Welcome!

Device Characterization with the Keithley Model 4200-SCS Characterization System

Troubleshooting

Use the Tools available in KITE: Offset corrections, Confidence Check, Status information

Ensure proper settings in KITE: sweep delay times, test frequency, ac drive voltage, dc source voltage, etc.

Make sure proper cabling: all cabling lengths same, shields connected as close as possible to DUT

Ensure good DUT and proper contact to DUT: use Confidence Check to verify.

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Troubleshooting

For making low and high capacitance measurements in general:

Low Capacitance: use Open Correction, high test frequency (100kHz, 1MHz), Quiet mode, guard (if applicable), lowest current (or Auto) range, add sufficient sweep delay time for settling.

High Capacitance: use Short Correction, low test frequency (10 kHz)

Higher Frequency: Ensure correct cabling

ABB Unlock Status Error

ABB Unlock Errors occur when the ABB is unbalanced. Possible reasons an ABB Unlock Error may occur:

1) Cable length not the same on CVU terminals

2) HPOT or LPOT terminals got disconnected

3) Excessive noise on LPOT terminal

4) Interfering high frequency sources that are the same frequency as the measurement frequency

5) Too high stray capacitance to common

Use Confidence Check to help troubleshoot ABB errors!

Troubleshooting Guide

Error Symptom	Possible Causes	Suggestions to Minimize or Avoid Error
Capacitance too high	Cabling and Connection capacitance affecting measurements	Perform Offset Correction and Enable in ITM, minimize stray capacitance, minimize cable length if possible
	Light left ON or Lid Open	Turn off light or close lid
	Unwanted capacitance from other terminals affecting measurement	Use guarding
	Shorted DUT	Try another DUT. Use Confidence Check for verification.

Troubleshooting Guide

Error Symptom	Possible Causes	Suggestions to Minimize or Avoid Error
Capacitance too low	Device not in equilibrium	Increase Delay Time
	Poor or no contact to device	If readings are in the fF range and are expected to be much higher, re-verify connections using Confidence Check. May need to improve contact between wafer and chuck.
	Open DUT	Try another DUT to verify if the problem may be the DUT or something else. Use Confidence Check.
	Coax cable shields not connected	Connect shields near DUT. Reduce test frequency.

Troubleshooting Guide

Error Symptom	Possible Causes	Suggestions to Minimize or Avoid Error
Noisy Measurements	Noisy DUT or environment	Use Quiet or Custom Mode; increase or reduce test frequency depending on magnitude of capacitance; verify prober contact to DUT
	DUT not shielded electrostatically	Ensure proper test fixture shielding. The shield must be electrically connected to the coaxial shield.
"Tails" on end of C-V Sweep	Device not in equilibrium	Set PreSoak voltage to first voltage in sweep and apply sufficient Hold Time to allow DUT to charge up.
	Leaky Device	Try measuring the leakage current using the SMU, reduce the dc voltage

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