# Reference Series
# 475a

## 4,3,2 CHANNEL POWER AMPLIFIER

## SERVICE MANUAL


Infinity Systems, Inc.
250 Crossways Park Dr.
Woodbury, New York 11797

Rev1 3/2008

Released 2007

Discontinued XXXX

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## Reference 475a Basic Specifications

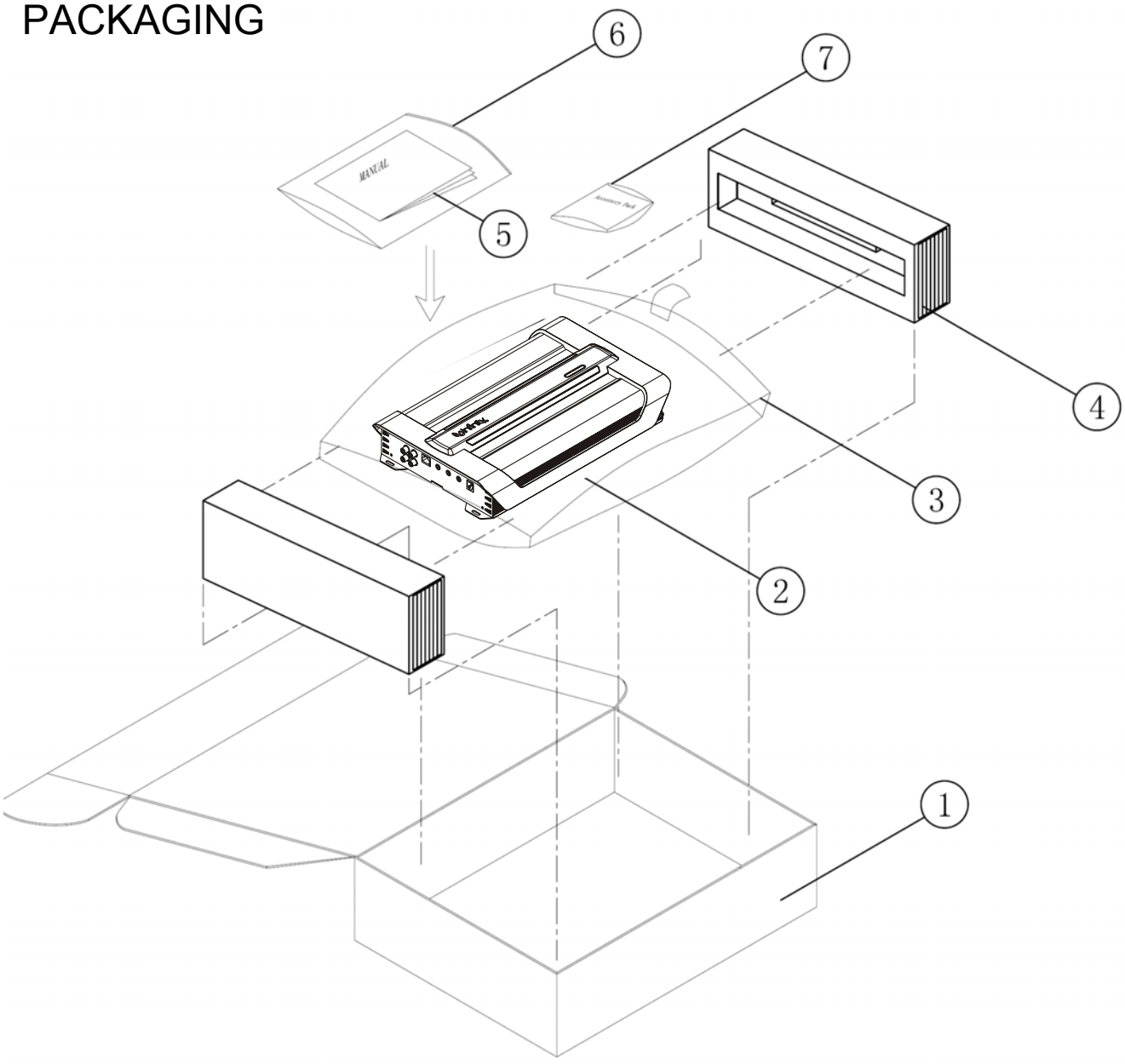
| | |
|---|---|
| Output Power: | 75W RMS x 4 @ 4 ohms; ≤1% THD + N |
| (14.4 VDC) | 90W RMS x 4 @ 2 ohms; ≤1% THD + N |
| Signal-to-noise ratio: | 85dBA (reference 1W into 4 ohms) |
| Dynamic power: | 117W channels @ 2 ohms |
| Effective damping factor: | 6.3 @ 4 ohms |
| Frequency response: | 10Hz – 100kHz (-3dB) |
| Maximum input signal: | 6.0V |
| Maximum sensitivity: | 100mV |
| Output regulation: | 0.21dB @ 4 ohms |
| Dimensions (L x W x D): | 14-3/16" x 9" x 2-11/16" (361mm x 229mm x 69mm) |
| Fuse: | 2 x 35A |

Infinity 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.

## INFINITY REFERENCE 475a AMPLIFIER SPECIFICATIONS

| TEST VOLTAGE 14.4 +0.1V | | | |
|---|---|---|---|
| | | | |
| Specification | Rating | Unit | Remarks |
| Power Output 4ohm loads @1kHz (stereo mode) for each ch @<1.0%THD (Unit:W)(LPF=22K) | ≥75W x 4 | Watts | |
| Power Output 2ohm loads @1kHz (stereo mode) for each ch @<1.0%THD (Unit:W)(LPF=22K) | ≥90W x 4 | Watts | |
| Bridged (Stereo) Mode 4ohm loads @1kHz | ≥240W x 2 | Watts | |
| THD Power 4 ohm loads and 1MD@Reference (Unit:%) LPF=22K | ≤0.5% @1kHz | % | |
| THD Power 2 ohm loads and 1MD@Reference (Unit:%) LPF=22K | ≤0.5% @1kHz | % | |
| THD Power 4 ohm loads Bridged (Stereo) Mode (Unit:%) LPF=22K | ≤0.5% @1kHz | % | |
| Channel Separation @full rated power (+80KHZ) @1kHz | ≥45dB | | |
| Full rated power Distortion 1KHz LPF=22KHz | ≤0.1% | % | |
| Signal/Noise Ratio a: 1 watt into 4 ohms b: full rated power (dB) | >90 | dBA | 1 watt into 4 ohms 1V signal input |
| Input Sensitivity Low Level Input(v) @:full rated power | 100mV-6V | Volts | ±20% |
| Frequency response (Unit:-3dB) | 10Hz~100kHz | Hz | -3dB |
| High-Pass Crossover Frequency limits +20% | 40Hz – 450Hz | Hz | |
| Low-Pass Crossover Frequency limits +20% | 40Hz – 450Hz | Hz | |
| Bass Boost:(Unit:dB) @50Hz (±5Hz ) | 0~6dB | dB | ±1dB |
| Idle Current ( @ 4ohm) | 0.5A | A | ±0.15A |
| MAX current : rated power (All channel 2 ohm loads) | ≤65A | A | |
| DC Offset: | ≤30mV | mV | |
| Damping Factor (4ohm): | > 200 | | |
| Effective damping factor (4ohm): | 6.395 | | |
| Dynamic Power @ 2 ohms | 130W | Watts | |
| Output Regulation @ 4 ohms | 0.03dB | dB | |
| Remote Operating Voltages: | ON 5V OFF 4V | Volts | ±1V |
| Turn on delay time | 2 to 3 | Sec | |
| Circuit Protection<br>a. Temperature<br>b. Speaker Short Circuit<br>c. Operating Voltage Range | <br>95 ±5 deg C<br>Yes<br>8~16V | | <br><br><br>+0.5V |
| Dimensions (L x W x H): | 14-3/16" x 9" x 2-11/16" (361mm x 229mm x69mm) | Inches mm | |
| Fuses | 35A x 2 | A | |

# PACKAGING




| Item | Part Number | Description | Qty |
|---|---|---|---|
| | | | |
| 1 | CH4482901203 | Outer Carton | 1 |
| 2 | REF475a | REF475a Amplifier | 1 |
| 3 | | Plastic Bag | 1 |
| 4 | BZL279112001 | Packing Foam | 1 |
| 5 | Visit Infinitysystems.com | Owner's manual | 1 |
| 6 | | Plastic Bag | 1 |
| 7 | | Accessory kit consisting of: | 1 |
| | LS1CJ0402507 | Mounting Screws | 4 |
| | 1601-353G-00 | SPARE 35A FUSES | 2 |

## APPLICATIONS – 475a

The 475a can be set up for stereo 4-channel, 3-channel or bridged 2-channel operation, as shown in Figures 5 through 8.

**NOTE:**

- Minimum speaker impedance for stereo operation is 2 ohms. Minimum speaker impedance for bridged operation is 4 ohms.
- Not all possible applications are shown here; e.g., the applications shown in Figures 5, 6 or 8 could include a separate subwoofer driven by an additional amplifier. In that case, the user should refer to Figure 6 for crossover and sub amp connection suggestions.

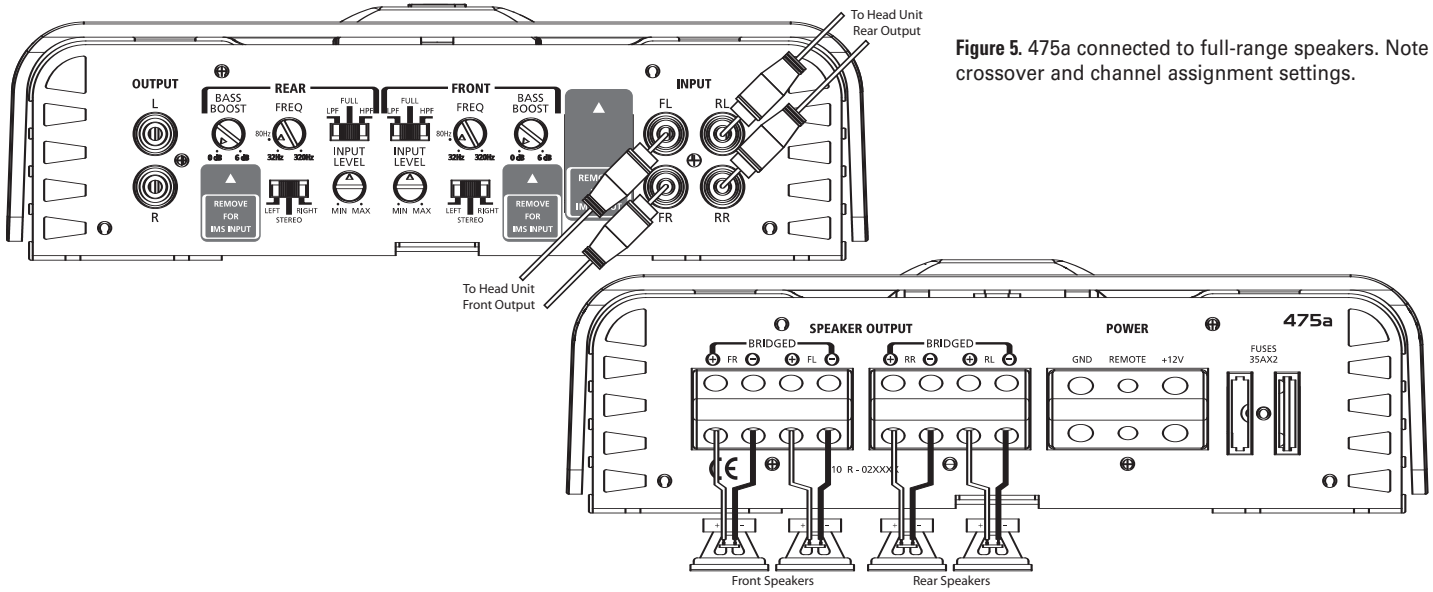



**Figure 5.** 475a connected to full-range speakers. Note crossover and channel assignment settings.

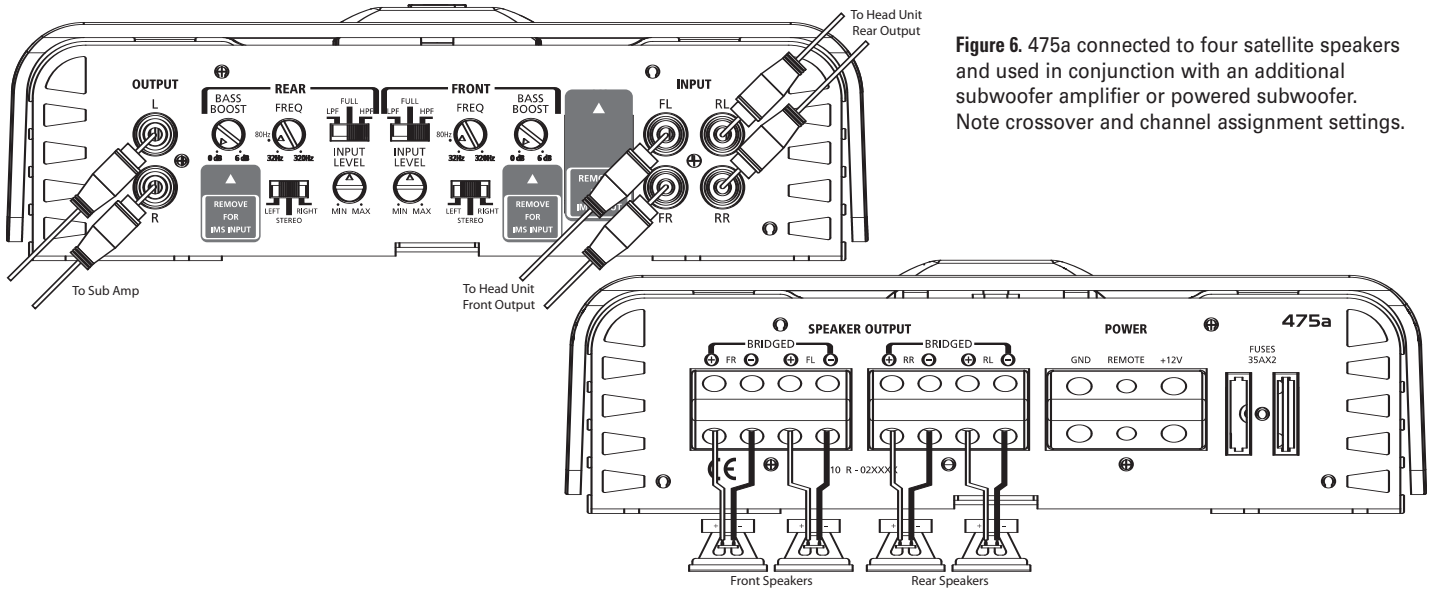



**Figure 6.** 475a connected to four satellite speakers and used in conjunction with an additional subwoofer amplifier or powered subwoofer. Note crossover and channel assignment settings.

## APPLICATIONS – 475a

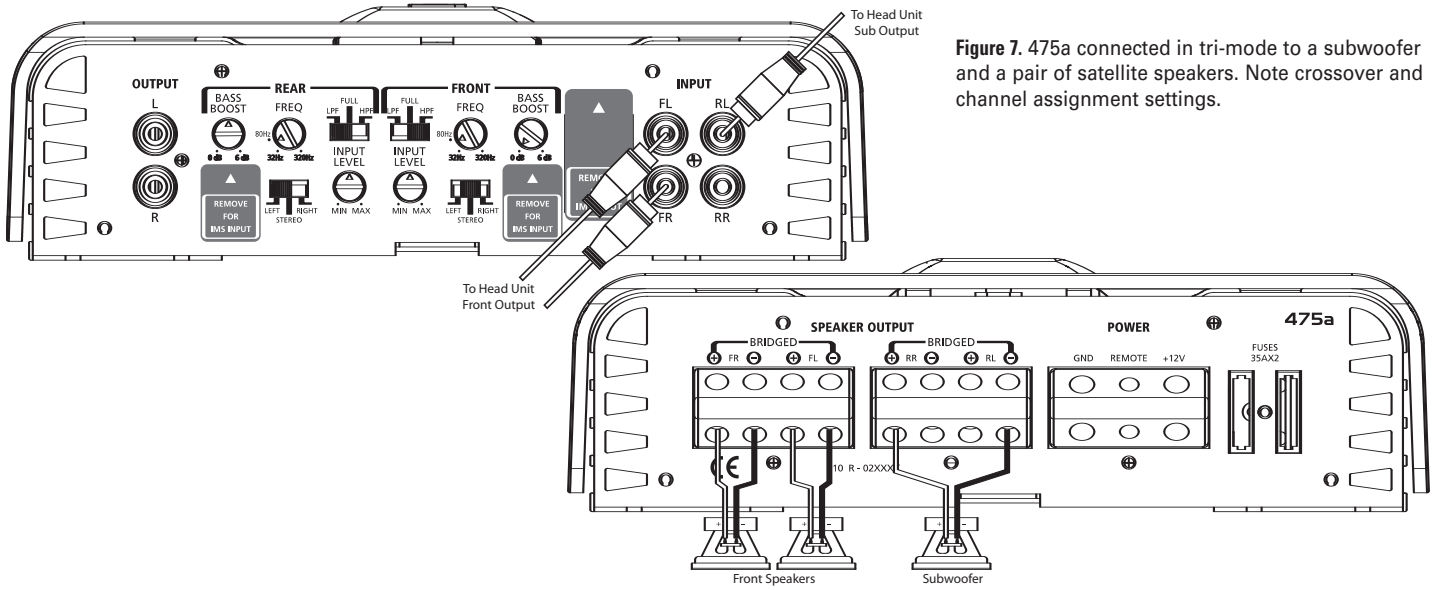



**Figure 7.** 475a connected in tri-mode to a subwoofer and a pair of satellite speakers. Note crossover and channel assignment settings.

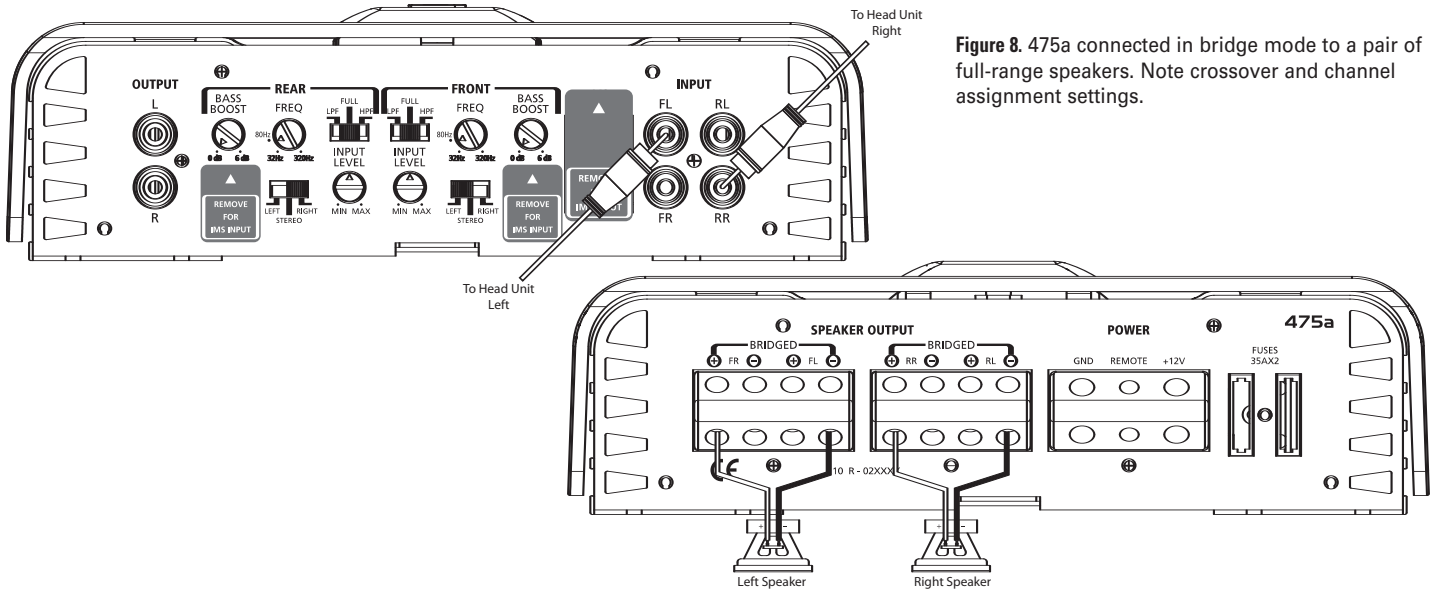



**Figure 8.** 475a connected in bridge mode to a pair of full-range speakers. Note crossover and channel assignment settings.

## Installation and Setup

Refer to the illustrations on the previous pages for control location.

Reconnect the (–) negative lead to the vehicle's battery. Apply power to the audio system and play a dynamic music track.

**SETTING THE CROSSOVER(S)**
Determine your system plans and set the crossover-mode switch accordingly. If your system design does not include a subwoofer, set the crossover mode to FULL and skip to "Setting Input Sensitivity."

If your system includes a subwoofer, set the crossover mode to HP (high-pass) for your full-range speakers. Adjust the crossover frequency to limit bass, and provide increased system volume with less distortion.

**Mode Switch:**
**Full:** Allows a full-range signal through to the speakers; can be used with larger full-range speakers such as 6" x 9"s.
**HP:** Allows a high-pass signal through to the speakers; should be used with most loudspeakers (can protect your full-range speakers from being overdriven with low frequencies, one cause of speaker damage).
**LP:** Allows only bass to pass through to the speakers; should be selected when powering subwoofers.

**High-Pass Filters:** Initially set the crossover-frequency control midway. While listening to music, adjust the crossover for the least perceived distortion from the speakers, allowing them to reproduce as much bass as possible.

**Low-Pass Filters:** For subwoofers, choose the highest frequency that removes vocal information from the sound of the subwoofer.

If using the 475a to drive a subwoofer(s), set the crossover mode to LP (low-pass) on the channels connected to the subwoofer.

**NOTE:** The 1300a, 1600a and the subwoofer output of the 5350a are low-pass only and do not have a crossover-mode switch.

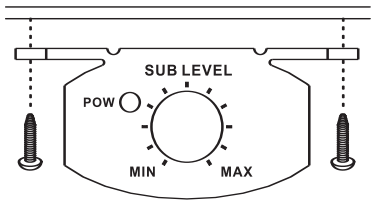
**SETTING INPUT SENSITIVITY**
1. Initially turn the INPUT LEVEL control(s) to the minimum (counterclockwise) position.
2. On the source unit, increase the volume control to 3/4 volume. Slowly increase the INPUT LEVEL control(s) toward three o'clock until you hear slight distortion in the music. Then reduce the INPUT LEVEL slightly until distortion is no longer heard.

**NOTE:** After the source unit is on, blue LEDs (on the top panel) will light, indicating the amplifier is on. If not, check the wiring, especially the remote connection from the source unit. Also refer to "Troubleshooting."

**REMOTE LEVEL CONTROL**
The 1300a, 1600a and 5350a include a remote level control. This will allow the subwoofer level to be adjusted from the listening position. Connect the remote level control using the RJ11 jack on the side of the amplifier. Install the control module in the front of the vehicle within easy reach of the driver. Both the under-side of the dash and the center console are suitable locations.

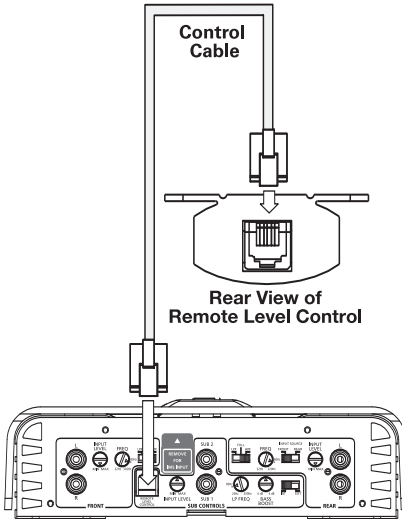
**UNDER-DASH MOUNTING**
Select a mounting location that allows easy access to the control while driving. Using the REMOTE LEVEL control as a template, mark and drill holes in the mounting surface. Attach the REMOTE LEVEL control using the mounting screws provided (Figure 11).

**Figure 11.** Under-dash mounting of the REMOTE LEVEL control.




Route the cable behind the dash or other interior panels and under the carpet. Do not route the cable outside the vehicle. Connect the RJ11 cable between the RJ11 receptacle on the amp and the receptacle on the REMOTE LEVEL control (Figure 12).

**Figure 12.** REMOTE LEVEL control electrical connection.

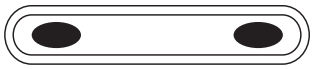



**SETTING THE BASS BOOST**
The Bass Boost control will allow you to enhance the bass output of your system at 50Hz up to 6dB.

**AUX OUTPUT**
Reference amplifiers (except 5350a) are equipped with full-range outputs that can be used to connect additional amplifiers.

**STATUS LEDs**
**Power:** Indicates the amplifier is on.
**Protection:** Refer to "Troubleshooting" for specific indications.

**Figure 13.** LED status.




## Troubleshooting

- **PROBLEM:** No audio (POWER LED is off).
  CAUSE and SOLUTION: No voltage at BATT+ and/or REM terminals, or bad or no ground connection. Check voltages at amplifier terminals with VOM.

- **PROBLEM:** No audio (PROTECT LED glows red).
  CAUSE and SOLUTION: DC voltage on amplifier output. Amplifier may need service; see enclosed warranty card for service information.

- **PROBLEM:** No audio (PROTECT LED glows red).
  CAUSE and SOLUTION: Amplifier is overheated. Make sure amplifier cooling is not blocked at mounting location; verify that speaker-system impedance is within specified limits.

- **PROBLEM:**
  No audio (PROTECT LED glows red).
  CAUSE and SOLUTION: Voltage less than 9V on BATT+ connection. Check vehicle charging system.

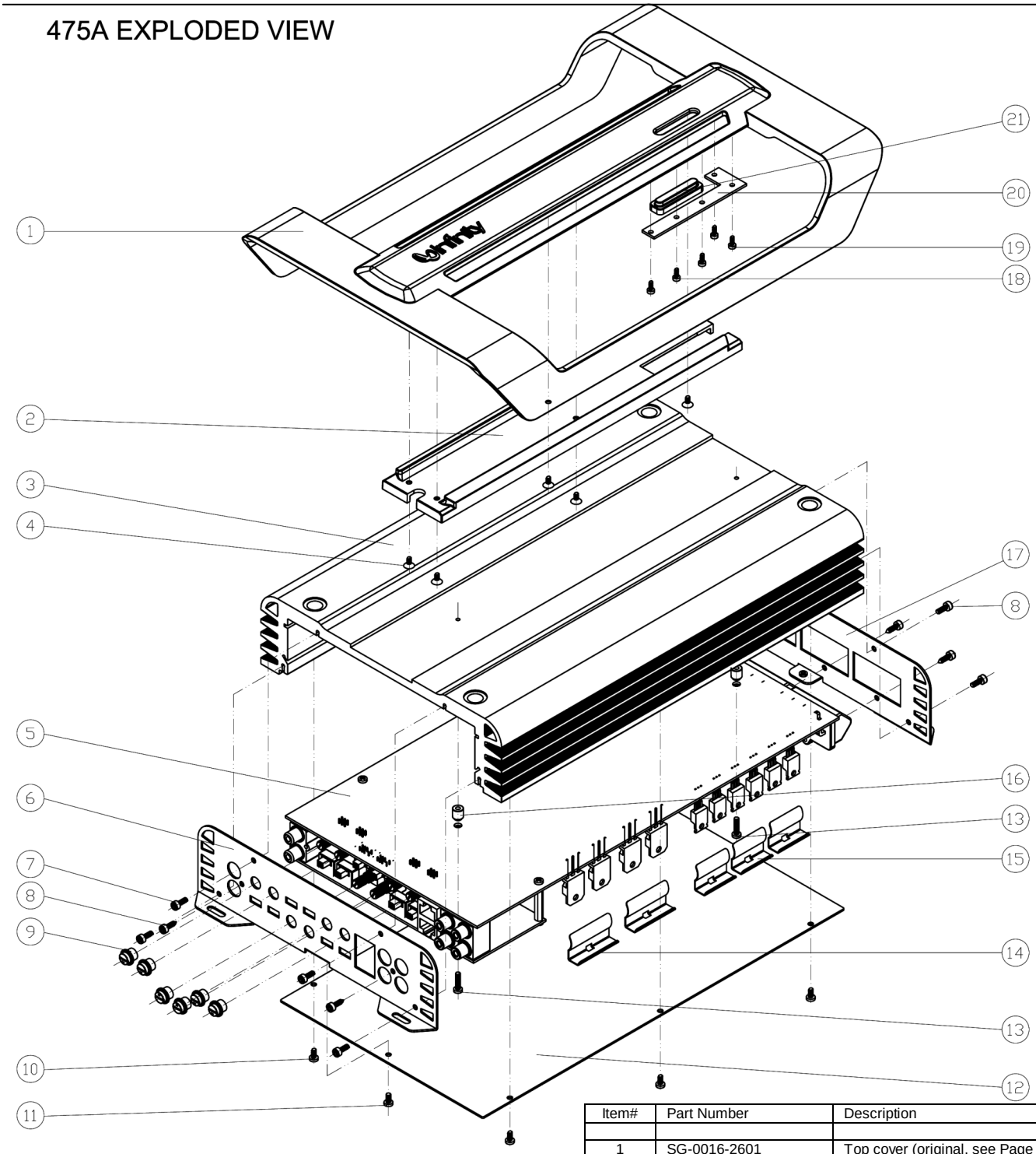
- **PROBLEM:** No audio (PROTECT LED glows red).
  CAUSE and SOLUTION: Voltage greater than 16V or less than 8.5V on BATT+ connection. Check vehicle charging system.

- **PROBLEM:** Distorted audio.
  CAUSE and SOLUTION: Input sensitivity is not set properly, or amplifier or source unit is defective. Check INPUT LEVEL setting, or check speaker wires for shorts or grounds.

- **PROBLEM:** Distorted audio (PROTECT LED glows intermittently).
  CAUSE and SOLUTION: Short circuit in speaker or wire. Remove speaker leads one at a time to locate shorted speaker or wire, then repair.

- **PROBLEM:** Music lacks "punch."
  CAUSE and SOLUTION: Speakers are not connected properly. Check speaker connections for proper polarity.

## 475A EXPLODED VIEW




| Item# | Part Number | Description | Qty |
|---|---|---|---|
| | | | |
| 1 | SG-0016-2601 | Top cover (original, see Page 8) | 1 |
| | SG-0001-2607 | Top cover (Rev1, see Page 8) | 1 |
| 2 | GD-600011400 | Light panel | 1 |
| 3 | SR-F475-0117 | Main heat sink | 1 |
| 4 | LSIFM0300011 | Screw | 5 |
| 5 | | Main PCB | 1 |
| 6 | MK-0005-2601 | Front panel | 1 |
| 7 | LS5KP0300807 | Screw for F/RP | 8 |
| 8 | LS5KJ0301007 | Screw for terminal, RCA jacks | 6 |
| 9 | XN-10500-012 | Knob | 6 |
| 10 | LSIAP0300607 | Screw | 6 |
| 11 | LSIAM0300607 | Screw | 2 |
| 12 | XG-0017-2601 | Bottom plate | 1 |
| 13 | LSIAY0301201 | Screw | 2 |
| 14 | PL-L0007-000 | Transistor spring clip (2) | 4 |
| 15 | PL-L0006-000 | Transistor spring clip (1) | 6 |
| 16 | ZL-10037A-15 | Space Pole | 2 |
| 17 | HG-0006-2601 | Rear panel | 1 |
| 18 | LSIAA0200501 | Screw | 1 |
| 19 | LS1AM0250401 | Screw | 4 |
| 20 | | LED PCB | 1 |
| 21 | CP-B00011400 | LED lens | 1 |

## NOTE ON TOP COVER FOR INFINITY REFERENCE MODELS REF475A, REF1300A, REF1600A

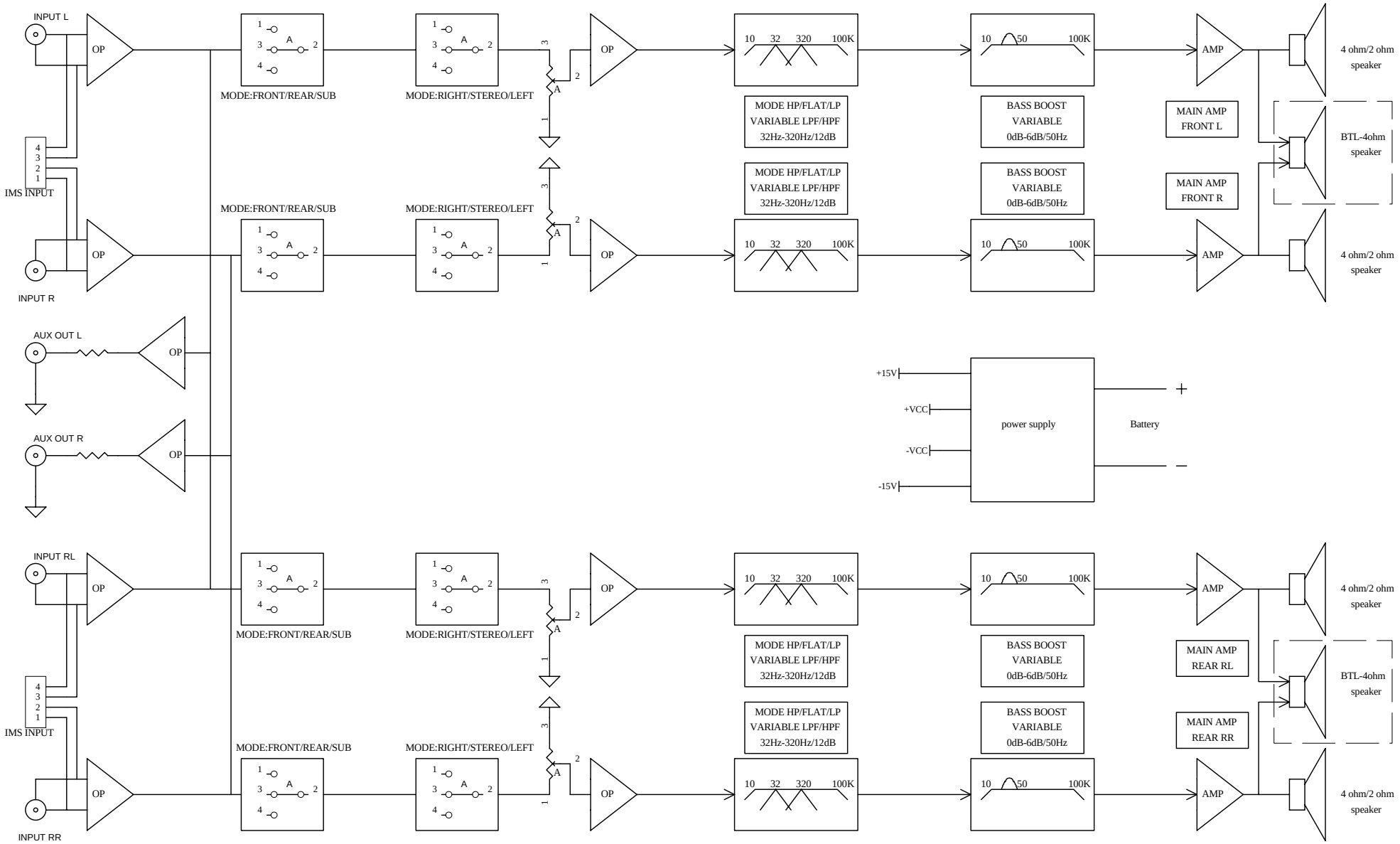
- There was a revision in the top cover design starting with the serial number range(s) noted below, or identified by the brace design in the supplied images.
- Note the Rev1 Top cover will not fit properly on the original heatsink.

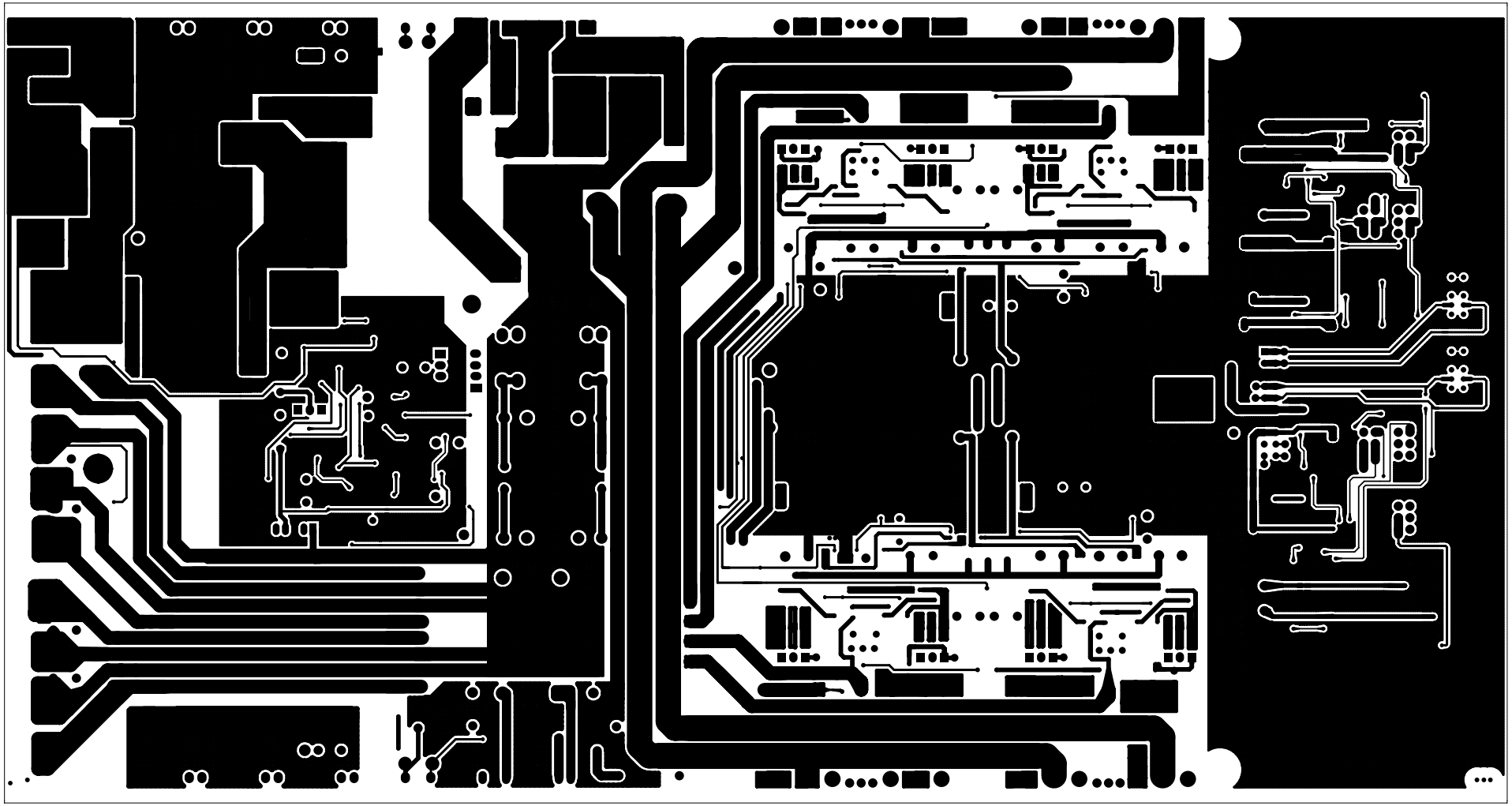
### Top Cover Part Numbers

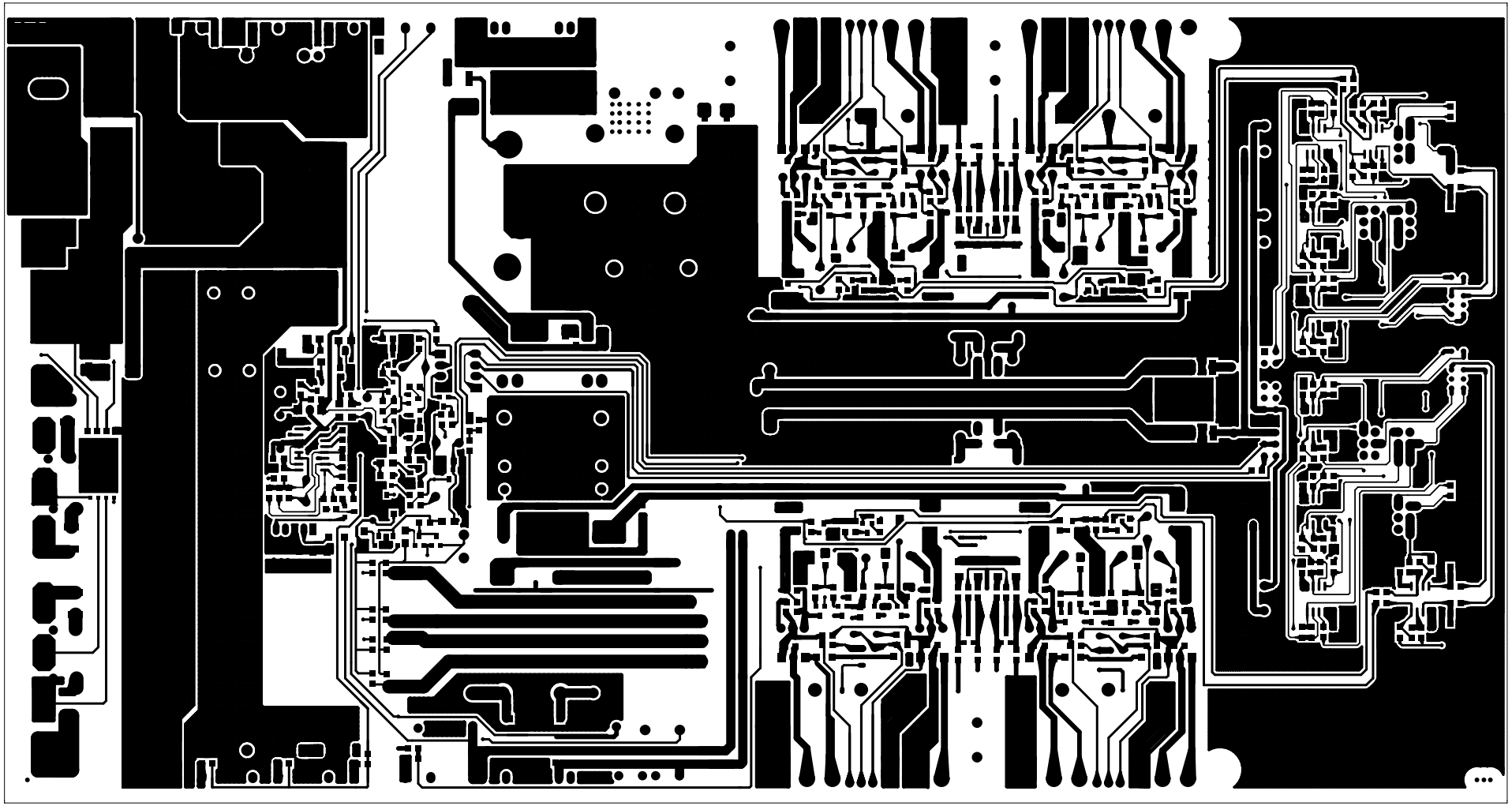
| MODEL | PART NUMBER | SERIAL NUMBER |
|---|---|---|
| **REF475A** | SG-0016-2601 | EV0001-01000 to EV0001-09138 |
| **REF475A** | SG-0001-2607 | EV0001-09139 And above |
| **REF1300A** | SG-0016-2601 | EV0003-01000 to EV0003-08606 |
| **REF1300A** | SG-0001-2607 | EV0003-08607 And above |
| **REF1600A** | SG-0016-2601 | EV0004-01000 to EV0004-11811 |
| **REF1600A** | SG-0001-2607 | EV0004-11812 And above |

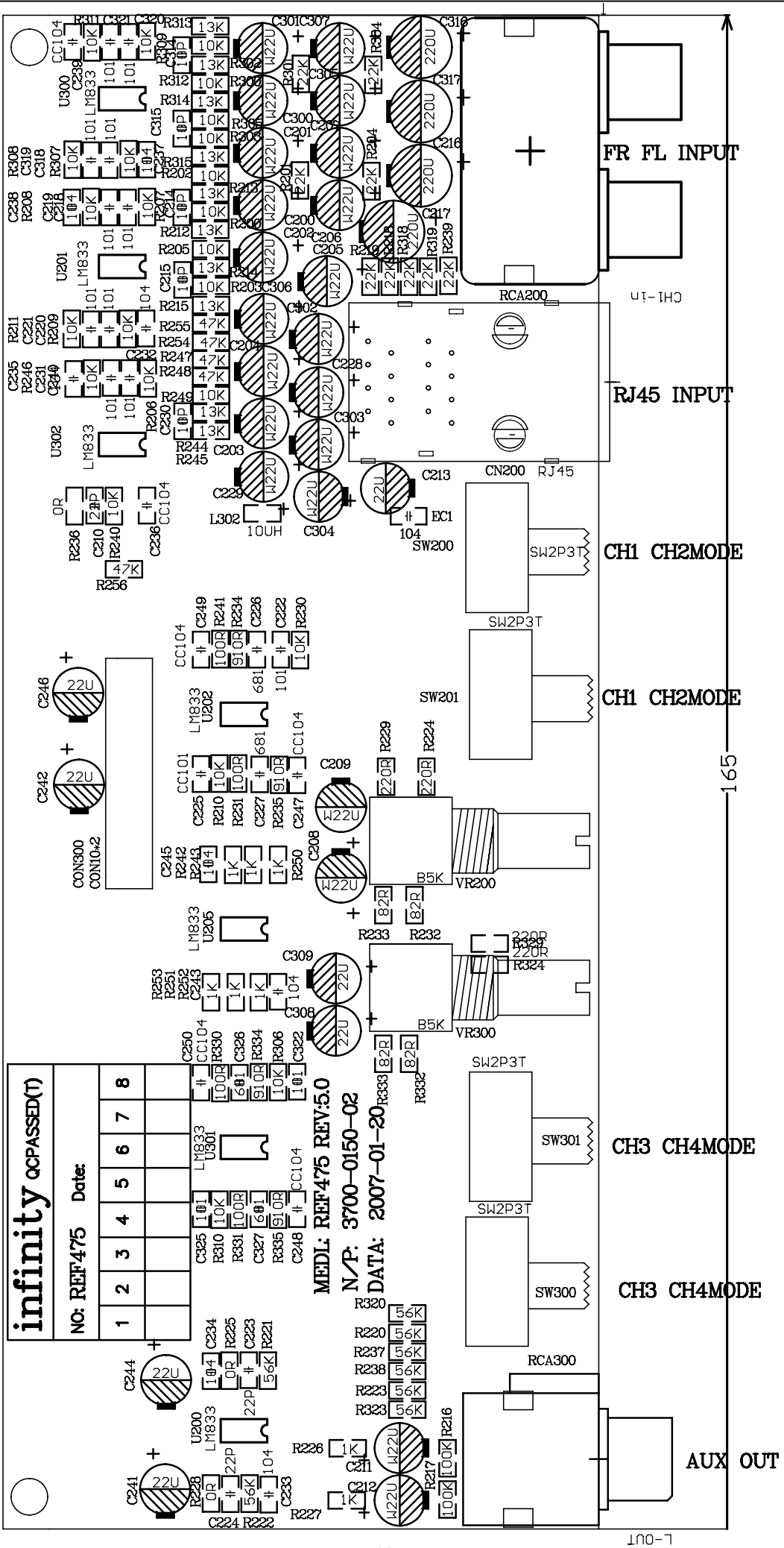
PART# SG-0016-2601 ORIGINAL TOP COVER

NEW TOP COVER PART # SG-0001-2607


INPUT L
OP
IMS INPUT
INPUT R
AUX OUT L
AUX OUT R
INPUT RL
INPUT RR
MODE:FRONT/REAR/SUB
MODE:RIGHT/STEREO/LEFT
MODE HP/FLAT/LP
VARIABLE LPF/HPF
32Hz-320Hz/12dB
BASS BOOST
VARIABLE
0dB-6dB/50Hz
10 32 320 100K
10 50 100K
AMP
MAIN AMP
FRONT L
MAIN AMP
FRONT R
MAIN AMP
REAR RL
MAIN AMP
REAR RR
4 ohm/2 ohm
speaker
BTL-4ohm
speaker
+15V
+VCC
-VCC
-15V
power supply
Battery






FR FL INPUT
RJ45 INPUT
CH1 CH2MODE
CH1 CH2MODE
CH3 CH4MODE
CH3 CH4MODE
AUX OUT
RCA200
RCA300
CN200 RJ45
SW200
SW201
SW301
SW300
VR200
VR300
SW2P3T
CH1-in
L-OUT
165
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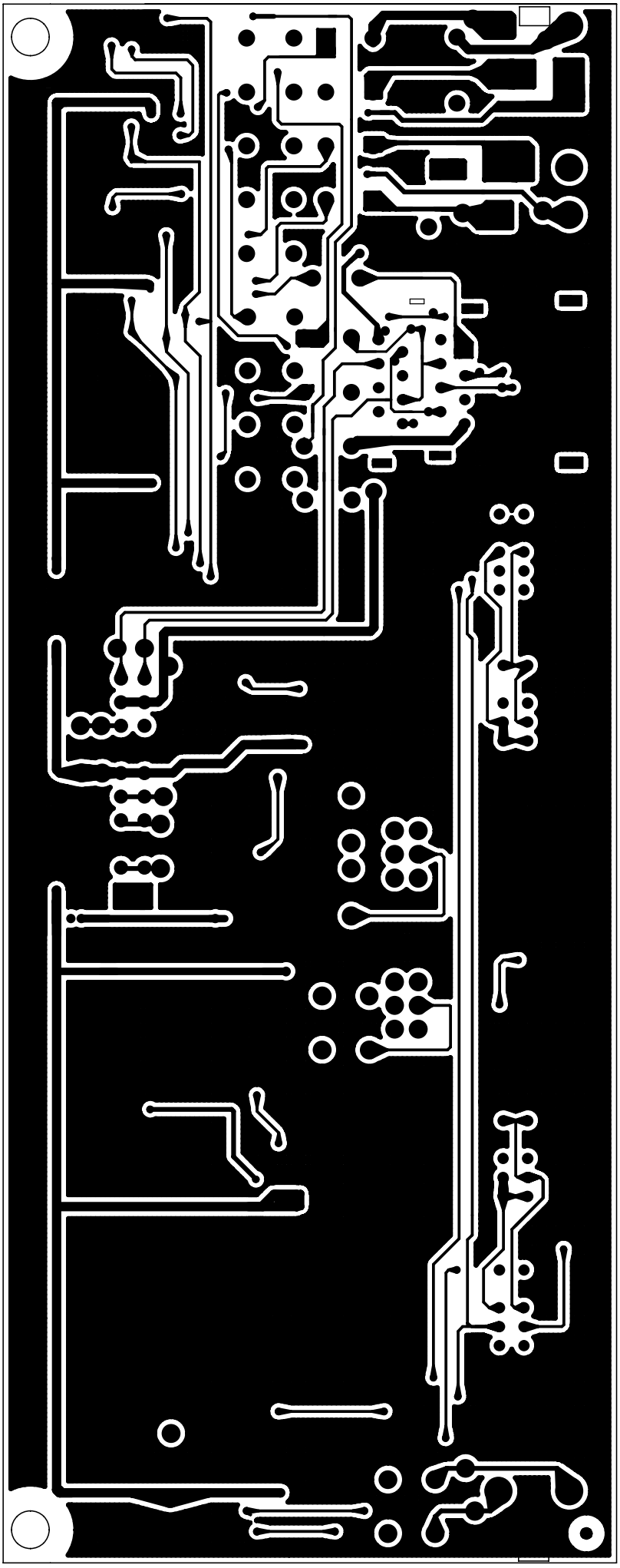
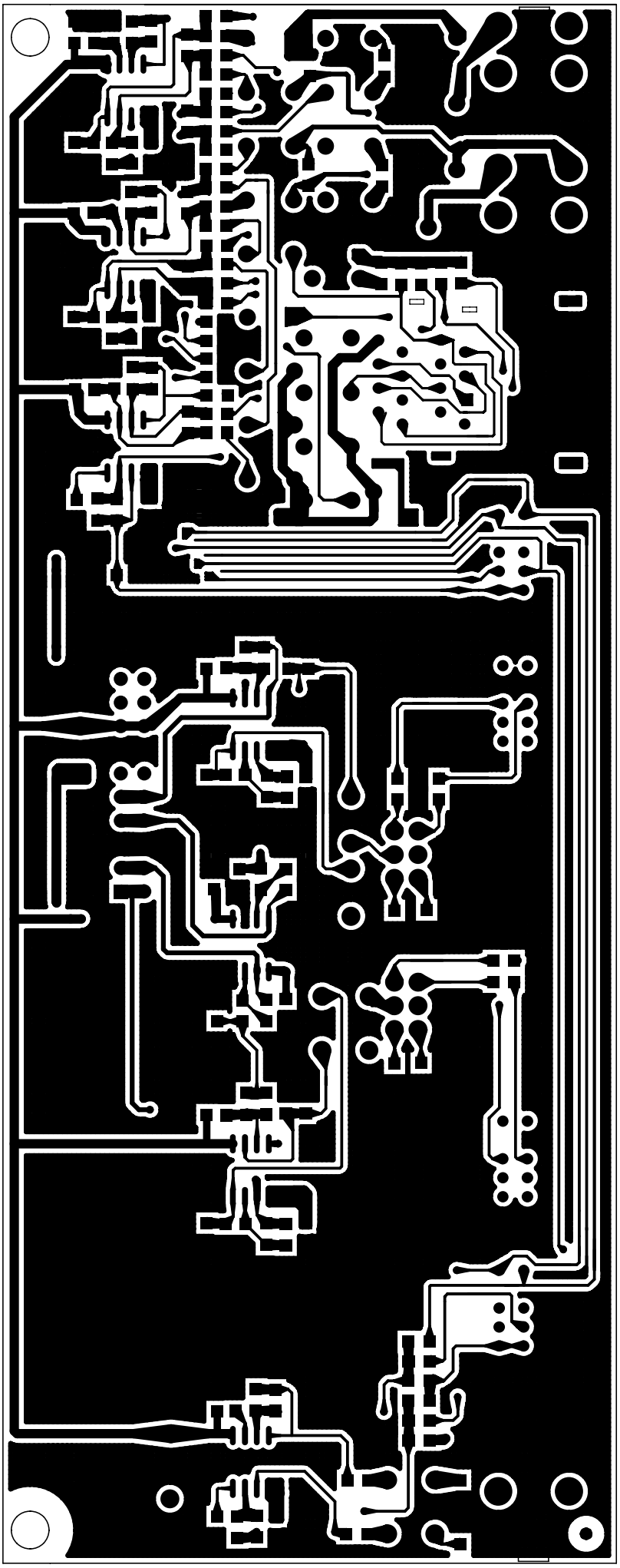
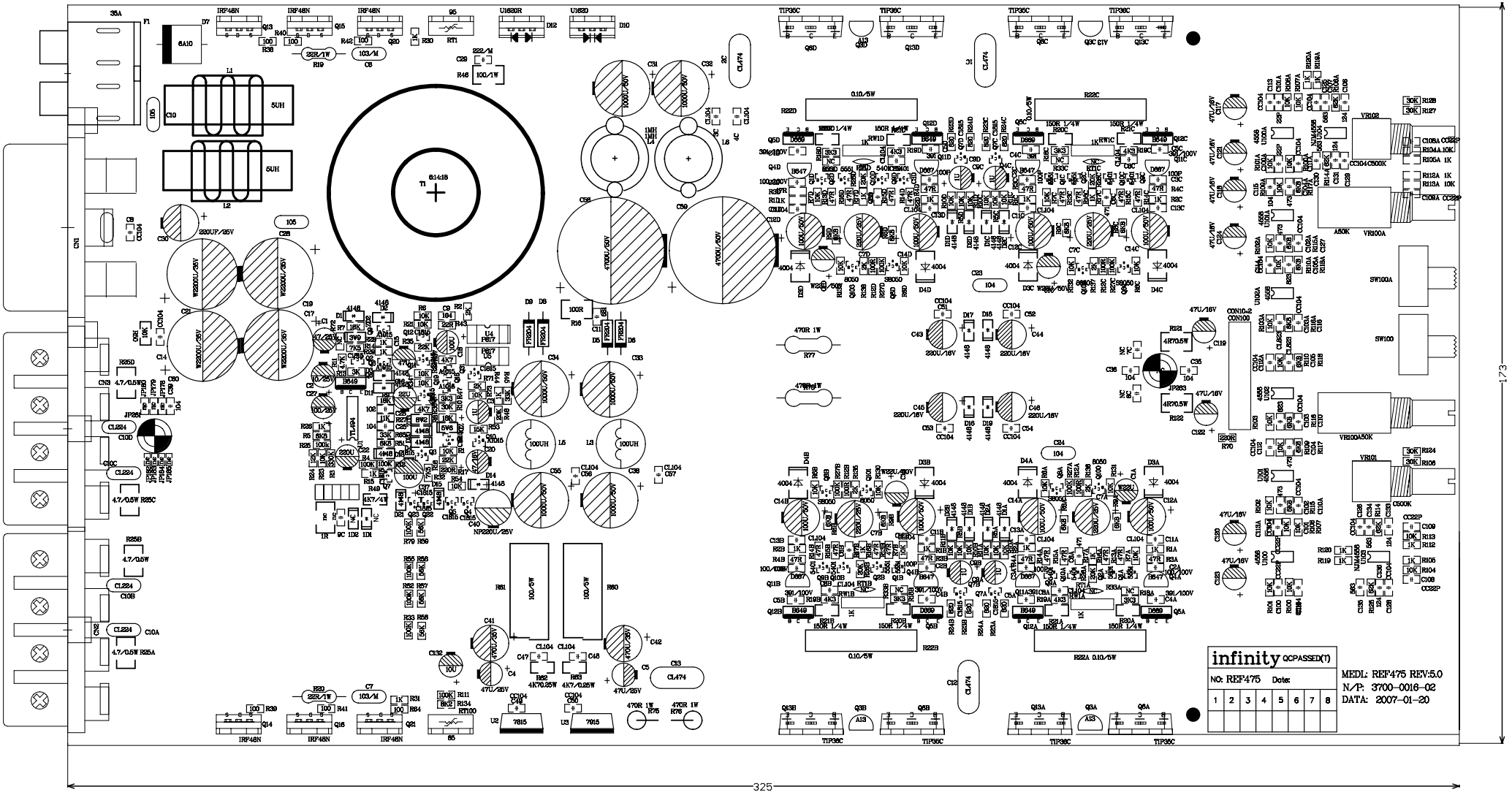
N/P: 3700-0150-02
DATA: 2007-01-20



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NO: REF475 Date:
1 2 3 4 5 6 7 8
MEDI: REF475 REV:5.0
N/P: 3700-0016-02
DATA: 2007-01-20
325
173

| REFERENCE 475a Electrical Parts List | | | | |
|---|---|---|---|---|
| | | | | |
| Part Number | Description | | Qty | Reference Designator |
| | | | | |
| **Main PCB** | | | | |
| | | | | |
| *Resistors* | | | | |
| | | | | |
| 0701-9101-02 | Resistor | SMD 100Ω 1/2W ±5% 2512 | 2 | R46 R16 |
| 0701-3103-02 | Resistor | SMD 10KΩ 1/4W ±5% 1206 | 1 | R50 |
| 0702-4220-02 | Resistor | 1W 22Ω ±5% | 2 | R20 R19 |
| 0702-4471-02 | Resistor | 1W 470Ω ±5% | 4 | R76 R75 R77 R78 |
| 0701-2220-02 | Resistor | SMD 22Ω 1/8W ±5% 0805 | 1 | R43 |
| 0701-2470-03 | Resistor | SMD 47Ω 1/8W ±1% 0805 | 24 | R16D R16C R16B R16A R15D R15C R15B R15A R14D R14C R14B R14A R13D R13C R13B R13A R4D R4C R4B R4A R3D R3C R3B |
| 0701-2101-02 | Resistor | SMD 100Ω 1/8W ±5% 0805 | 10 | R64 R42 R41 R40 R39 R38 R12D R12C R12B R12A |
| 0701-2221-03 | Resistor | SMD 220Ω 1/8W ±1% 0805 | 2 | R70 R17 |
| 0701-2102-03 | Resistor | SMD 1KΩ 1/8W ±1% 0805 | 27 | R120A R120 R119A R119 R44 R31 R30 R29 R28 R17C R17B R17A R17D R2D R2C R2B R2A R1D R1C R1B R1A R15 R26 R112A R112 |
| 0701-2821-02 | Resistor | SMD 820Ω 1/8W ±5% 0805 | 8 | R23D R23C R23B R23A R24D R24C R24B R24A |
| 0701-2202-02 | Resistor | SMD R0805 2KΩ 1/8W ±5% | 6 | R2 R71 R138 R137 R136 R135 |
| 0701-2302-02 | Resistor | SMD 3KΩ 1/8W ±5% 0805 | 1 | R13 |
| 0701-2332-03 | Resistor | SMD 3.3KΩ 1/8W ±1% 0805 | 5 | R47 R18D R18C R18B R18A |
| 0701-2432-03 | Resistor | SMD 4.3KΩ 1/8W ±1% 0805 | 4 | R19D R19A R19C R19B |
| 0701-2472-02 | Resistor | SMD 4.7KΩ 1/8W ±5% 0805 | 3 | R36 R11 R37 |
| 0701-2682-03 | Resistor | SMD 6.8KΩ 1/8W ±1% 0805 | 18 | R5 R9D R9C R9B R9A R8D R8C R8B R8A R118A R118 R117 R117A R116A R116 R115A R115 R51 |
| 0701-2822-02 | Resistor | SMD 8.2KΩ 1/8W ±5% 0805 | 1 | R134 |
| 0701-2103-02 | Resistor | SMD 10KΩ 1/8W ±5% 0805 | 52 | R23 R133 R132 R131 R130 R113A R113 R110A R110 R109A R109 R108A R108 R107A R107 R104A R104 R103A R103 R102A R102 R101A R101 R100A R100 R73 R54 R34 R22 R21 R11D R11C R11B R11A R10D R10C R10B R10A R7D R7C R7B R7A R6D R6C R6B R6A R5D R5C R5B R5A R1 R6 |
| 0701-2203-03 | Resistor | SMD 20KΩ 1/8W ±1% 0805 | 5 | R26D R26C R26B R26A R48 |
| 0701-2153-02 | Resistor | SMD 15KΩ 1/8W ±5% 0805 | 1 | R53 |
| 0701-2183-02 | Resistor | SMD 18KΩ 1/8W ±5% 0805 | 3 | R7 R9 R8 |
| 0701-2223-02 | Resistor | SMD 22KΩ 1/8W ±5% 0805 | 2 | R35 R18 |
| 0701-2303-03 | Resistor | SMD 30K 1/8W ±1% 0805 | 5 | R128 R127 R124 R106 R10 |
| 0701-2334-02 | Resistor | SMD 330KΩ 1/8W ±5% 0805 | 1 | R3 |
| 0701-2333-02 | Resistor | SMD 33KΩ 1/8W ±5% 0805 | 2 | R45 R65 |
| 0701-2113-02 | Resistor | SMD 11KΩ 1/8W ±5% 0805 | 1 | R27 |
| 0701-2123-02 | Resistor | SMD 12KΩ 1/8W ±5% 0805 | 1 | R24 |
| 0701-2623-03 | Resistor | SMD 62KΩ 1/8W ±1% 0805 | 4 | R125 R114A R114 R106A |
| 0701-2104-02 | Resistor | SMD 100KΩ 1/8W ±5% 0805 | 12 | R25 R111 R12 R4 R27D R27C R27B R27A R33 R52 R55 R79 |
| 0701-3151-02 | Resistor | SMD 150Ω 1/4W ±5% 1206 | 8 | R21D R21C R21B R21A R20D R20C R20B R20A |
| 0701-3472-02 | Resistor | SMD 1/4W 4.7KΩ ±5% 1206 | 3 | R63 R62 R49 |
| 0701-54R7-02 | Resistor | SMD 4.7Ω 1/2W ±5% 2512 | 6 | R25D R25C R25B R25A R122 R121 |
| 0706-5101-02 | Resistor | 5W 100Ω ±5% | 2 | R61 R60 |
| 0705-50R1-06 | Resistor | 5W 0.1Ω*2 ±5% 26*5*18MM | 4 | R22D R22C R22B R22A |
| 1201-1021-03 | Variable Resistor | 1kΩ | 4 | RW1D RW1C RW1B RW1A |
| 0701-2752-02 | Resistor | SMD 7.5KΩ 1/8W ±5% 0805 | 2 | R14 R32 |

| Part Number | Description | | Qty | Reference Designator |
|---|---|---|---|---|
| | | | | |
| **Main PCB** | | | | |
| | | | | |
| 0701-2563-02 | Resistor | SMD 56KΩ 1/8W ±5% 0805 | 4 | R59 R58 R57 R56 |
| 1204-5031-18 | Variable Resistor | A50K R0971G2B W=5 L=15MM T=7.5MM M=1MM FREQ | 2 | VR100A VR100 |
| 1204-5040-01 | Variable Resistor | C500K L=15mm ±10% BASS BOOST | 2 | VR101 VR102 |
| | | | | |
| *Capacitors* | | | | |
| | | | | |
| 06S123917000 | Ceramic Capacitor | SMD 390PF/100V 0805 X7R ±10% | 8 | C5D C5C C5B C5A C4D C4C C4B C4A |
| 06S321026000 | Ceramic Capacitor | SMD 1000pF/50V 0805 NPO ±5% | 1 | C26 |
| 06S122226000 | Ceramic Capacitor | SMD 2200pF/50V 0805 X7R ±10% | 1 | C29 |
| 06S121017000 | Ceramic Capacitor | SMD 100PF/100V 0805 X7R ±10% | 8 | C3D C3C C3B C3A C2D C2C C2B C2A |
| 06S322206000 | Ceramic Capacitor | SMD 22pF/50V 0805 NPO ±5% | 8 | C109A C109 C108A C108 C101A C101 C100A C100 |
| 06D3C2247701 | Ceramic Capacitor | 224/100V ±5% | 4 | C10D C10C C10B C10A |
| 06S121046000 | Ceramic Capacitor | SMD 0.1uF/50V 0805 X7R ±10% | 37 | 3C 4C C25 C36 C35 C129 C128 C127 C126 C125 C116 C115 C114 C113A C112A C112 C111A C111 C110A C110 C54 C53 C52 C51 C50 C49 C39 C14 C9 C8 C8D C8C C8B C8A |
| 06S121047000 | Ceramic Capacitor | SMD 104/100V 0805 X7R ±10% | 10 | C57 C56 C13D C13C C13B C13A C11D C11C C11B C11A |
| 06S128236001 | Ceramic Capacitor | SMD 823/50V ±10% X7R 0805 | 4 | C105A C105 C103A C103 |
| 06S124736000 | Ceramic Capacitor | SMD 0.047uF/50V 0805 X7R ±10% | 4 | C104A C104 C102A C102 |
| 06D324747700 | Ceramic Capacitor | 474J/100V 5*11MM ±5% | 4 | 2C 1C C13 C12 |
| 06D321037200 | Ceramic Capacitor | 103/100V ±5% | 2 | C7 C6 |
| 06D321056200 | Ceramic Capacitor | 105/50V ±5% | 2 | C10 C28 |
| 06D212274002 | CAP Electro | 220UF/25V ±20% | 1 | C30 |
| 06D211086100 | CAP Electro | 1000UF/50V Φ12.5*25MM 105℃ ±20% | 6 | C32 C31 C55 C38 C34 C33 |
| 06D211073116 | CAP Electro | 100UF/16V±20% 5*11 105℃ | 1 | C18 |
| 06D211056001 | CAP Electro | 1UF/50V ±20% 5*11 105℃ | 5 | C9D C9C C9B C9A C3 |
| 06D212263001 | CAP Electro | 22UF/16V ±20% 5*11 105°C | 1 | C16 |
| 06D214764102 | CAP Electro | 47uF/25V ±20% 5*11 105℃ | 3 | C1 C5 C4 |
| 06D214763109 | CAP Electro | 47uF/16V ±20% 5*11 105℃ | 10 | C124 C123 C122 C121 C120 C119 C118 C117 C15 C20 |
| 06D211074100 | CAP Electro | 100uF/25V ±20% 6.3*11 105℃ | 2 | C27 C37 |
| 06D211076100 | CAP Electro | 100uF/50V ±20% 6.3*11 105℃ | 8 | C14D C14C C14B C14A C12D C12C C12B C12A |
| 06D212264103 | CAP Electro | 220uF/25V ±20% 8*12 105℃ | 4 | C7D C7B C7A C7C |
| 06D212273002 | CAP Electro | 220UF/16V ±20% 6.3*11 105℃ | 5 | C46 C45 C44 C43 C22 |
| 06D211066109 | CAP Electro | 10uF/50V ±20% 5*11 105℃ | 1 | C132 |
| 06D211064100 | CAP Electro | 10uF/25V ±20% 5*11 105℃ | 1 | C2 |
| 06D214786101 | CAP Electro | 4700UF/50V ±20% φ25*30mm | 2 | C59 C58 |
| 06D202274100 | CAP Electro | 220uF/25V ±20% 8*12 105℃ | 1 | C40 |
| 06D214775101 | CAP Electro | 470UF/35V ±20% Φ8*20MM 105℃ | 2 | C42 C41 |
| 06D212285101 | CAP Electro | 2200UF/35V Φ16*26MM ±20% 105℃ | 4 | C60 C21 C19 C17 |
| 06D212266010 | CAP Electro | 22uF/50V ±20% 5*11 105℃ | 4 | C1C C1D C1B C1A |
| 06S125636000 | Ceramic Capacitor | SMD 563PF/50V 0805 X7R ±10% | 4 | C135 C134 C130 C107 |
| 06S121244000 | Ceramic Capacitor | SMD 0.12UF/25V 0805 X7R ±10% | 4 | C136 C133 C131 C106 |
| 06S126816000 | Ceramic Capacitor | SMD 680PF/50V ±10% X7R 0805 | 1 | C11 |
| 06S124716000 | Ceramic Capacitor | SMD 470pF/50V 0805 X7R ±10% | 4 | C6D C6C C6B C6A |
| 06D231047000 | Ceramic Capacitor | 0.1uF/100V ±20% | 2 | C23 C24 |
| | | | | |
| *Semiconductors* | | | | |
| | | | | |
| 04GS-R204-00 | Diode | FR204 2A 400V 52MM | 4 | D9 D8 D6 D5 |

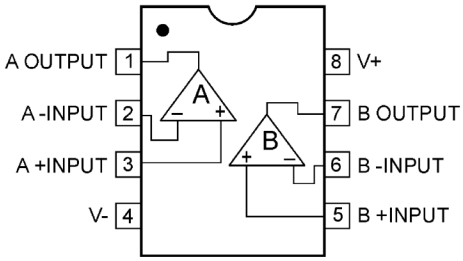
| Part Number | Description | | Qty | Reference Designator |
|---|---|---|---|---|
| | | | | |
| **Main PCB** | | | | |
| | | | | |
| 04PT-4148-01 | Diode | SMD 1N4148 DO-213AA | 22 | D20 D19 D18 D17 D16 D15 D14 D13 D11 D4 D3 D2 D2D D2C D2B D2A D1D D1C D1B D1A D1 D21 |
| 04WY-213A-00 | Diode | 5.25V | 1 | ZD1 |
| 04WY-39AV101 | Diode | SMD 3.9V DO-213AA 0.5W | 1 | ZD2 |
| 04ZL-6A10-00 | Diode | 6A10 1000V | 1 | D7 |
| 04WY-82AV101 | Diode | SMD 8.2V DO-213AA 0.5W | 1 | ZD3 |
| 04ZL-4004-02 | Diode | SMD FM4004 DO-214AC | 8 | D4D D4C D4B D4A D3D D3C D3B D3A |
| 03N1-667A-01 | Transistor | 2SD667AC 1A 120V 0.9W NPN TO-92 | 4 | Q11C Q11B Q11A Q11D |
| 03N1-8050-04 | Transistor | SMD 8050D NPN SOT-23 | 9 | Q23 Q8D Q8C Q8B Q8A Q103 Q102 Q101 Q100 |
| 03N1-5551-04 | Transistor | SMD MMBT5551LT1 NPN SOT-23 | 8 | Q2D Q2C Q2B Q2A Q1D Q1C Q1B Q1A |
| 03P1-5401-04 | Transistor | SMD MMBT5401LT1 PNP SOT-23 | 8 | Q10D Q10C Q10B Q10A Q9D Q9C Q9B Q9A |
| 03P1-1015-04 | Transistor | SMD 2SA1015 SOT-23 PNP | 5 | Q19 Q18 Q10 Q9 Q8 |
| 03N1-SA13-01 | Transistor | MPSA13 0.5A 30V NPN TO-92 | 4 | Q3D Q3C Q3B Q3A |
| 03P1-B649-07 | Transistor | 2SB649A 1.5A 180V 20W PNP TO-126 | 5 | Q12D Q12C Q12B Q12A Q6 |
| 03N1-1815-04 | Transistor | SMD 2SC1815 SOT-23 NPN | 15 | Q17 Q12 Q11 Q7D Q7C Q7B Q7A Q5 Q4 Q3 Q2 Q1 Q31 Q7 Q22 |
| 03N1-669A-07 | Transistor | 2SD669A NPN TO-126 | 4 | Q5D Q5C Q5B Q5A |
| 03T1-Z48N-02 | MOS Transistor | IRFZ48N TO-220 | 6 | Q21 Q20 Q16 Q15 Q14 Q13 |
| 03P1-B647-01 | Transistor | 2SB647 1A 120V 0.9W PNP TO-92 | 4 | Q4C Q4B Q4A Q4D |
| 03N1-35CW-26 | Transistor | TIP35CW NPN T0-247 | 4 | Q6D Q6C Q6B Q6A |
| 03P1-36CW-26 | Transistor | TIP36CW PNP T0-247 | 4 | Q13D Q13C Q13B Q13A |
| 01TI-L494-09 | IC | SMD TL494C SO-16 PWM | 1 | U1 |
| 2601-P817-00 | Optocoupler | PC817 4 | 2 | U4 U5 |
| 2202-1620-05 | Rectifier | MUR1620CTA KAD 16A/200V TO-220 | 1 | D10 |
| 2202-1602-05 | Rectifier | UF1602CT AKA 16/200V TO-220 | 1 | D12 |
| 01FA-7815-04 | Regulator | KA7815E TO-220 FAIRCHILD | 1 | U2 |
| 01FA-7915-04 | Regulator | KA7915 TO-220 FAIRCHILD | 1 | U3 |
| 01JR-4558-09 | Dual Op-Amp | SMD NJM4558 SO-8 | 8 | U104 U103 U102 U102A U101A U101 U100A U100 |
| | | | | |
| *Miscellaneous* | | | | |
| | | | | |
| 1001-1017-10 | Inductor | 12 100UH φ0.8 | 1 | L5 |
| 1001-4760-10 | Inductor | 1mh 15A | 1 | L6 |
| 1500-0400-01 | Terminal | JSZ4-32 | 2 | CN3 CN2 |
| 1500-0300-01 | Terminal | JSZ3-31 | 1 | CN1 |
| 1502-0504-00 | Jack | DIP Pitch 2.0MM 5PIN Bend 90 degree | 1 | CN5 |
| 1401-0001-04 | Fuse holder | BXS-03 4PIN | 1 | for F1 |
| 1601-353G-00 | Fuse | 35A/32V | 4 | F1 |
| 3000-INIT-01 | HF transformer | φ47 6：14：18 L1=L2=φ1.0*6*6TS S1=S2=φ0.8*6*14TS S3=S4=φ1.2*1*18 | 1 | T1 |
| 1380-0208-00 | Temperature Switch | 95℃ TO-220 | 1 | RT1 |
| 1333-0204-00 | Switch | SSH-23D04-2P3T 9MM | 2 | SW100A SW100 |
| 1005-5R04-10 | Inductor | 5UH φ23 φ1.0*5 立式 | 2 | L1 L2 |
| 1380-0203-00 | Temperature Switch | JUC-31F65℃ ±5℃ TO-220 | 1 | RT100 |
| 1400-0001-10 | Jack | 2.54 2*10PIN | 1 | CON100 |
| | | | | |
| **Input PCB** | | | | |
| | | | | |
| *Resistors* | | | | |
| | | | | |
| 0701-2000-02 | Resistor | SMD 0Ω 1/8W ±5% 0805 | 3 | R236 R228 R225 |

| Part Number | Description | | Qty | Reference Designator |
|---|---|---|---|---|
| | | | | |
| **Input PCB** | | | | |
| | | | | |
| 0701-2823-03 | Resistor | SMD 82Ω 1/8W ±1% 0805 | 4 | R232 R233 R332 R333 |
| 0701-2102-02 | Resistor | SMD 1KΩ 1/8W ±5% 0805 | 2 | R227 R226 |
| 0701-2133-02 | Resistor | SMD 13KΩ 1/8W ±5% 0805 | 10 | R315 R314 R313 R312 R245 R244 R215 R214 R213 R212 |
| 0701-2221-03 | Resistor | SMD 220Ω 1/8W ±1% 0805 | 4 | R329 R324 R229 R224 |
| 0701-2223-02 | Resistor | SMD 22KΩ 1/8W ±5% 0805 | 9 | R319 R318 R219 R218 R304 R301 R204 R201 R239 |
| 0701-2473-02 | Resistor | SMD 47KΩ 1/8W ±5% 0805 | 5 | R256 R255 R254 R248 R247 |
| 0701-2563-02 | Resistor | SMD 56KΩ 1/8W ±5% 0805 | 8 | R323 R320 R238 R237 R223 R222 R221 R220 |
| 0701-2911-03 | Resistor | SMD 910Ω 1/8W ±1% 0805 | 4 | R234 R235 R334 R335 |
| 0701-2101-03 | Resistor | SMD 100Ω 1/8W ±1% 0805 | 4 | R241 R231 R330 R331 |
| 0701-2104-02 | Resistor | SMD 100KΩ 1/8W ±5% 0805 | 2 | R217 R216 |
| 0701-2103-02 | Resistor | SMD 10KΩ 1/8W ±5% 0805 | 24 | R305 R303 R311 R309 R308 R307 R302 R300 R200 R310 R306 R246 R211 R209 R208 R207 R206 R205 R203 R202 R249 R240 R230 R210 |
| 1204-5021-05 | Variable Resistor | B5K L=15mm ±5% INPUT LEVEL | 2 | VR200 VR300 |
| 0701-2102-03 | Resistor | SMD 1KΩ 1/8W ±1% 0805 | 6 | R253 R252 R251 R250 R243 R242 |
| | | | | |
| *Capacitors* | | | | |
| | | | | |
| 06S121046000 | Ceramic Capacitor | SMD 0.1uF/50V 0805 X7R ±10% | 15 | C245 C243 C235 C234 C233 C232 C250 C249 C248 C247 C239 C238 C237 C236 EC1 |
| 06S321006000 | Ceramic Capacitor | SMD 10pF/50V 0805 NPO ±5% | 5 | C315 C314 C230 C215 C214 |
| 06S322206000 | Ceramic Capacitor | SMD 22pF/50V 0805 NPO ±5% | 3 | C210 C224 C223 |
| 06S321016000 | Ceramic Capacitor | SMD 100pF/50V 0805 NPO ±5% | 14 | C321 C320 C319 C318 C240 C231 C221 C220 C218 C325 C322 C225 C222 C219 |
| 06D112264302 | CAP Electro | 22uF/25V ±10% 5*11 105℃ | 29 | C246 C244 C242 C241 C213 C308 C309 C307 C306 C305 C304 C303 C302 C301 C300 C229 C228 C212 C211 C207 C206 C205 C204 C203 C202 C201 C200 C208 C209 |
| 06D212274001 | CAP Electro | 220UF/25V ±20% 8*12 105℃ | 4 | C316 C317 C216 C217 |
| 06S126816000 | Ceramic Capacitor | SMD 680PF/50V ±10% X7R 0805 | 4 | C327 C326 C227 C226 |
| | | | | |
| *Semiconductors* | | | | |
| | | | | |
| 0100-M833-08 | Dual Op-Amp | LM833 SOP-8 | 7 | U205 U302 U300 U201 U200 U202 U301 |
| | | | | |
| *Miscellaneous* | | | | |
| | | | | |
| 1333-0204-00 | Switch | DIP SSH-23D04-2P3T length 9MM | 4 | SW301 SW300 SW201 SW200 |
| 1400-0001-16 | terminal | DIP 16PIN RJ45 2*10P16C | 1 | CN200 |
| 1404-0004-00 | RCA jack | 4 Jacks white red golden | 1 | RCA200 |
| 1404-0003-00 | RCA jack | 5 Jacks white red golden | 1 | RCA300 |
| 1505-2009-00 | PIN | 2.54 distance 2*10PIN foot=0.65*0.6 | 1 | CON300 |
| 1003-1002-08 | Inductor | SMD 10UH CPL-0805 20MA ±20% | 1 | L302 |
| | | | | |
| **LED BOARD** | | | | |
| | | | | |
| 2004-0017-00 | LED | 3 White with blue light | 8 | LED1 LED2 LED3 LED4 LED5 LED6 LED7 LED8 |
| 2100-0034-05 | FFC | 5PIN 2.0 UL1007 28AWG L=150mm 2.0 105℃ | 1 | |
| 2000-0017-00 | LED | DIP Red with red ligth Φ3MM 2P | 1 | LED300 |
| 2004-0014-00 | LED | DIP Φ3.0MM Blue with blue light | 1 | LED100 |
| 0701-6102-02 | Resistor | SMD 1KΩ 1/2W ±5% 2010 | 2 | R1 R2 |
| | | | | |

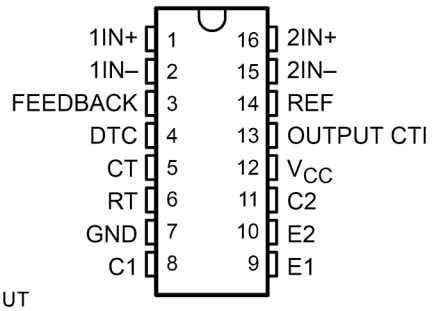
| Part Number | Description | | Qty | Reference Designator |
|---|---|---|---|---|
| | | | | |
| **LED BOARD** | | | | |
| | | | | |
| 2102-0153-02 | FFC | 2PIN UL1007 red black 28AWG L=320mm soldering 5mm | 1 | |
| 2102-0154-02 | FFC | 2PIN UL1007 red black 28AWG L=40mm slodering 5mm | 1 | |
| 1502-0504-00 | Jack | DIP Pitch 2.0MM 5PIN Bend 90 degree | 1 | CN5 |
| 06S121046000 | Capacitor | SMD 0.1uF/50V 0805 X7R ±10% | 2 | C1 C2 |
| | | | | |
| **MECHANICAL** | | | | |
| | | | | |
| LS1AY0300401 | Screw | PM3*4MM Plating black Zinc | 4 | |
| ZL-10016A-21 | Copper pole | H4.8*27MM | 2 | |
| GD-600010003 | Acylic board | 264*48*4.0mm Clear Acylic | 1 | |
| PL-B0005-000 | astigmatic paper | 264*48*0.25mm Astigmatic film+3M double glue+Alum. Foil | 1 | |
| PL-B0004-000 | Glisten paper | 264*48*0.15mm Glisten film+3M double glue | 1 | |
| ZL-10037A-15 | PCB pole | φ7*6.4+φ4.95*1.5mm | 2 | |
| JY247A22A001 | Mica | 47*22*0.1mm no hole | 4 | |
| JY297A22A001 | Mica | 97*22*0.1mm no hole | 2 | |
| ZA-H00040100 | Snap bottom | φ7.5 M3.5*4 Alum. | 4 | |
| LS1AM0250401 | Screw | Plating black Zinc 2.5*4 | 4 | |
| LS1CJ0402507 | Screw | TA4*25MM Plating Nickel | 4 | |
| XN-10500-012 | Knob | ABS-757 Black Φ10.5*9MM White arrow | 6 | |
| LS5KJ0301007 | Screw | 3*10MM Plating Nickel | 6 | |
| LS5KP0300807 | Screw | 3*8MM Plating Nickel | 8 | |
| LS1AP0300607 | Screw | 3*6MM Plating Nickel | 6 | |
| LS1AM0300607 | Screw | PM3*6 Plating Nickel | 2 | |
| KT-200012200 | CAP | White PVC for RCA | 3 | |
| KT-200021300 | CAP | Red PVC for RCA | 3 | |
| DQ8069032084 | Washer | Φ6.9*Φ3.2*0.8MM | 2 | |
| LS1AY0301201 | Screw | PM3*12MM Plating Black Zinc | 2 | |
| PL-L0007-000 | Cliper | 30*36*0.8mm | 4 | |
| PL-L0006-000 | Cliper | 30*28*0.8mm | 6 | |
| XG-0017-2601 | Bottom plate | 325*182*1.2mm, H1-144 silver painting | 1 | |
| HG-0006-2601 | Rear plate | 214*70*1.2mm, H1-144 silver painting | 1 | |
| MK-0005-2601 | Front plate | 214*70*1.2mm, H1-144 silver painting | 1 | |
| KG-100100500 | Snap bottom | T07-003-01φ11*φ14*10.8 Black ABS | 4 | |
| LS1AA0200501 | Screw | PA2*5 Black Zinc | 1 | |
| LS1FM0300011 | Screw | KM 3*6MM Black Zinc | 5 | |
| CP-B00011400 | Lens | 40*10.8*5.7mm PC cold grey10C | 1 | |
| GD-600011400 | Reflect board | 270*53.5*13mm Clear blue PC | 1 | |
| SG-0016-2601 | Top plate | 360*227*62mm die casting aluminum alloy, H1-144 silver painting | 1 | Original, see page 8 |
| SG-0001-2607 | Top plate | 360*227*62mm die casting aluminum alloy, H1-144 silver painting | 1 | Rev1, see page 8 |
| | Heatsink | 325*216*60mm extrusion, Hair with painting | 1 | |
| JD-E00020515 | cotton mate | 5*10*10MM 35degree one side with glue black | 4 | |
| JD-A01970515 | round mat | Φ5.0*2.0 Black EVA one side with glue | 12 | |

# Semiconductor Pinouts

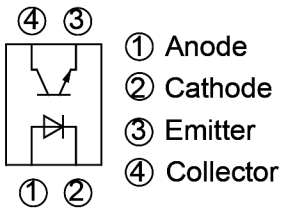
**NJM4458 Dual Op-amp**
**LM833 Dual Op-amp**
**U100-104**
**U100A-102A**
**U200-202**
**U205, U300-302**



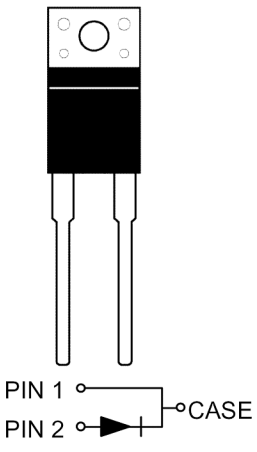

**TL494 PWM**
**U1**



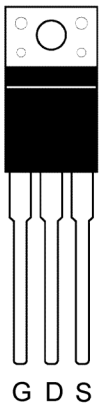

**PC817**
**U4,5**



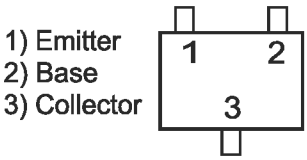

**UF1602CT**
**Rectifier**
**D12**



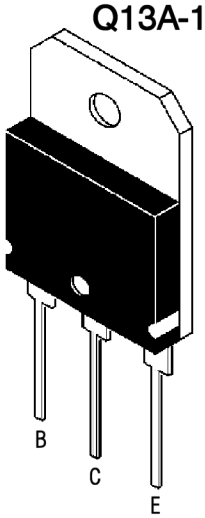

**IRFZ48N MOSFET**
**Q13-16, Q20,21**



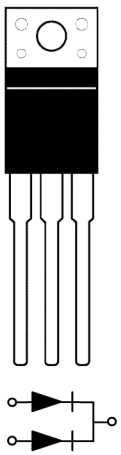

**8050D NPN**
**2SC1815 NPN**
**2SA1015 PNP**
MMBT5401 SOT23,
MMBT5551 SOT23,
Q1-5, Q7, Q7A-7D,
Q8-10,Q18,19 Q23,
Q11,12,17,22,31
Q9A-9D, Q10A-10D
Q1A-1D, Q2A-2D
Q100-103,Q8A-8D



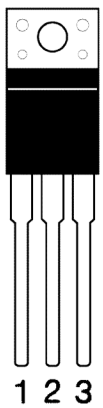

**TIP35C**
**TIP36C**
**Q6A-6D**
**Q13A-13D**




**MUR1620CT**
**Rectifier**
**D10**

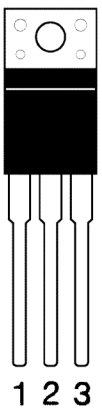


**KA7815**
**+15 REG**
**U2**



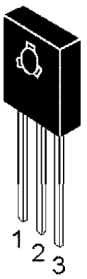

1. IN
2. GROUND
3. OUT

**KA7915**
**-15 REG**
**U3**



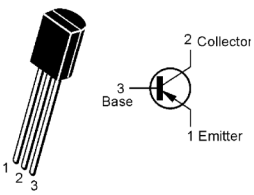

1. GROUND
2. IN
3. OUT

**2SD669A**
**2SB649A**
**Q6, Q12A-12D**
**Q5A-5D**

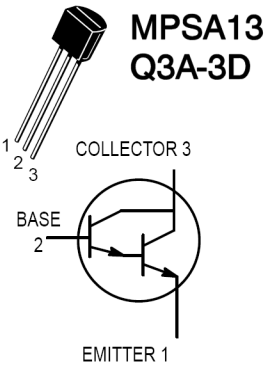


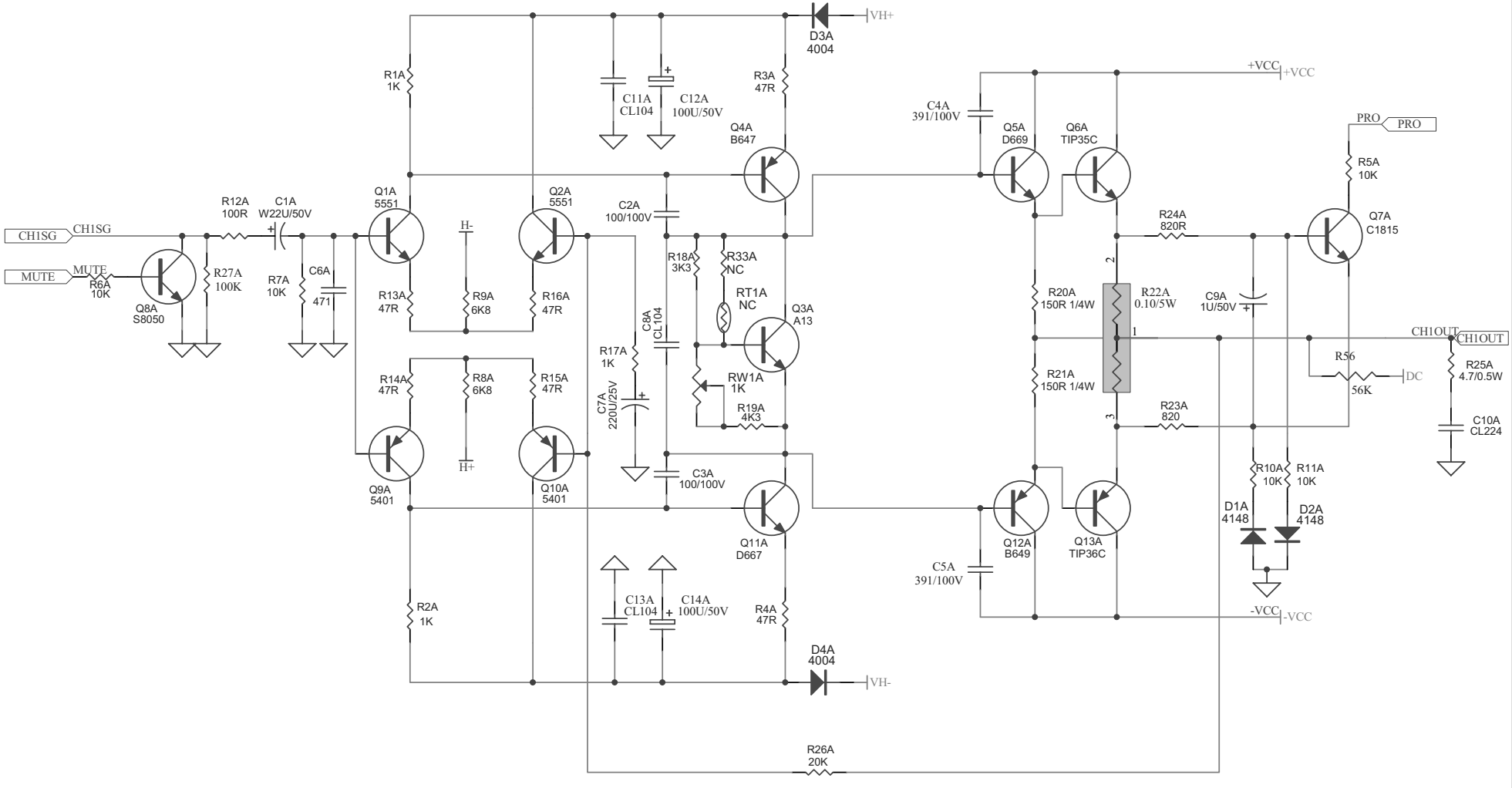

1. Emitter
2. Collector
3. Base

**2SD667A**
**2SB647A**
**Q4A-4D**
**Q11A-11D**




**MPSA13**
**Q3A-3D**






| ECN NO | DESCRIPTON | APPROVED | DATA |
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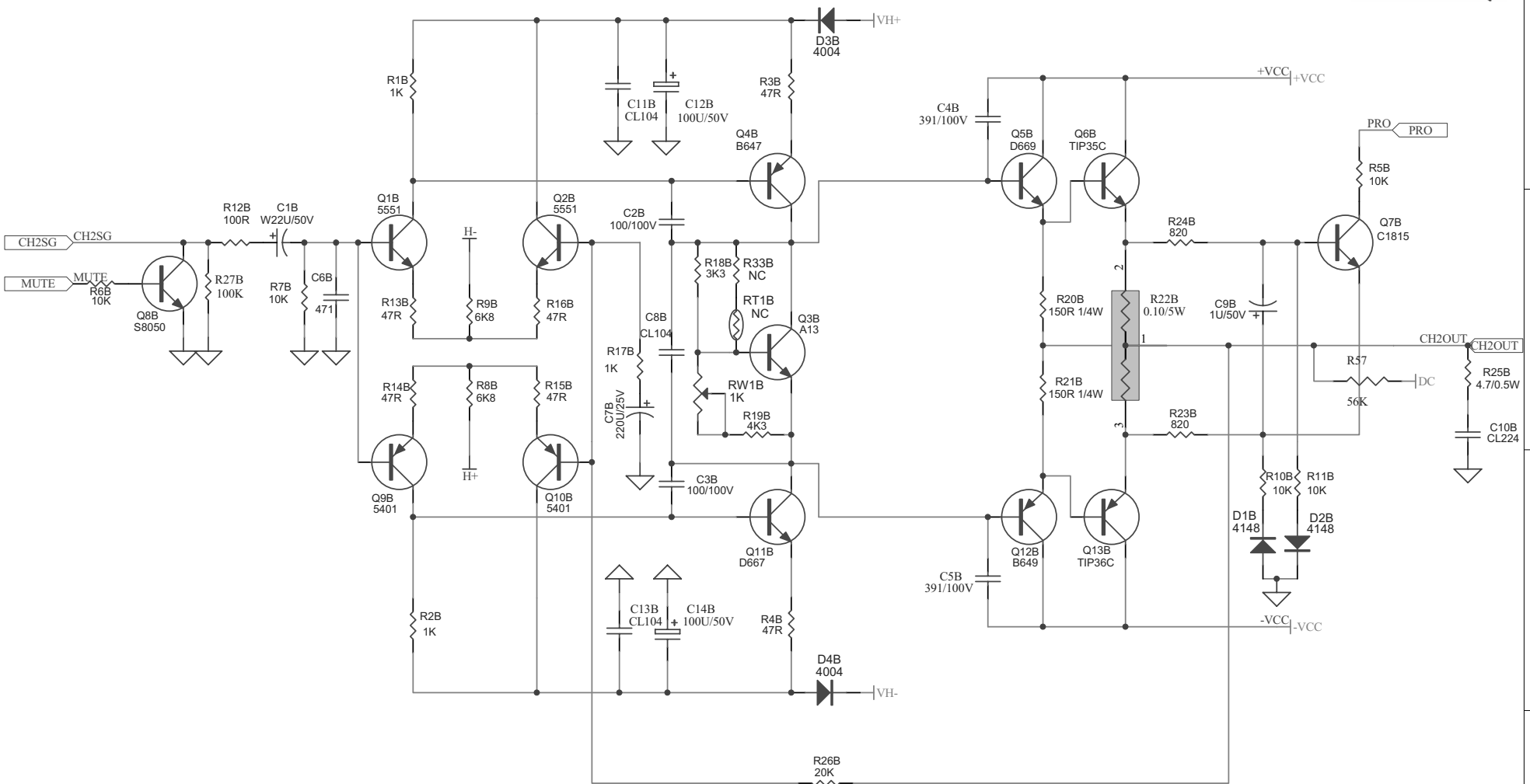
| – | | | | DW GNO: |
| | | | | PART NO: |
| PART NAME: | SCALE: 1:1 | DRAWN BY: TAN.SHI.CHUAN | | DATA: 2007.01.06 |
| AMP-1CH | UNIT: MM | CHECKED BY: | | DATA: |
| PRODUCT MODE: infinity REF-475 | SIZE: A4 | APPROVED BY: | | DATA: |
| | REV: LPP | | | |




| ECN NO | DESCRIPTON | APPROVED | DATA |
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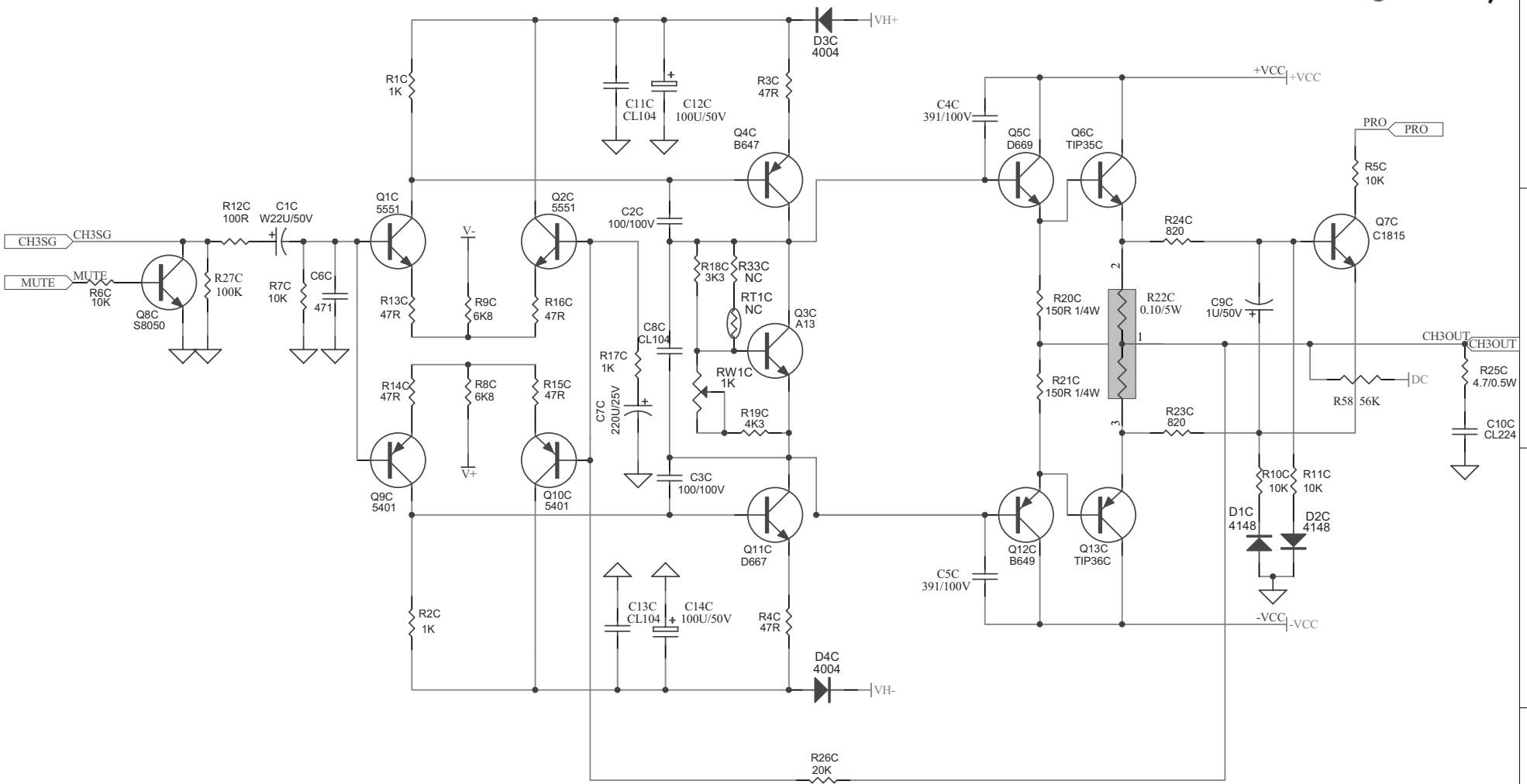
| PART NAME: AMP-2CH | SCALE: | 1:1 | DRAWN BY: TAN.SHI.CHUAN | DW GNO: |
| | | | | PART NO: |
| | UNIT: | MM | CHECKED BY: | DATA: 2007.01.06 |
| PRODUCT MODE: infinity REF-475 | SIZE: | A4 | APPROVED BY: | DATA: |
| | REV: | LPP | | DATA: |




| ECN NO | DESCRIPTON | APPROVED | DATA |
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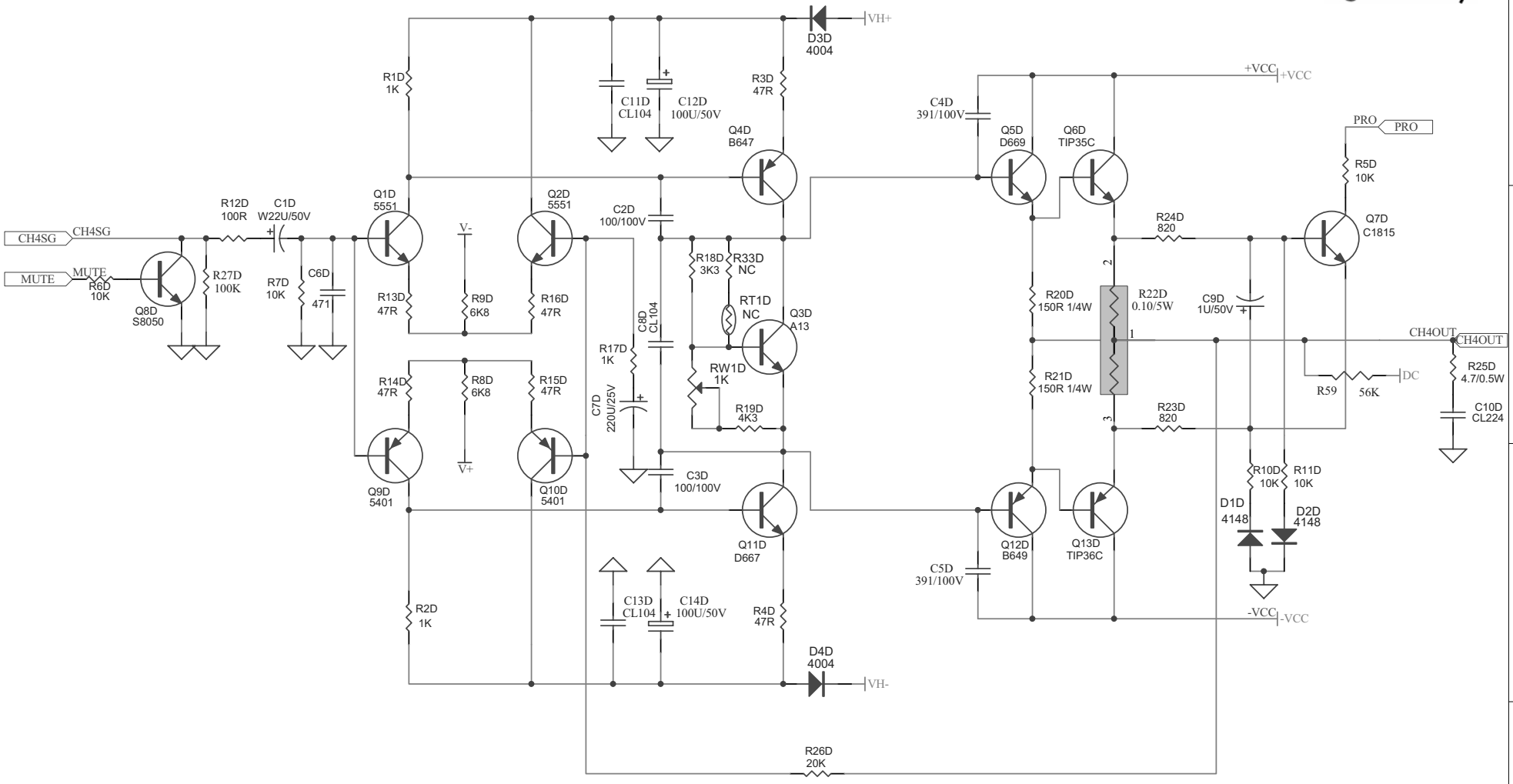
| PART NAME: AMP-3CH | SCALE: 1:1 | DRAWN BY: TAN.SHI.CHUAN | DW GNO: |
| | UNIT: MM | CHECKED BY: | PART NO: |
| PRODUCT MODE: infinity REF-475 | SIZE: A4 | APPROVED BY: | DATA: 2007.01.06 |
| | REV: LPP | | DATA: |
| | | | DATA: |

# 475a Reference Series




| ECN NO | DESCRIPTON | APPROVED | DATA |
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| | | | | DW GNO: |
| | | | | PART NO: |
| PART NAME: AMP-4CH | SCALE: | 1:1 | DRAWN BY: TAN.SHI.CHUAN | DATA: 2007.01.06 |
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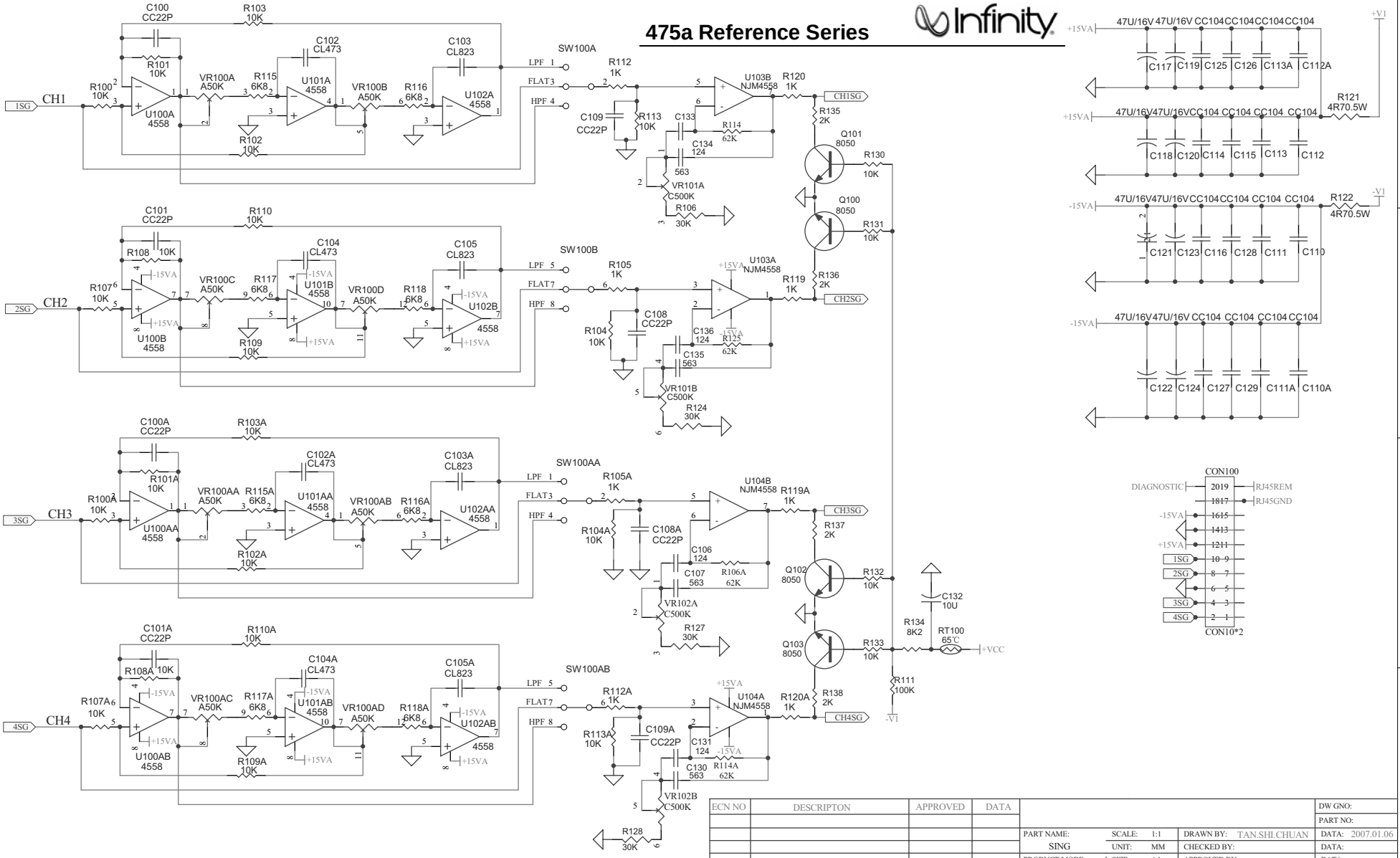
# 475a Reference Series

Infinity

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| PART NAME: | SCALE: | 1:1 | DRAWN BY: TAN.SHI.CHUAN | | DATA: 2007.01.06 |
| SING | UNIT: | MM | CHECKED BY: | | DATA: |
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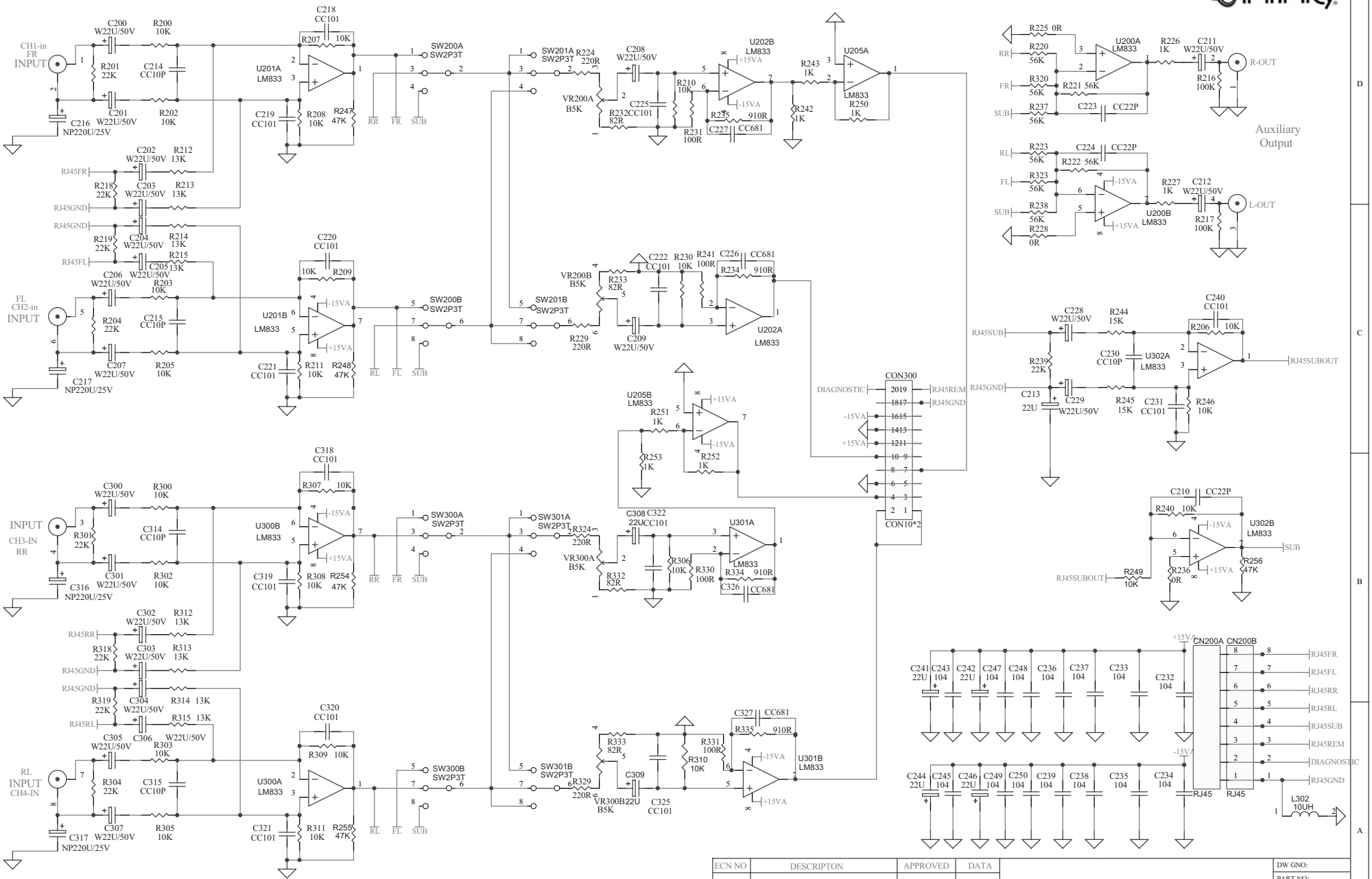
# 475a Reference Series




| ECN NO | DESCRIPTON | APPROVED | DATA |
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| | | | DW GNO: |
| | | | PART NO: |
| PART NAME: SING-1CH-2CH | SCALE: 1:1 | DRAWN BY: TAN.SHI.CHUAN | DATA: 2007.01.06 |
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| PRODUCT MODE: infinity REF-475 | SIZE: A4 | APPROVED BY: | DATA: |
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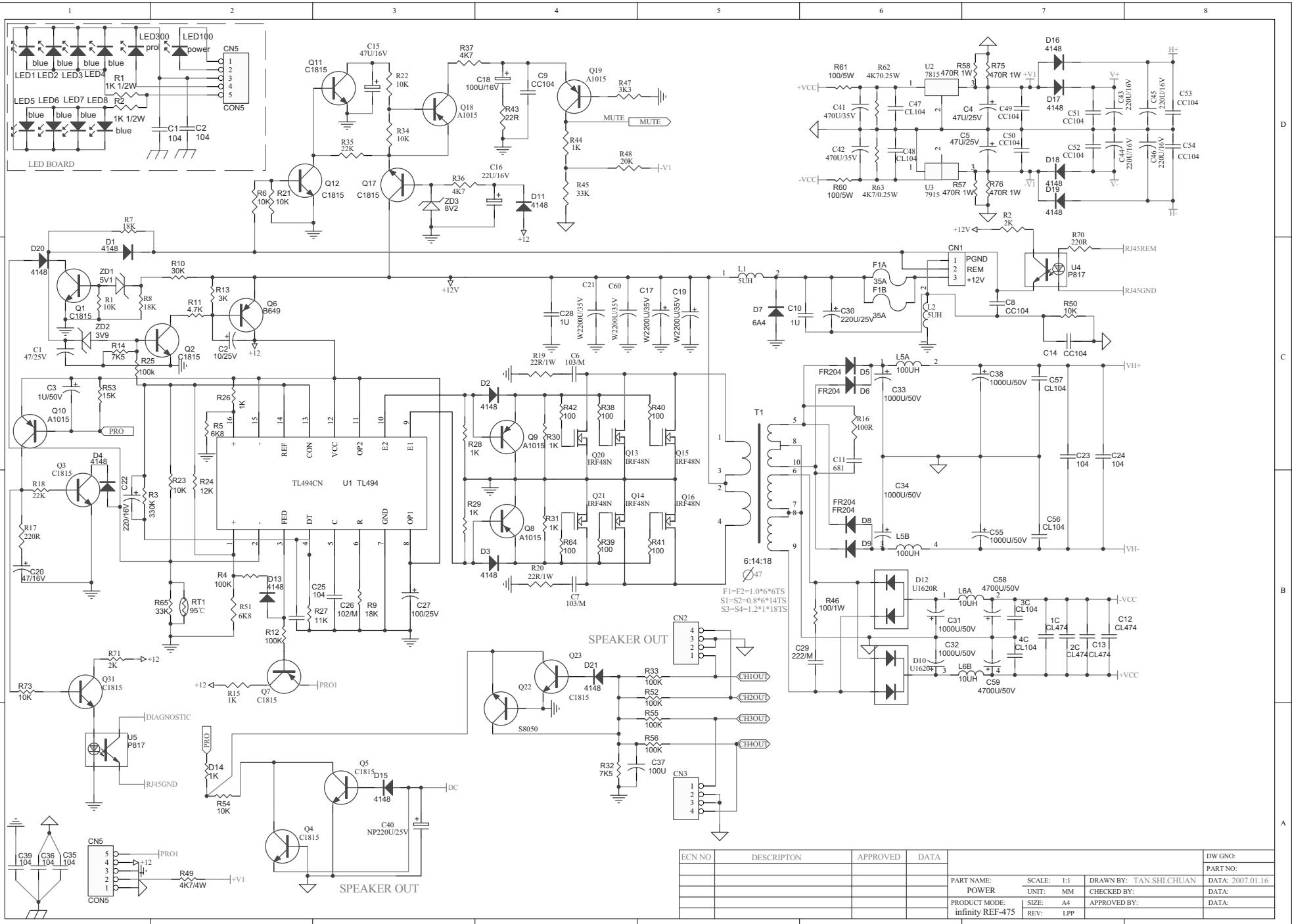


| ECN NO | DESCRIPTON | APPROVED | DATA | | | | DW GNO: |
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| | | | | | | | PART NO: |
| | | | | PART NAME: POWER | SCALE: 1:1 | DRAWN BY: TAN.SHI.CHUAN | DATA: 2007.01.16 |
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