Irfora SZ305

Irfora SZ305 Professional Digital Multimeter User Manual

Model: SZ305

1. Product Overview

The Irfora SZ305 is a professional digital multimeter designed for accurate and rapid measurement of various electrical parameters. It features a high-definition backlit LCD display for clear readings in diverse environments and a retractable stand for convenient use.
Key functions include:

- AC/DC Voltage and Current measurement
- Diode, Resistance, and Capacitance testing
- Frequency measurement
- Buzzer continuity test
- hFE Triode testing for NPN/PNP transistors
- Non-Contact Voltage (NCV) detection
- Battery detection (1.5V, 3V, 9V, 12V)

Image 1.1: The Irfora SZ305 Digital Multimeter highlighting its various measurement functions including AC/DC voltage/current, diode, capacitance, frequency, buzzer, resistance, NCV induction, hFE, and battery detection.

2. Safety Information

Please read and understand all safety instructions before operating the multimeter. Failure to follow these instructions may result in electric shock, fire, or damage to the device.

- Always ensure the multimeter is set to the correct function and range before making any measurements.
- Do not attempt to measure voltages or currents exceeding the maximum specified limits for the device.
- Exercise extreme caution when working with live circuits. High voltages can be dangerous.
- Inspect test leads for damage before each use. Do not use if insulation is cracked or damaged.
- Do not operate the multimeter if it appears damaged or is not functioning properly.
- Avoid using the multimeter in wet environments or during electrical storms.
- Replace batteries promptly when the low battery indicator appears to ensure accurate readings.
- Always disconnect test leads from the circuit before changing functions or ranges.

3. Setup and Initial Use

3.1 Battery Installation

The multimeter requires batteries for operation. To install or replace batteries:

1. Ensure the multimeter is powered off and test leads are disconnected.
2. Locate the battery compartment cover on the back of the device.
3. Use a screwdriver to open the compartment.
4. Insert new batteries, observing correct polarity (+ and -).
5. Replace the battery compartment cover and secure it with the screw.

3.2 Using the Retractable Support Stand

The multimeter is equipped with a retractable stand on its back for convenient viewing during measurements.

- To deploy the stand, gently pull it outwards from the back of the device until it locks into position.
- Place the multimeter on a flat surface.
- To retract the stand, push it back into its original position until it is flush with the device body.

Image 3.1: The Irfora SZ305 Digital Multimeter demonstrating its retractable back support frame for angled viewing on a table.

4. Operating Instructions

This section details how to perform various measurements with your Irfora SZ305 Digital Multimeter.

4.1 Power On/Off and Backlight

- To power on the device, rotate the rotary switch from "AUTO POWER OFF" to any desired measurement function.
- To power off, rotate the switch back to "AUTO POWER OFF". The device also features an auto-power-off function after a period of inactivity.
- To activate the LCD backlight, press and hold the "H/☼" button. The backlight will illuminate, improving visibility in dark environments. Press and hold again to turn off.

Image 4.1: The Irfora SZ305 Digital Multimeter displaying its high-definition backlit LCD screen, enhancing readability in low-light conditions.

4.2 AC/DC Voltage Measurement

1. Insert the red test lead into the "VHz" jack and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the "V~" (AC Voltage) or "V=" (DC Voltage) range.
3. Connect the test probes across the circuit or component to be measured.
4. Read the voltage value displayed on the LCD screen.

Image 4.2: A user measuring AC voltage with the Irfora SZ305 Digital Multimeter in an electrical panel, demonstrating proper probe placement.

Image 4.3: Examples of functional testing with the Irfora SZ305, showing measurements for AC voltage, DC voltage, Hertz frequency, diode, resistance, and continuity (buzzer).

4.3 AC/DC Current Measurement

Caution: Ensure the circuit is de-energized before connecting the multimeter in series for current measurement. Incorrect connection can blow the fuse or damage the meter.

1. Insert the red test lead into the "mA" or "20A" jack (depending on expected current) and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the appropriate "mA~" / "mA=" or "20A~" / "20A=" range.
3. Open the circuit where current is to be measured and connect the multimeter in series.
4. Apply power to the circuit and read the current value.

Image 4.4: Examples of functional testing with the Irfora SZ305, showing measurements for 9V, 3V, 1.5V, and 12V batteries, hFE, capacitance, AC current, and DC current.

4.4 Resistance Measurement

1. Insert the red test lead into the "VHz" jack and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the "Ω" (Resistance) range.
3. Ensure the component to be measured is de-energized. Connect the test probes across the component.
4. Read the resistance value.

4.5 Capacitance Measurement

1. Insert the red test lead into the "VHz" jack and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the "F" (Capacitance) range.
3. Ensure the capacitor is fully discharged before measurement to prevent damage to the meter.
4. Connect the test probes across the capacitor terminals.
5. Read the capacitance value.

4.6 Diode Test and Continuity (Buzzer)

1. Insert the red test lead into the "VHz" jack and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the "Diode/Buzzer" symbol.
3. **For Diode Test:** Connect the red probe to the anode and the black probe to the cathode of the diode. A forward voltage drop will be displayed. Reverse the probes; an open circuit ("OL") should be displayed.

4. **For Continuity Test:** Connect the probes across the circuit or component. If resistance is below a certain threshold, the buzzer will sound, indicating continuity.

4.7 Frequency Measurement (Hz)

1. Insert the red test lead into the "VHz" jack and the black test lead into the "COM" jack.
2. Rotate the rotary switch to the "Hz" range.
3. Connect the test probes across the signal source.
4. Read the frequency value displayed.

4.8 hFE Triode Test

This function measures the DC current gain (hFE) of transistors.

1. Rotate the rotary switch to the "hFE" position.
2. Identify whether the transistor is NPN or PNP type.
3. Insert the transistor leads (Emitter, Base, Collector) into the corresponding sockets on the multimeter's hFE test port.
4. Read the hFE value displayed on the screen.

Image 4.5: The Irfora SZ305 Digital Multimeter conducting an hFE test, showing a transistor inserted into the dedicated test socket.

4.9 Non-Contact Voltage (NCV) Detection

The NCV function allows for detection of AC voltage without direct contact, enhancing safety.

1. Rotate the rotary switch to the "NCV" position.
2. Bring the top front part of the multimeter close to the suspected AC voltage source (e.g., a live wire, outlet).
3. The multimeter will emit an audible alarm and the NCV indicator will flash. The closer the device is to the voltage source, the more urgent the alarm will be.

Image 4.6: The Irfora SZ305 Digital Multimeter demonstrating its Non-Contact Voltage (NCV) detection feature near an electrical outlet, indicating the presence of AC voltage.

4.10 Battery Detection (1.5V, 3V, 9V, 12V)

The multimeter can test common battery voltages.

1. Rotate the rotary switch to the desired battery voltage range (e.g., "1.5V BAT", "3V BAT", "9V BAT", "12V BAT").
2. Connect the red test lead to the positive terminal of the battery and the black test lead to the negative terminal.
3. Read the voltage displayed on the screen.

5. Maintenance

5.1 Cleaning

To clean the multimeter, wipe the case with a damp cloth and a mild detergent. Do not use abrasives or solvents. Ensure the device is powered off and disconnected from any circuits before cleaning.

5.2 Battery Replacement

Refer to section 3.1 for instructions on battery installation and replacement. Replace batteries when the low battery indicator appears on the display to maintain measurement accuracy.

5.3 Fuse Replacement

If the current measurement function fails, the fuse may need replacement. This typically requires opening the back casing of the multimeter. Refer to the specifications for the correct fuse type and rating. If unsure, consult a qualified technician.

6. Troubleshooting

- **No display or weak display:**
  - Check battery charge. Replace batteries if low.
  - Ensure the multimeter is powered on by rotating the switch from "AUTO POWER OFF".
- **Incorrect readings:**
  - Ensure the correct function and range are selected for the measurement.
  - Check test leads for proper connection and damage.
  - Verify battery charge. Low batteries can affect accuracy.
  - Ensure the circuit or component is properly prepared (e.g., capacitor discharged).
- **Current measurement not working:**
  - Check if the fuse is blown. Replace if necessary (refer to section 5.3).
  - Ensure test leads are connected to the correct current jacks ("mA" or "20A").
  - Verify the multimeter is connected in series with the circuit.
- **NCV function not responding:**
  - Ensure the rotary switch is set to "NCV".
  - Confirm there is an AC voltage source present.

7. Specifications

Feature	Detail
Model	SZ305
Brand	Irfora
Display	1999 Counts, Backlit LCD
Functions	AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency, Diode, Continuity, hFE, NCV, Battery Test
Auto Power Off	Yes
Color	Black

Feature	Detail
Manufacturer Reference	TYHDEE24863B

Note: Detailed measurement ranges and accuracies are typically found in the full product datasheet.