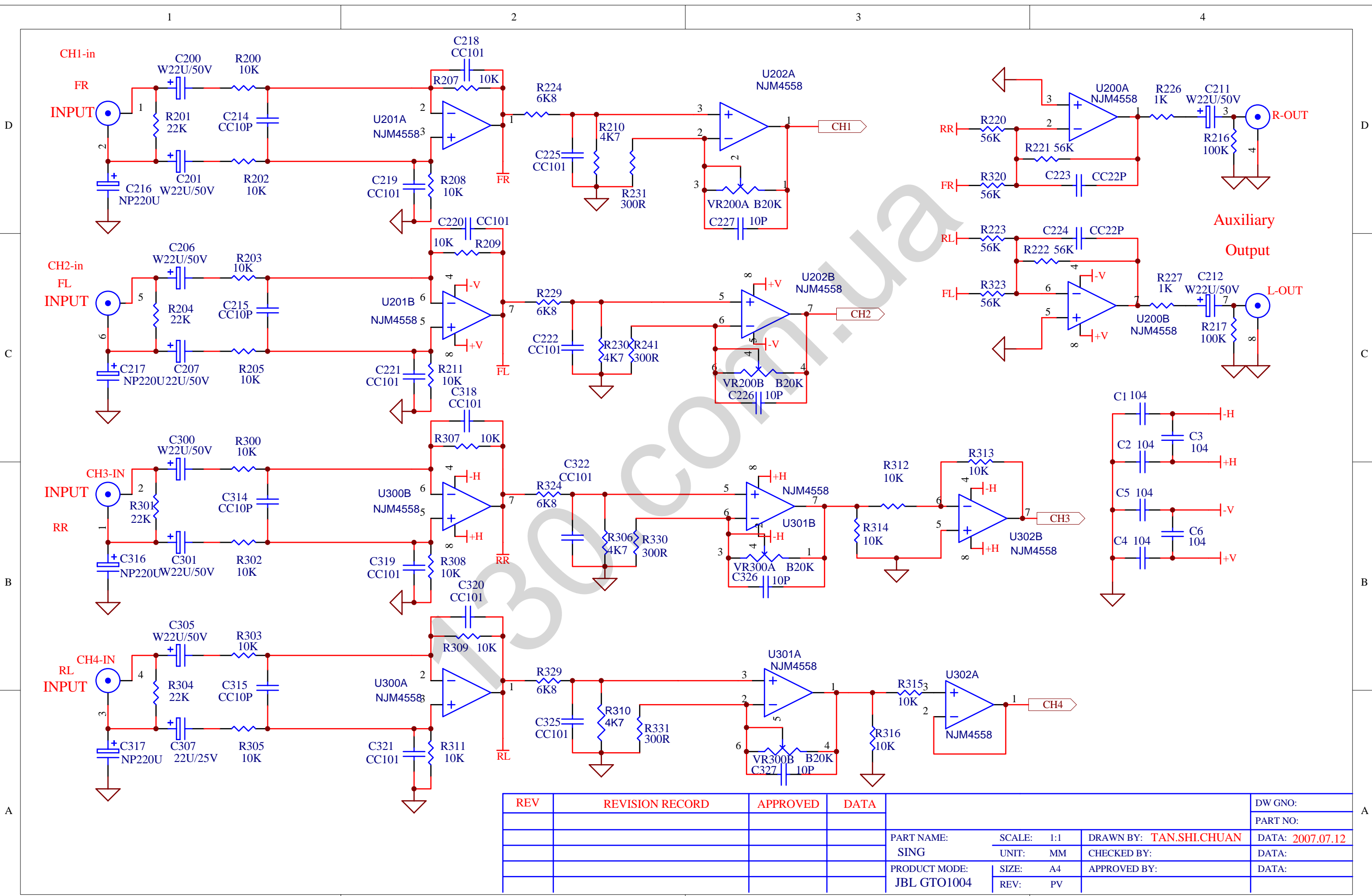


2SC1815
Q2-Q5

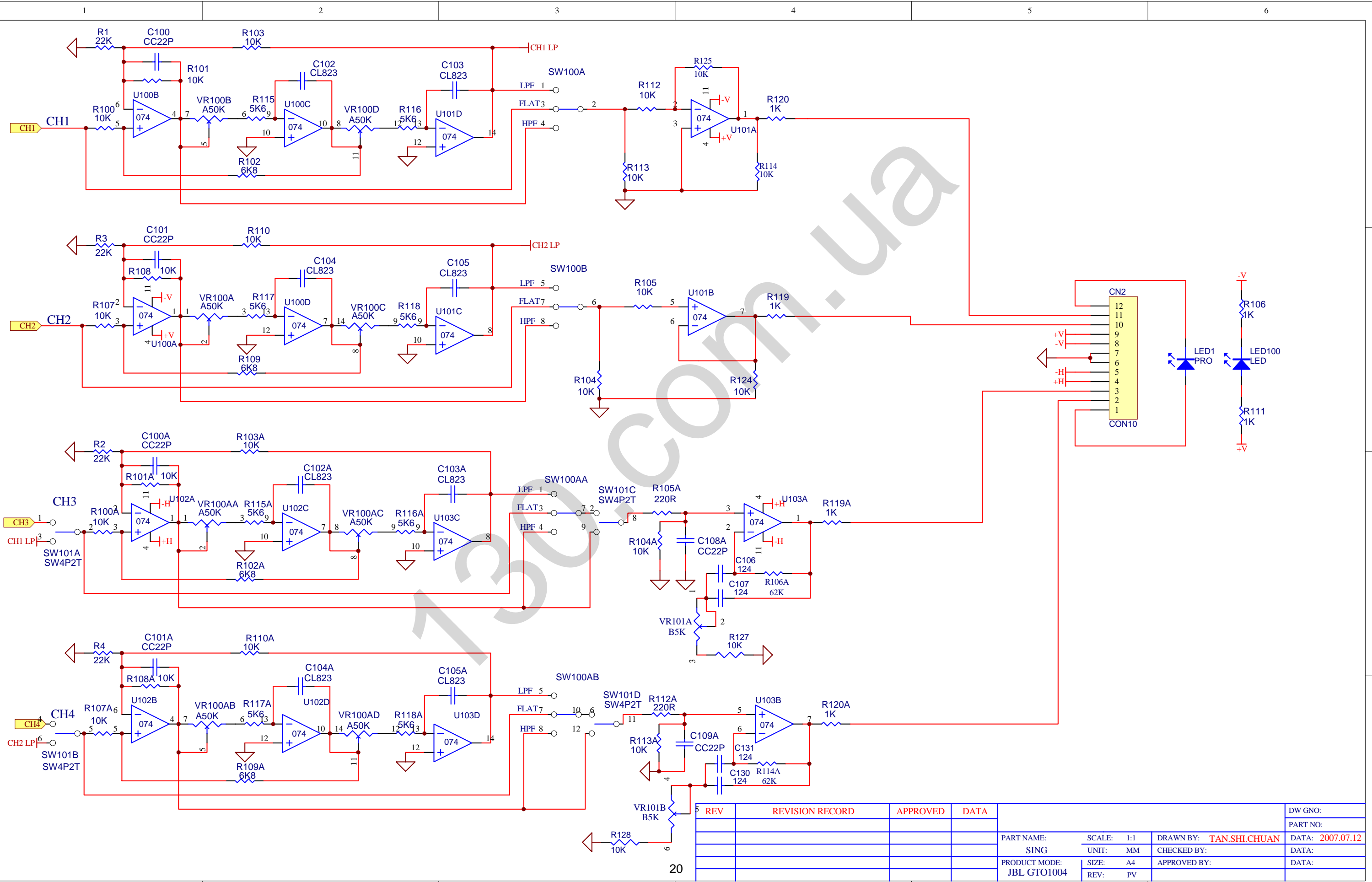


2SD667A
Q3A-3D



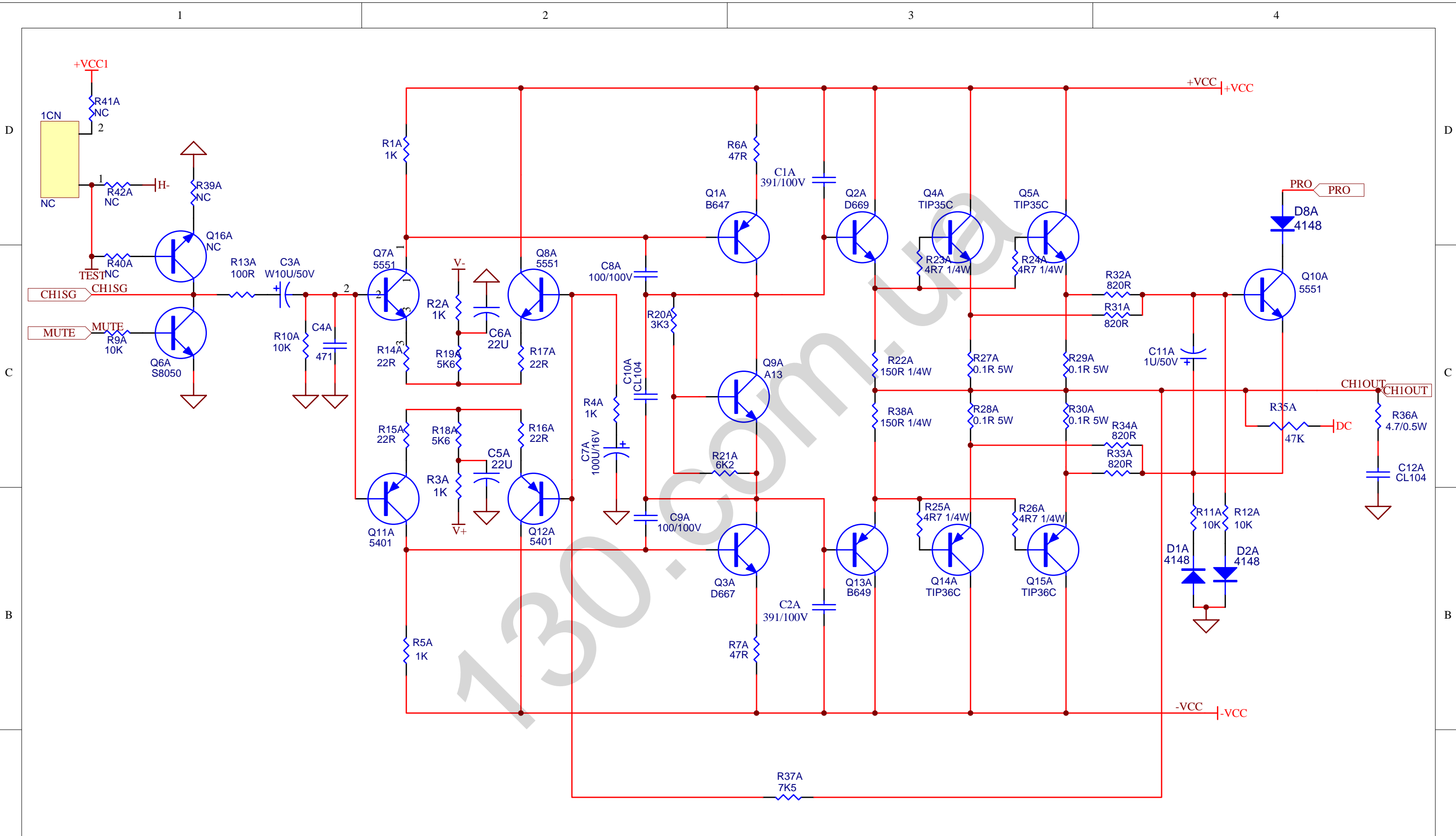


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				SIZE: A4
				REV: PV
				DRAWN BY: TAN.SHI.CHUAN
				CHECKED BY:
				APPROVED BY:
				DATA: 2007.07.12
				DATA:
				DATA:

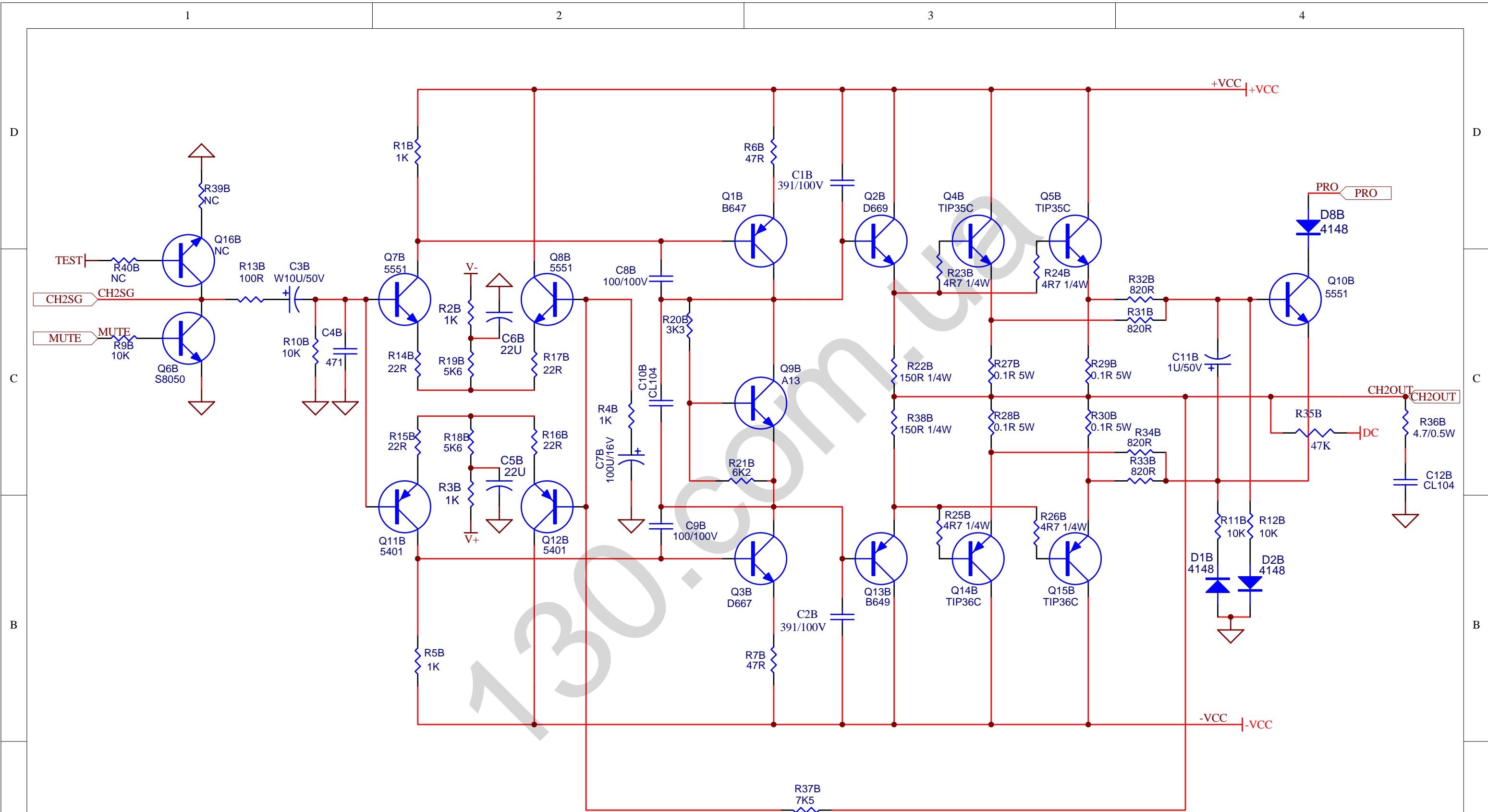


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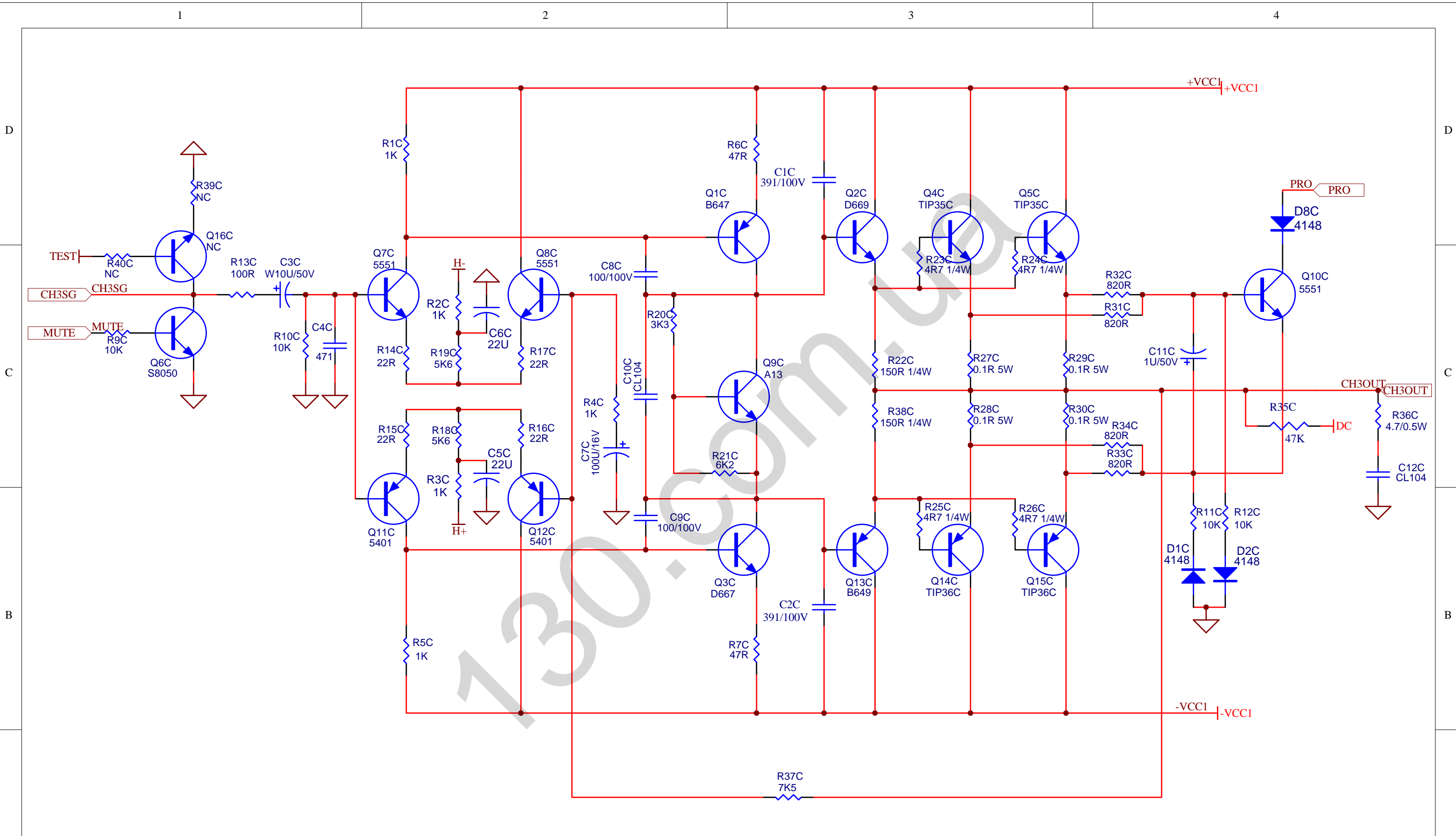
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JBL GTO1004	REV: PV		



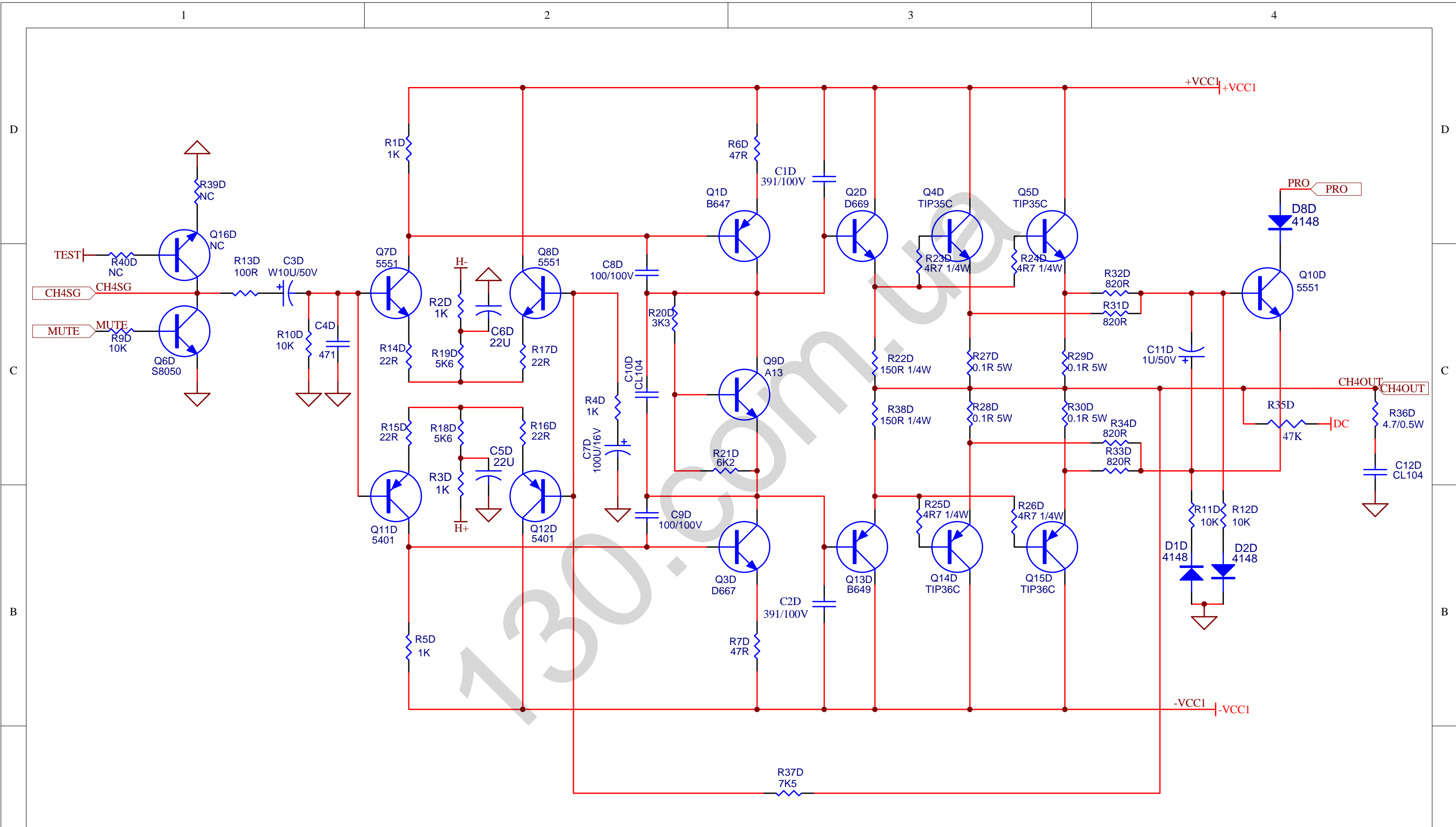
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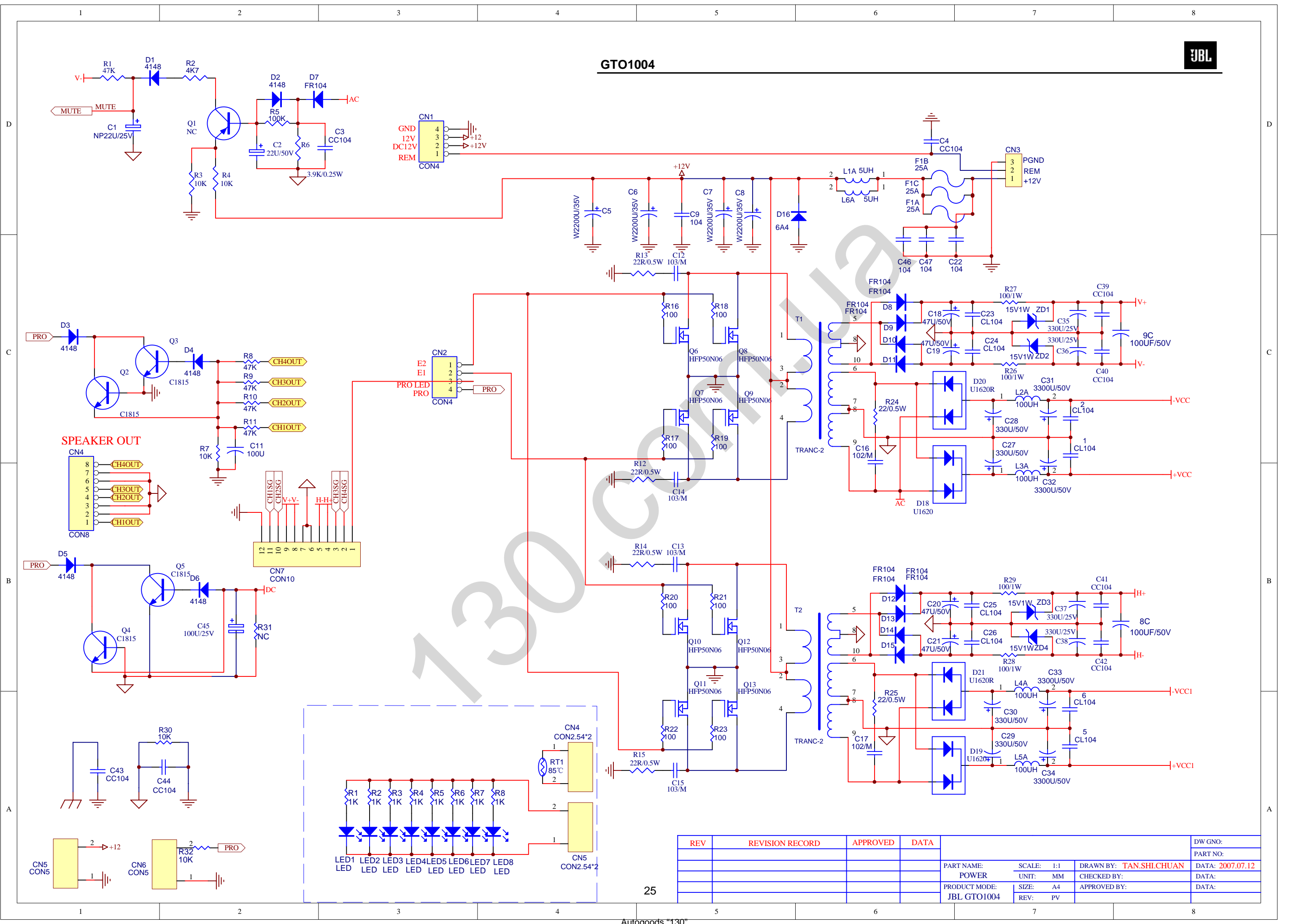


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				JBL GTO1004	REV: PV		



REV	REVISION RECORD	APPROVED	DATA			DW GNO:
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				PRODUCT MODE: JBL GTO1004	UNIT: MM	CHECKED BY:
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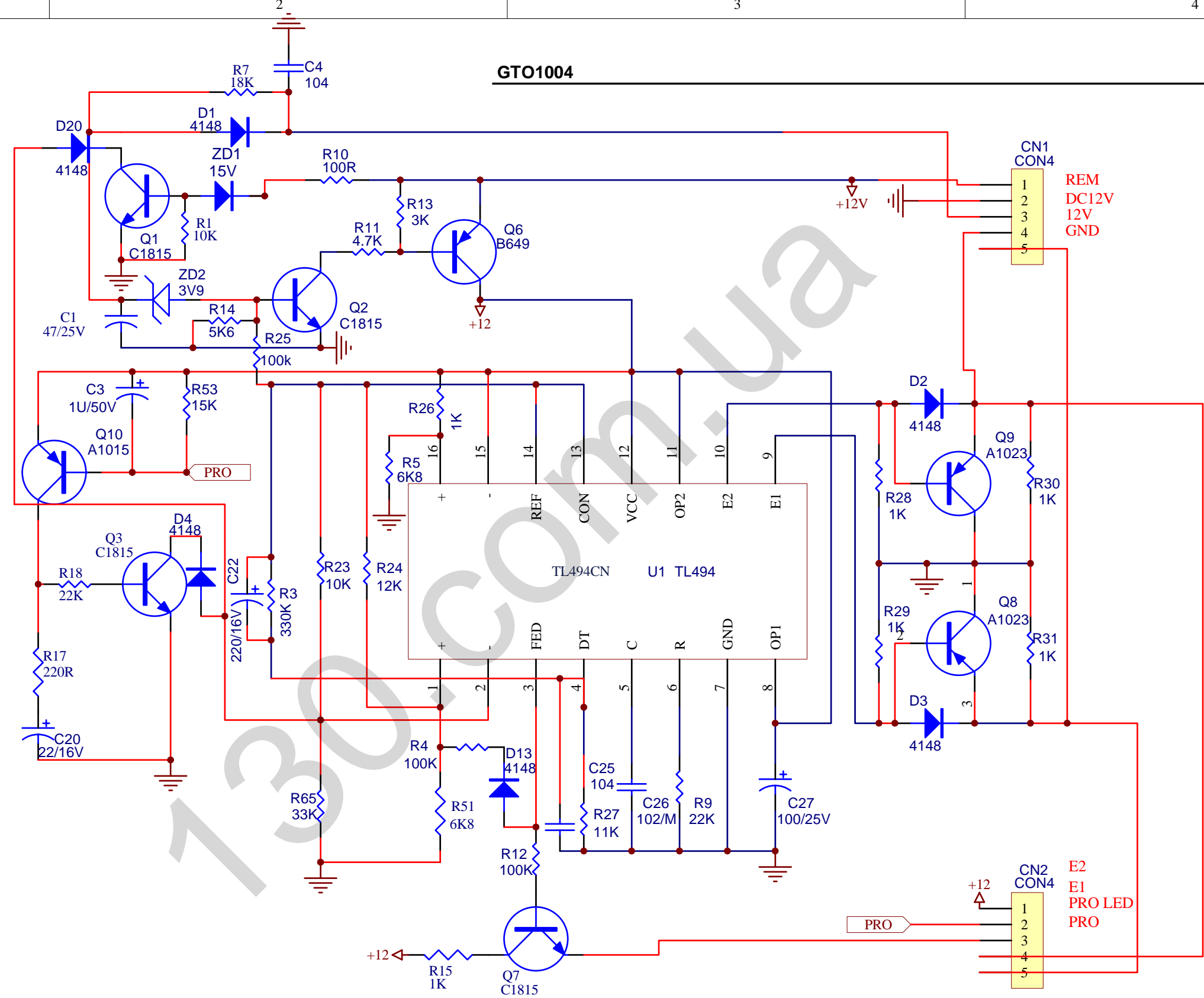
GTO1004



REV	REVISION RECORD	APPROVED	DATA	DW GNO:

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POWER	UNIT: MM	CHECKED BY:	DATA:
PRODUCT MODE:	SIZE: A4	APPROVED BY:	DATA:
JBL GTO1004	REV: PV		

GTO1004



ECN NO	DESCRIPTION	APPROVED	DATA				DWG NO:
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				JBL GTO1004	REV: PV		