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› [BOJACK](#) /

› [BOJACK IRF640 MOSFET Instruction Manual](#)

BOJACK BJ-MOS-640

BOJACK IRF640 MOSFET Instruction Manual

Model: BJ-MOS-640 | Brand: BOJACK

[Introduction](#) [Product Overview](#) [Specifications](#) [Setup & Installation](#) [Operation](#) [Maintenance](#) [Troubleshooting](#) [Safety Information](#) [Support](#)

1. INTRODUCTION

This manual provides essential information for the proper use, installation, and maintenance of the BOJACK IRF640 MOSFET. The IRF640 is a robust N-Channel Power MOSFET designed for a wide range of applications in both analog and digital circuits. Please read this manual thoroughly before using the product to ensure safe and optimal performance.

2. PRODUCT OVERVIEW

The BOJACK IRF640 MOSFET is a high-performance N-Channel Power MOSFET supplied in a TO-220AB package. It is engineered for applications requiring high current and voltage handling capabilities, such as power supplies, motor control, and switching circuits. This component is lead-free and environmentally protected.

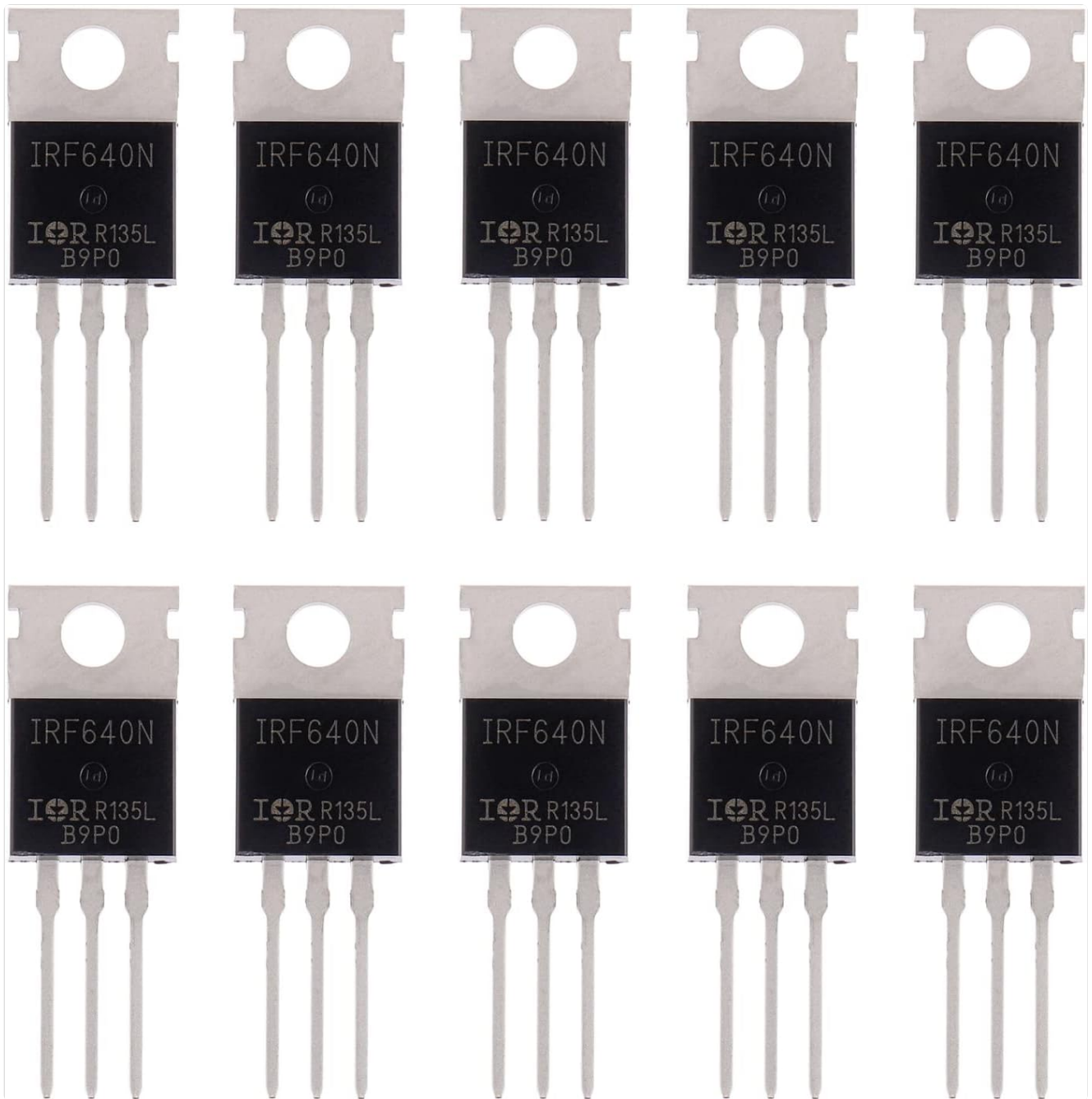


Figure 2.1: BOJACK IRF640N MOSFETs (Pack of 10)

This image displays a pack of ten BOJACK IRF640N MOSFETs. Each MOSFET is clearly labeled "IRF640N" and features the standard TO-220AB package with three leads for through-hole mounting. These components are typically used in power electronics applications.



Figure 2.2: MOSFETs in Storage Case

The image shows several BOJACK IRF640 MOSFETs securely stored within a transparent plastic case. This packaging helps protect the components from physical damage and static discharge during storage and transport.

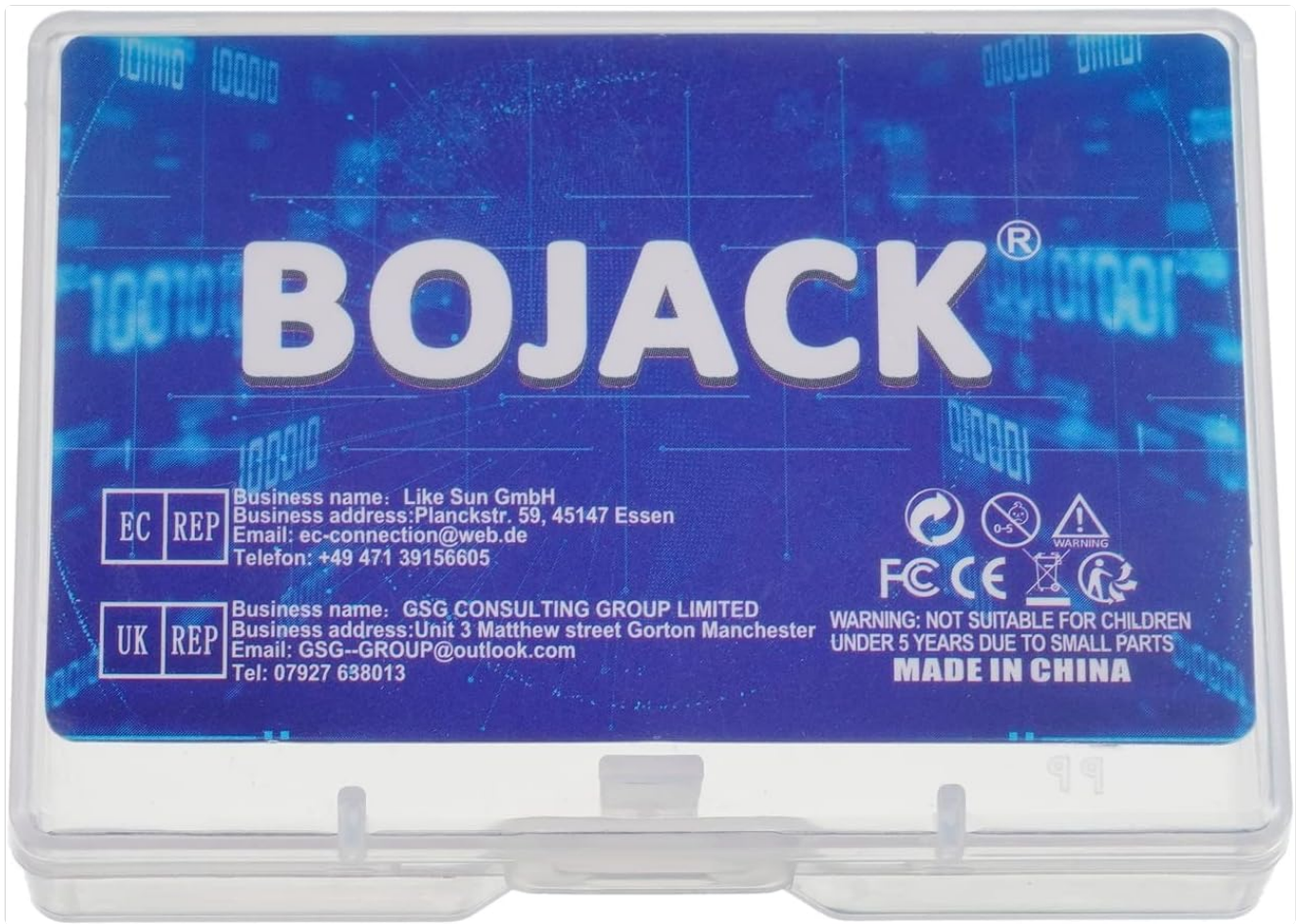


Figure 2.3: BOJACK Branding on Case

This image provides a detailed view of the BOJACK brand logo and various regulatory markings, including EC REP, UK REP, FC CE, and a warning symbol, printed on the lid of the MOSFET storage case. It also includes contact information for the manufacturer's representatives.

3. TECHNICAL SPECIFICATIONS

The following table details the key technical specifications of the BOJACK IRF640 MOSFET:

Parameter	Value
Transistor Type	MOSFET
Transistor Polarity	N-Channel
Drain Current (Id Max)	18A
Voltage Vds Max	200V
Power (Max)	125W
On-state Resistance Rds(on)	0.15 Ohm
Voltage Rds Measurement	10V
Voltage Vgs Highest	4V
Package Type	TO-220AB
Number of Pins	3

Parameter	Value
Thermal Resistance Junction to Case	1°C/W
Voltage Vgs @ Rds on Measurement	10V
Voltage Vds Typical	200V
Current Idm Pulse	72A
Mounting Type	Through Hole Mounting
Threshold Voltage, Vgs th Typical	4V
Threshold Voltage, Vgs th Highest	4V

4. SETUP & INSTALLATION

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

- **Electrostatic Discharge (ESD) Protection:** MOSFETs are sensitive to ESD. Always handle components in an ESD-safe environment, using anti-static mats, wrist straps, and grounded tools.
- **Pin Identification:** The TO-220AB package typically has three pins: Gate (G), Drain (D), and Source (S). Refer to the component's datasheet for exact pinout if unsure.
- **Mounting:** The TO-220AB package is designed for through-hole mounting. Ensure proper alignment with the PCB holes.
- **Heat Sinking:** For applications involving significant power dissipation, a heat sink is essential to maintain the MOSFET's operating temperature within safe limits. Apply thermal paste between the MOSFET's metal tab and the heat sink for optimal thermal transfer.
- **Soldering:** Use appropriate soldering techniques to avoid overheating the component. Keep soldering time and temperature to a minimum.
- **Circuit Design:** Integrate the MOSFET into a circuit designed to operate within its specified voltage, current, and power limits. Include gate drive circuitry as required for proper switching.

5. OPERATION

The IRF640 MOSFET functions as a voltage-controlled switch or amplifier. Its operation depends on the voltage applied to its gate terminal relative to its source terminal.

- **Switching Applications:**
 - To turn the MOSFET ON (conduct current from Drain to Source), apply a positive voltage (Vgs) to the Gate that exceeds the threshold voltage (Vgs th).
 - To turn the MOSFET OFF (block current), apply 0V or a negative voltage to the Gate relative to the Source.
 - Ensure the gate drive voltage is within the maximum Vgs rating (4V highest, 10V for Rds on measurement).
- **Current and Voltage Limits:** Do not exceed the maximum Drain current (18A continuous, 72A pulse) or Drain-Source voltage (200V) to prevent damage.
- **Power Dissipation:** Monitor the MOSFET's temperature during operation. Excessive heat can lead to thermal

runaway and component failure. Ensure adequate cooling.

6. MAINTENANCE

MOSFETs are generally robust components that require minimal maintenance once properly installed. However, periodic checks can help ensure long-term reliability:

- **Visual Inspection:** Periodically inspect the MOSFET and surrounding circuitry for any signs of physical damage, discoloration (indicating overheating), or loose connections.
- **Thermal Management:** Ensure that heat sinks are clean and free of dust buildup, which can impede airflow and reduce cooling efficiency. Verify that thermal paste is still effective.
- **Environmental Conditions:** Operate the MOSFET within its specified environmental conditions (temperature, humidity) to prevent premature degradation.
- **Storage:** Store unused MOSFETs in their original anti-static packaging in a cool, dry place to protect them from ESD and environmental factors.

7. TROUBLESHOOTING

If you encounter issues with the BOJACK IRF640 MOSFET, consider the following common problems and solutions:

Problem	Possible Cause	Solution
MOSFET not switching ON/OFF	Incorrect gate voltage; damaged gate; faulty gate driver.	Verify gate voltage levels; check gate driver circuit; replace MOSFET if gate is damaged.
MOSFET overheating	Insufficient heat sinking; excessive current/voltage; high switching losses.	Improve heat sink, add fan; reduce load; optimize switching frequency/gate drive.
Unexpected component failure	Overvoltage/overcurrent transient; ESD damage; manufacturing defect.	Implement protection circuits (snubbers, clamps); ensure proper ESD handling; contact supplier if defect suspected.
High On-state Resistance (R _{ds(on)})	Inadequate gate drive voltage; component degradation.	Ensure V _{gs} is sufficient (e.g., 10V); replace MOSFET if degraded.

8. SAFETY INFORMATION

Adhere to the following safety precautions when working with electronic components, especially power MOSFETs:

- **Electrical Shock Hazard:** Always disconnect power before working on circuits. High voltages can be present even after power is off due to stored energy in capacitors.
- **ESD Precautions:** As mentioned, MOSFETs are highly susceptible to electrostatic discharge. Always use proper ESD protection.
- **Heat:** MOSFETs can generate significant heat during operation. Allow components to cool before handling. Use caution when touching heat sinks.
- **Soldering Safety:** Work in a well-ventilated area. Use appropriate personal protective equipment (PPE) such as safety glasses.
- **Component Disposal:** Dispose of electronic components responsibly according to local regulations. The

BOJACK IRF640 is lead-free.

- **Not for Children:** This product contains small parts and is not suitable for children under 5 years due to choking hazards.

9. WARRANTY AND SUPPORT

For technical support, product inquiries, or warranty information regarding your BOJACK IRF640 MOSFETs, please contact BOJACK ELECTRON, the seller, directly through the platform where the purchase was made. Refer to your purchase documentation for specific contact details.

General return policy for this product is 30 days for refund/replacement, as per Amazon's standard policy. For specific warranty terms, please consult the manufacturer's official documentation or contact BOJACK directly.

Manufacturer: BOJACK

Part Number: BJ-MOS-640

Seller: BOJACK ELECTRON

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