

Citation 12 MOSFET Power Amplifier User Manual

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INTRODUCTION

The design of this MOSFET power amplifier is referenced to the circuit design of Harman-Kardon Citation 12 amplifier. The values are modified according the suggested values by Nelson Pass. Each channel is capable to delivery 75W@8ohm and 150W@4ohm power to the speaker. The power can be supplied either by AC or DC. Testing points are added. The output current can be set by a resistor trimmer.

FEATURES

- Design reference to the Harman-Kardon Citation 12 classic power amplifier circuit as blueprint and circuit modified as reference to Nelson Pass
- Maximum output power can reach 75W@8 ohm or 150W@4ohm loading
- High precise **MOSFET IRFP240**
- Built-in voltage regulating circuitry and array of reservoir capacitors for power filtering.
- Output current is set by a resistor trimmer.
- Protection is done by testing connectors.
- Power requirements: two 27-33V AC or DC (5A)
- PCB dimension: [10mm x 14mm, 2.4mm thickness and 2oz copper](#)
- [Two mono sets are required for stereo.](#)

PRECAUTIONS

- Use a power transformer with fuse (6A) socket to limit the supply current in case of short circuit or incorrect assembly.
- Double check the assembled components with the schematics.
- Turn off the power supply if you observe any smokes or hear strange sound coming out from the transformer or board. If there is short circuit, the transformer will be getting very hot shortly.

PROCEDURES

- Assembly all the components according to the schematic and part list. Notice the polarity of the electrolytic capacitors. There are no polarity of the thin film capacitors.
- Open the bypass jumper J3, J4, J12 and J13 before switching on the power.
- Apply two 27-33V AC to J1 and J2. ~33V DC is obtained for the filtering capacitor C1, C3, C5, C7, C9 and C11 and ~33V DC is obtained for the capacitors C2, C4, C6, C8, C10 and C12. This step is to ensure the power supply unit work properly.
- Remove the power supply and discharge the capacitors (short by a 10ohm/2W resistor to ground). Open the bypass jumper J3 and J4 and short the J12 and J13 by wires, power supply is now in series with the 10ohm/2W resistor to limit its maximum current supply to the circuit in case of any components burnt out (This step is very important!). Also, a large heat sink is required to drain out the heat generated by two power MOSFET. In this case, the MOSFET is very hot, do not use finger to touch it!
- The R16 and R21 are used to measure the biasing current of the output stage (high biasing current means high output driving current and hence higher the output power). At the beginning, the resistor trimmer RV1 is set so that the biasing current is as small as possible to prevent burnt out of the MOSFETs due to high current (turn it until it reach the most anti-clockwise position)
- Turn on the power supply. Disconnect the power supply when you see any smokes, lighting or smell any burnt. Ensure the resistor trimmer is set in the correct position.
- Measure the voltage across the 10/2W resistors (J3 and J4), the biasing current can be calculated by the following equation:

$$I = V / R = V/10$$

Gradually turning the resistor trimmer VR1 until the biasing current I reach to 75mA - 100mA (V=1V). Again, higher biasing current, higher output power, but I=75mA is suggested. (Disconnect the power supply if see there is any smokes)

- Short J3, J4, J12 and J13 by wires
- Enjoy it.

CHECKLIST

If you have any questions on assembly, please contact us by email tech@analogmetric.com



