DollaTek IRFP260N

DollaTek IRFP260N N-Channel MOSFET Transistor Instruction Manual

Model: IRFP260N | Brand: DollaTek

1. Introduction

This manual provides essential information for the proper use, installation, and maintenance of the DollaTek IRFP260N N-Channel MOSFET Transistors. Please read this manual thoroughly before using the product to ensure safe and optimal performance.

2. Product Overview

The DollaTek IRFP260N is an N-Channel Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET) designed for various electronic applications requiring high current and voltage switching. These transistors are built using advanced processing techniques to achieve extremely low silicon resistance, contributing to their efficiency.

- **Advanced Technology:** Utilizes fifth-generation HEXFET technology for enhanced performance.
- **Low On-Resistance:** Designed for minimal resistance per silicon area, improving efficiency.
- **Fast Switching:** Offers rapid switching speeds suitable for high-frequency applications.
- **Robust Design:** Features a durable device design with a maximum operating temperature of 175°C.
- **TO-247 Package:** Provided in a TO-247 package, which includes an isolated mounting hole for improved thermal management and ease of installation compared to older TO-218 packages.

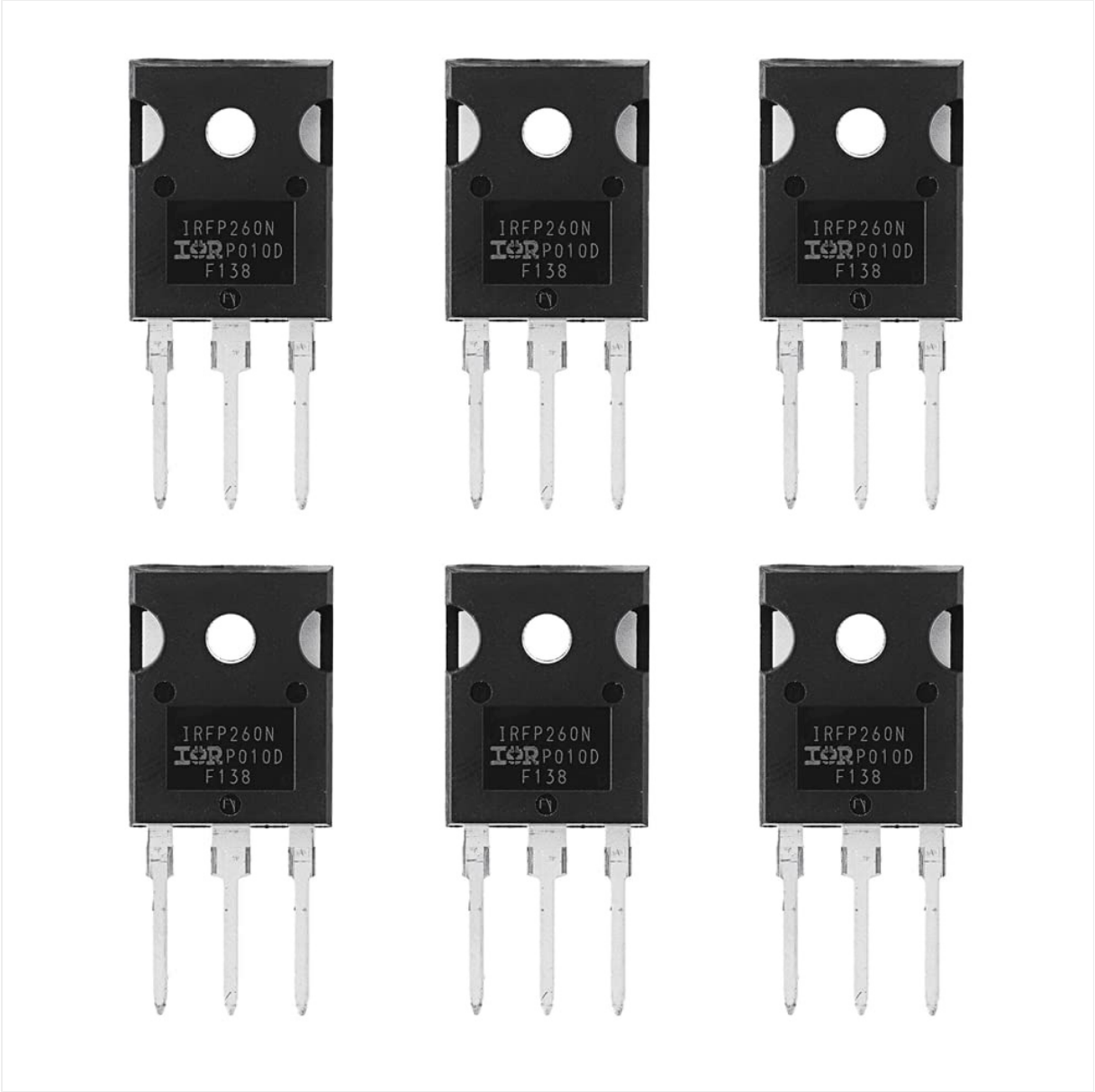

Figure 2.1: A set of six DollaTek IRFP260N N-Channel MOSFET transistors. Each transistor is black, rectangular, with three metal pins extending from one side and a mounting hole at the top. The model number "IRFP260N" is visible on the front surface.

3. Specifications

Parameter	Value
Model Number	IRFP260N
Drain-Source Voltage (VDSS)	200 V
On-State Resistance (RDS(on))	0.04 Ω
Continuous Drain Current (ID)	100 A
Operating Temperature	Up to 175°C
Package Type	TO-247AC
Manufacturer Reference	ELA20572

Figure 3.1: Front view of a single IRFP260N transistor, highlighting the model markings.

4. Setup and Installation

Proper handling and installation are crucial for the longevity and performance of MOSFETs. Follow these guidelines:

1. **Electrostatic Discharge (ESD) Precautions:** MOSFETs are sensitive to ESD. Always handle them in an ESD-safe environment, using anti-static wrist straps and mats.
2. **Physical Inspection:** Before installation, visually inspect each transistor for any signs of physical damage, such as bent pins or cracks in the package.
3. **Mounting:** The TO-247 package is designed for through-hole mounting. Ensure proper alignment of the pins with the circuit board holes. The isolated mounting hole can be used with a screw and nut for secure attachment to a heatsink, if required, to dissipate heat effectively.
4. **Soldering:** Use appropriate soldering techniques to avoid overheating the component. Apply solder quickly and efficiently. Avoid excessive heat or prolonged contact with the soldering iron.
5. **Pin Identification:** The IRFP260N typically has three pins: Gate (G), Drain (D), and Source (S). Refer to the component's datasheet for exact pinout configuration, as orientation can vary.

Figure 4.1: Angled view of an IRFP260N transistor, illustrating its physical structure and pins for mounting.

5. Operating Principles

An N-Channel MOSFET acts as an electronically controlled switch or amplifier. In its most common application as a switch, a voltage applied to the Gate (G) terminal controls the current flow between the Drain (D) and Source (S) terminals.

- **Switching Operation:** When a positive voltage (relative to the Source) is applied to the Gate, the MOSFET turns ON, allowing current to flow from Drain to Source. When the Gate voltage is zero or negative, the MOSFET turns OFF, blocking current flow.
- **Applications:** These MOSFETs are suitable for power switching applications, motor control, DC-DC converters, and other high-power electronic circuits.
- **Thermal Management:** Due to the high current capabilities, proper thermal management (e.g., using a heatsink) is essential to prevent overheating, especially in high-power applications. The TO-247 package is designed to facilitate heat dissipation.

6. Maintenance

MOSFETs are generally maintenance-free components. However, observing the following can help ensure

their long-term reliability:

- **Cleanliness:** Keep the surrounding circuit board and components free from dust, dirt, and moisture, which can lead to short circuits or reduced performance.
- **Environmental Conditions:** Operate the MOSFETs within their specified temperature and humidity ranges. Avoid extreme conditions.
- **Physical Integrity:** Avoid applying physical stress to the component or its pins after installation.
- **Thermal Monitoring:** In critical applications, consider monitoring the operating temperature of the MOSFETs to ensure they remain within safe limits.

7. Troubleshooting

If the MOSFETs are not functioning as expected, consider the following common issues:

- **No Switching/Always ON/OFF:**
  - Verify correct pin connections (Gate, Drain, Source).
  - Check the Gate drive voltage. Ensure it meets the threshold voltage for turning the MOSFET ON.
  - Inspect for cold solder joints or short circuits on the PCB.
  - Test the component for damage (e.g., shorted or open circuit between terminals).
- **Overheating:**
  - Ensure adequate heatsinking is provided, especially for high current applications.
  - Check for excessive current draw or incorrect load impedance.
  - Verify that the switching frequency is within acceptable limits for the application.
  - Confirm that the ambient temperature is not exceeding the maximum operating temperature.
- **Unexpected Behavior:**
  - Review the circuit design against the MOSFET's specifications.
  - Check for voltage spikes or transients that might be damaging the Gate.
  - Ensure proper grounding and noise suppression in the circuit.

If issues persist, consult a qualified electronics technician or refer to the detailed datasheet for the IRFP260N.

8. Safety Information

Working with electronic components, especially those handling high voltage and current, requires strict adherence to safety protocols:

- **Electrical Shock Hazard:** High voltages can be present in circuits using these MOSFETs. Always disconnect power before working on the circuit.
- **ESD Protection:** As mentioned, use ESD precautions to prevent damage to the components and ensure personal safety.
- **Heat:** MOSFETs can generate significant heat during operation. Allow components to cool before handling. Use heatsinks where necessary.
- **Qualified Personnel:** Installation and troubleshooting should only be performed by individuals with appropriate knowledge and experience in electronics.
- **Datasheet Reference:** Always refer to the official datasheet for the IRFP260N for detailed electrical

characteristics and absolute maximum ratings.

9. Support

For further technical assistance or inquiries regarding the DollaTek IRFP260N MOSFETs, please contact your supplier or a qualified electronics professional. Ensure you have the product model number (IRFP260N) and any relevant circuit diagrams or measurements available when seeking support.