LinkZill

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TruEbox TFT-IV User Guide

V2.0

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Product Overview

TruEbox TFT-IV is a portable electrical test and analysis system for semiconductors. The system provides three bias voltage channels and measures one current channel, with modes IdVg and IdVd. The device can monitor the real-time I-t or I-V curves and share the measured data via the mobile app. TruEbox TFT-IV excels in fast response speed and high resolution (pA), making it a perfect candidate for electrical testing and analysis of semiconductors. By measuring MOS tubes, TFT, photodiodes, and other devices, the TruEbox TFT-IV can help in biomedical testing, portable electronic product development, sports health monitoring, and further scenarios.

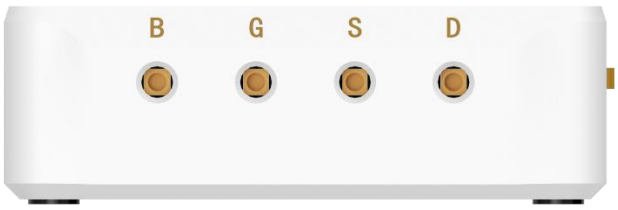
Parameter	Specification
L×W×H	114×105×37 mm
Weight	400 g
Charging interface	8.4 (AC-DC Adapter)
Test interface	4 channels of adjustable voltage output (channel “D” measures current)
Communication	Bluetooth
Terminal	Phone/Tablet (Android 8.0 or higher)
Current range	10pA~1mA (both ways)
Current accuracy	>10nA: 5% <10nA: 10%+100pA/current value
Voltage output range and accuracy	-25V~+25V, relative voltage deviation<20mV
Duration	10 hours
Data output rate	5 point/second
Save	Original data: .CSV; Image: .PNG

Product List

Host	X1
8.4V Charger	X1
User Guide (Electronic Ver.)	X1
Guarantees Certificate	X1
Single-Channel MCX Alligator Clip Cable	X4
4-Pin Probe Clip Connector	X1
MCX Cable	X4

Interface Description

Pin Assignment:



“B”, “G“, “S“, and “D“ can output voltage, while “D” can also measure current in both directions.
In case of testing TFT, please connect “B” to the BackGate terminal, “G“ to the Gate terminal, “S“ to the Source terminal, and “D“ to the Drain terminal of the TFT. Start the test to set the bias voltage V_{BS} between ±25V, V_{GS} between ±25V, V_{DS} between ±25V, and measure bidirectional I_d (±10pA ~ ±1mA).

Operating Manual

1. APP Installation:

Scan the QR code with the default browser of the mobile device to download. After the installation, the TruEbox App will appear on the table of the device.

⚠ **The App only supports devices with an android version 8.0 or higher. The App will need permission to access the Bluetooth/location/storage of the terminal device so that it can work normally. The accession will not do any harm to the terminal devices, please don't worry about the safety of the device.**

2. System Connection:

a. Turn on the TruEbox TFT-IV. When powered on, the white indicator light and the screen should be on. If not, please charge the system for the low battery.

b. Open the app and press the Bluetooth button on the top right, and a window with "Available Devices" will pop up. Find and connect the device with the Bluetooth name "TFT-IV+serial number" ⚠ (If the correct option is not available, please press the "Cancel" button and redo the previous procedures). Insert the Bluetooth password **123456** to activate the TruEbox.

c. Choose "IdVg", "IdVd", or "I-t" measurement in the app according to the need and measured devices.

⚠ **The TruEbox TFT-IV will connect to the application automatically after the first-time pairing (or shown as "TFT-IV+serial number" in the "Paired Devices" window).**

3. Measurement:

a. Press the setting button to set the bias voltage.

b. Press the start button to start the test; press the pause button to stop the test.

c. Press the clear button to delete data points from the graph.

d. Press the save button to save the measured data in .csv (table) or .png (graph). Select the file and share the data via Bluetooth, email, and other mobile apps. (The data is saved in the file "LinkZill" of the root directory by default.)

e. Press the return button to go back to the previous page and reset the test.

f. Press the graph to show or hide the characteristic curve.

Example

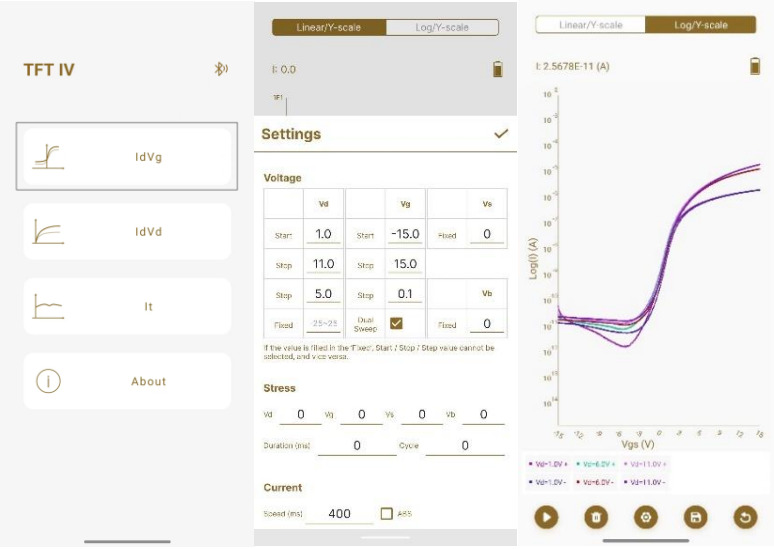
Take the three-terminal n-type TFT as an example. Connect the "G" of the TruEbox TFT-IV to the Gate terminal, "S" to the Source terminal, and "D" to the Drain terminal of the measured TFT.

1, IdVg mode:

i, On the page "IdVg", press ⚙ to set the parameters shown in the following picture, with Vgs step of 0.1V and sweep between ±15V in both directions;

ii, Vds start from 1V to 11V with step of 5V, leaving 6 curves after the **[Dual Sweep]**.

iii, You can set Vd constant by typing in the voltage in the box "Fixed" under "Vd". You can also sweep multiple groups of data by typing in the desired number of cycles in the box "Cycle" under "Stress".

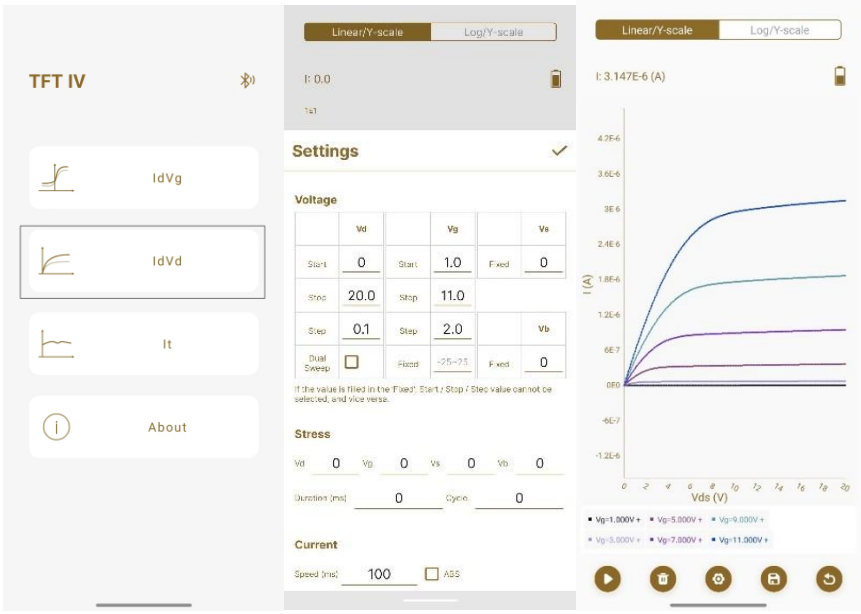


2, IdVd mode:

i, On the page "IdVd", press ⚙ to set the parameters shown in the following picture, with Vds step of 0.1V and sweep between 0V and 20V.

ii, Vgs start from 1V to 11V with step of 2V, leaving 6 curves after the sweeping.

iii, You can set Vg constant by typing in the voltage in the box "Fixed" under "Vg". You can also sweep multiple groups of data by typing in the desired number of cycles in the box "Cycle" under "Stress".

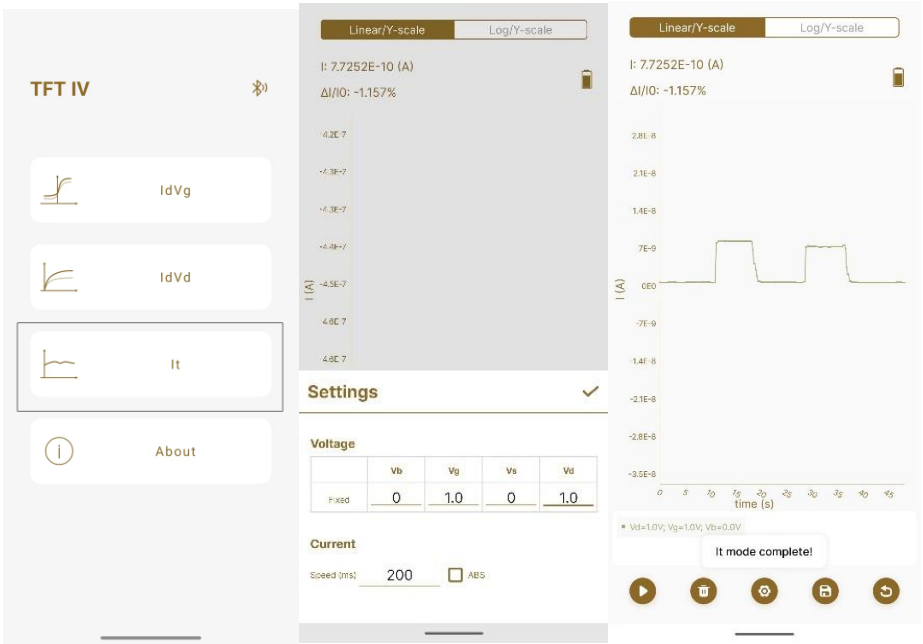


3, It mode:

i, On the page “It”, press to set the parameters shown in the following picture, with Vb as 0V, Vg as 1.0V, Vs as 0V, and Vd as 1.0V.

ii, Change the illumination to the tested device and monitor the change in current.

iii, Press to clear the setting and reset parameters.



Notice:

1, Stress Function (for “IdVg” and “IdVd” only): the system will stress test the device between two cycles a fter the software fills in the required parameters and duration.

e.g.: Set “Cycle” as 3, “Duration (ms)” as 100, and the system will start the test in following procedures:

Cycle1	Stress (for 100ms)	Cycle2	Stress (for 100ms)	Cycle3

2, For four-terminal devices, you can set the needed voltage for BackGate (Vb) manually.

3, Speed: the set time duration for current collection.

Warnings:

⚠ Please don’t use the matrix readout system while charging. Avoid using the system in complex electromagnetic environments (strong power, AC magnetic field et. al).

⚠ Please use the original charger to avoid damage.

⚠ The charging indicator is red when the system is charging and change to green when the battery is full. To avoid damaging the system, please unplug the charger when the system is fully charged.

⚠ Please don’t use the system in high temperature or high humidity environments. Don’t throw the system into fire or water to avoid damage or explosion.

⚠ Please don’t bash or drop the system from height to avoid damage.

⚠ All indicators (accuracy, error, etc.) are based on the standard clips.