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Tosuny Tosunyr6m78us3db

Tosuny 45W 40dB SSB Linear HF/FM/CW/Ham Power Amplifier DIY Kit Instruction Manual

Model: Tosunyr6m78us3db

1. Introduction

This manual provides detailed instructions for the assembly, operation, and maintenance of the Tosuny 45W 40dB SSB Linear HF/FM/CW/Ham Power Amplifier DIY Kit. This kit is designed for DIY enthusiasts and is commonly used in SSB, AM linear power amplifier, CW, FM, and basic signal amplification applications.
Please read this manual thoroughly before beginning assembly or operation to ensure correct usage and optimal performance.

2. Safety Information

Always observe the following safety precautions:

- Ensure the power supply is disconnected before assembly or maintenance.
- Use appropriate tools and follow all assembly steps carefully.
- Avoid touching components when the device is powered on, especially high-voltage areas.
- This kit requires soldering. Exercise caution when using soldering irons and ensure adequate ventilation.
- Do not exceed the specified input voltage (DC 13.8V).
- Proper heat dissipation is crucial. A heat sink is not included and must be added by the user.

3. Package Contents

The Tosuny 45W 40dB SSB Linear HF/FM/CW/Ham Power Amplifier is shipped as a DIY kit. Please verify that all components are present before starting assembly.



Image: All components of the Tosuny Power Amplifier DIY Kit, including the PCB, resistors, capacitors, transistors, and inductors, laid out for assembly.

The package includes:

- 1 x Power Amplifier DIY Kit (unassembled components)
- Printed Circuit Board (PCB)
- Various electronic components (resistors, capacitors, transistors, inductors, connectors, etc.)

Note: Radiators (heat sinks) are NOT included and must be sourced separately by the user for proper operation and heat dissipation.

4. Product Features

- **Application:** Suitable for SSB, AM linear power amplifier, CW, FM, and general signal amplification.
- **Ease of Use:** Designed for easy installation and operation once assembled.

- **Performance:** Features low noise and high-cost performance, ideal for DIY enthusiasts.
- **Gain:** Overall gain exceeds 40 dB (10,000 times amplification).
- **DIY Kit:** Provided as components for self-assembly.

5. Specifications

Parameter	Value
Input Power	1-5 mW
Output Power (Maximum)	45 W
Input Voltage	DC 13.8V (10A or more)
Maximum Output Power (without heat sink)	57 W
Output Impedance	50 ohms (adjustable 10-200 ohms)
Input Frequency Range	-30 MHz (HF channel)
Input/Output Interface	Standard SMA interface, external threaded hole
Weight	Approx. 62g
Dimensions (L x W x H)	10.1 x 6.1 x 0.2 cm
Model Number	Tosunyr6m78us3db
GTIN/UPC	738674581562

Output Power by Frequency:

- 3.500 MHz: 54W
- 7.050 MHz: 56W
- 10.000 MHz: 57W
- 14.270 MHz: 55W
- 21.400 MHz: 41W
- 24.000 MHz: 37W
- 28.100 MHz: 25W
- 29.600 MHz: 20W

6. Assembly Instructions

This product is a DIY kit and requires assembly. Basic soldering skills and tools are necessary. Refer to the provided circuit diagram and component layout for guidance.

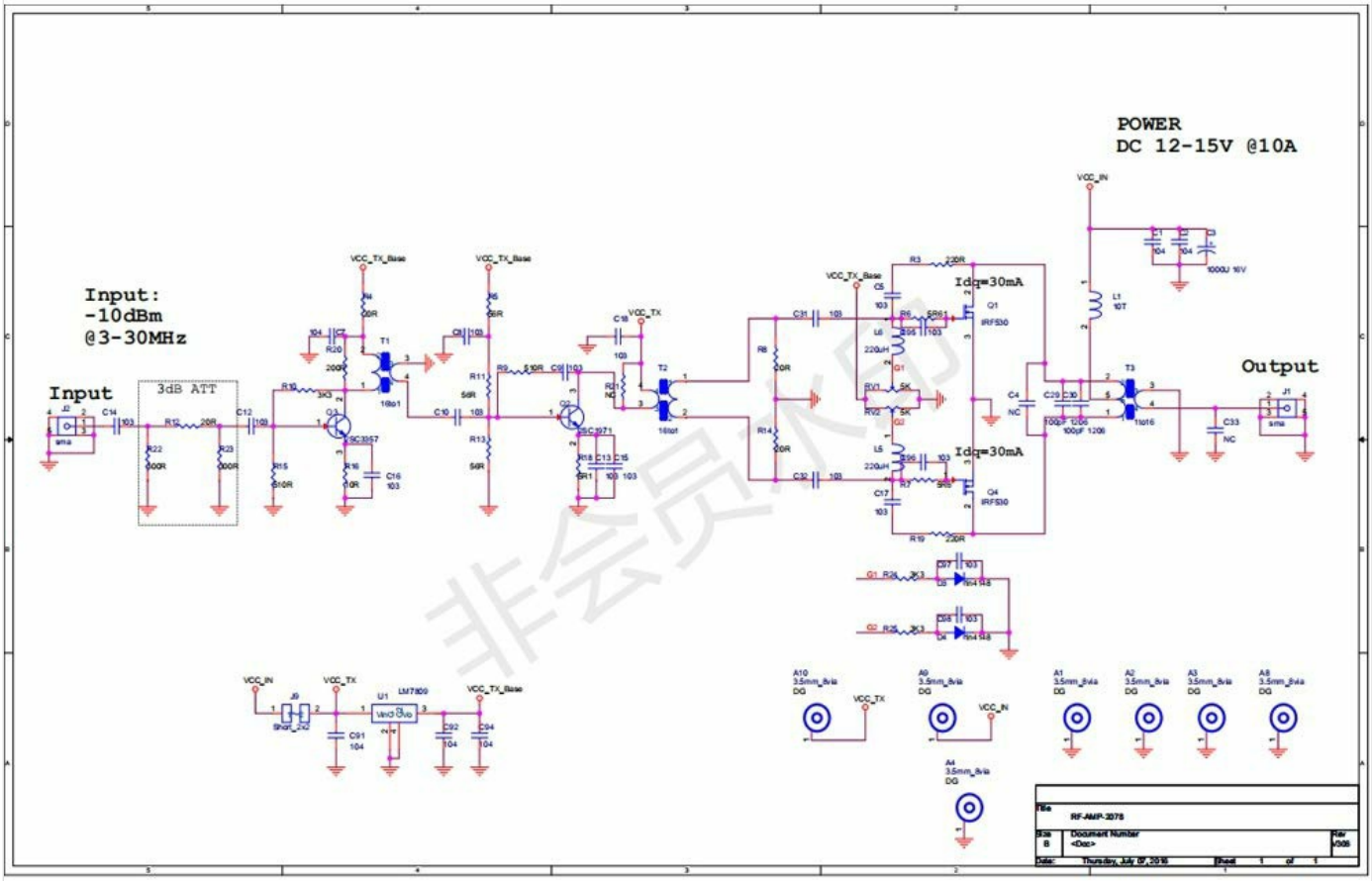


Image: Detailed circuit diagram illustrating the connections and components of the power amplifier.

1. **Component Identification:** Before starting, identify all components against the parts list and the circuit diagram.
2. **Solder Smallest Components First:** Begin by soldering the smallest components (resistors, diodes) to the PCB, followed by larger components (capacitors, inductors, transistors, connectors).
3. **Transistor Installation:** Pay close attention to the orientation and pinout of transistors. Incorrect installation can damage the device. Verify the pinout against the component datasheet before soldering.
4. **Inductor Winding:** If any inductors require winding, follow the instructions carefully for the correct number of turns and wire gauge.
5. **SMA Connectors:** Solder the SMA input (RF IN) and output (RF OUT) connectors securely.
6. **Power Connection Points:** Ensure the VCC_PA (13.8V) and ground connections are robustly soldered.
7. **Heat Sink Installation:** After assembling the electronic components, attach an appropriate heat sink to the power transistors. This is critical for preventing overheating and ensuring stable operation.

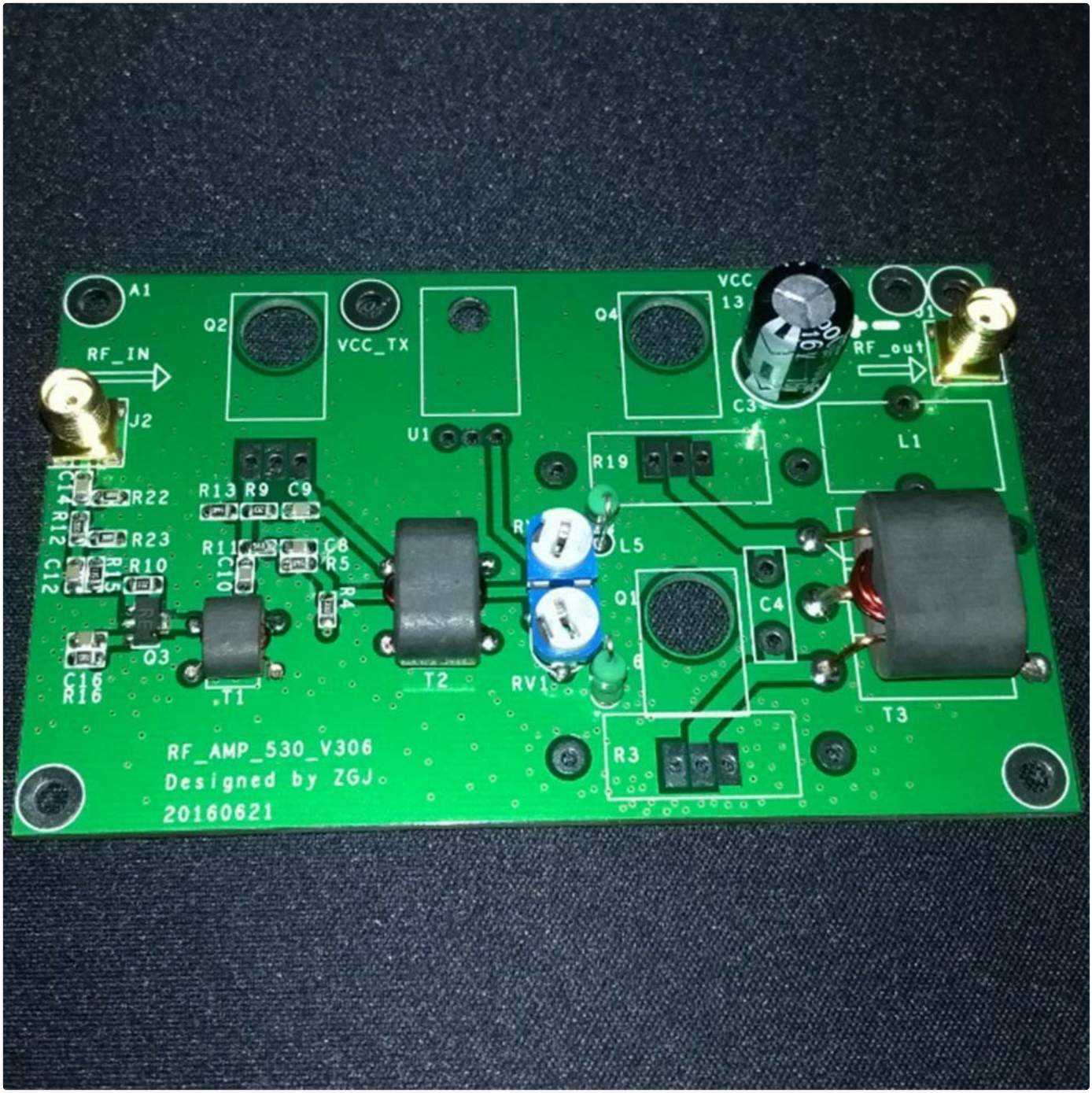


Image: A fully assembled Printed Circuit Board (PCB) of the power amplifier, showing soldered components and SMA connectors for RF input and output.

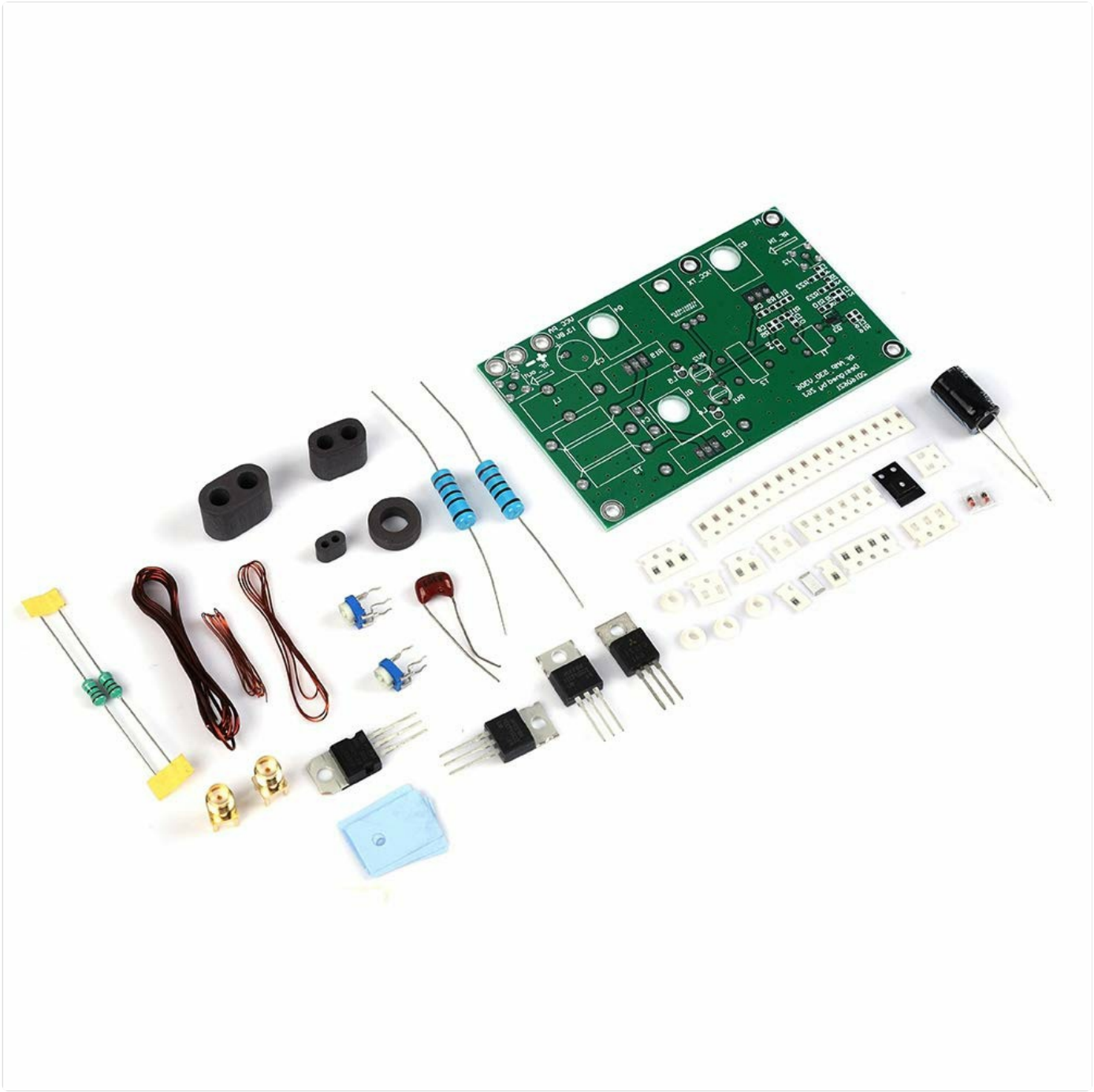


Image: Top-down view of the assembled power amplifier PCB, highlighting component placement and traces.

7. Operating Instructions

Once the amplifier kit is fully assembled and a heat sink is properly installed, follow these steps for operation:

1. **Connect Power:** Connect a stable DC 13.8V power supply (capable of providing 10A or more) to the VCC_PA and ground terminals. Ensure correct polarity.
2. **Connect Input:** Connect your RF input signal source (e.g., transceiver, signal generator) to the RF IN SMA connector. Ensure the input power does not exceed 5mW.
3. **Connect Output:** Connect the RF OUT SMA connector to your antenna or dummy load. Ensure the load impedance is 50 ohms.
4. **Power On:** Turn on the DC power supply.
5. **Transmit:** Apply the RF input signal. Monitor the output power and ensure the amplifier is operating within its specified parameters.

6. **Adjust Output Impedance (if necessary):** The output impedance is adjustable between 10-200 ohms. Adjust as needed for optimal performance with your specific load.

Caution: Operating the amplifier without a proper load (antenna or dummy load) or without an adequate heat sink can cause severe damage to the device.

8. Maintenance

The Tosuny Power Amplifier is designed for durability, but regular checks can extend its lifespan and ensure optimal performance.

- **Visual Inspection:** Periodically inspect the PCB for any signs of damage, loose connections, or cold solder joints.
- **Heat Sink:** Ensure the heat sink is clean and free of dust to maintain efficient heat dissipation.
- **Connections:** Check all input, output, and power connections for secure contact.
- **Environment:** Operate the amplifier in a clean, dry environment, away from excessive heat, humidity, and dust.

9. Troubleshooting

If you encounter issues with your Tosuny Power Amplifier, refer to the following troubleshooting guide:

Problem	Possible Cause	Solution
No output power	◦ Incorrect power supply connection or insufficient current. ◦ Input signal too low or absent. ◦ Faulty component or incorrect assembly. ◦ Incorrect transistor pinout.	◦ Verify DC 13.8V and 10A+ power supply. ◦ Check input signal source and connections. ◦ Carefully re-inspect all solder joints and component orientations. ◦ Verify transistor type and pinout against datasheet.
Low output power	◦ Input power too low. ◦ Impedance mismatch at output. ◦ Component degradation.	◦ Increase input power within specified limits (1-5mW). ◦ Adjust output impedance for 50 ohms. ◦ Inspect components for damage or incorrect values.
Overheating	◦ No heat sink or inadequate heat sink. ◦ Excessive input power. ◦ Impedance mismatch.	◦ Install a suitable heat sink. ◦ Reduce input power. ◦ Ensure 50-ohm load at output.
Distorted output	◦ Overdriving the amplifier (too much input power). ◦ Faulty component.	◦ Reduce input power. ◦ Inspect components for damage.

10. Warranty and Support

As this is a DIY kit, warranty coverage typically applies to the components at the time of purchase, not the assembled unit. Please check with your retailer for specific warranty terms regarding individual components.
For technical support or inquiries regarding component identification or assembly, please refer to the manufacturer's official website or contact their customer service.
Manufacturer: Tosuny
Model: Tosunyr6m78us3db

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