

Keithley 2602 Demo Program: Bipolar Junction Transistor Component Test Example

This example program demonstrates the Model 2602 using Keithley's embedded Test Script Processor™ technology to perform a high speed functional test on a bipolar junction transistor. This version of the program runs slowly with cues on the Model 2602 front panel so the test can be easily followed.

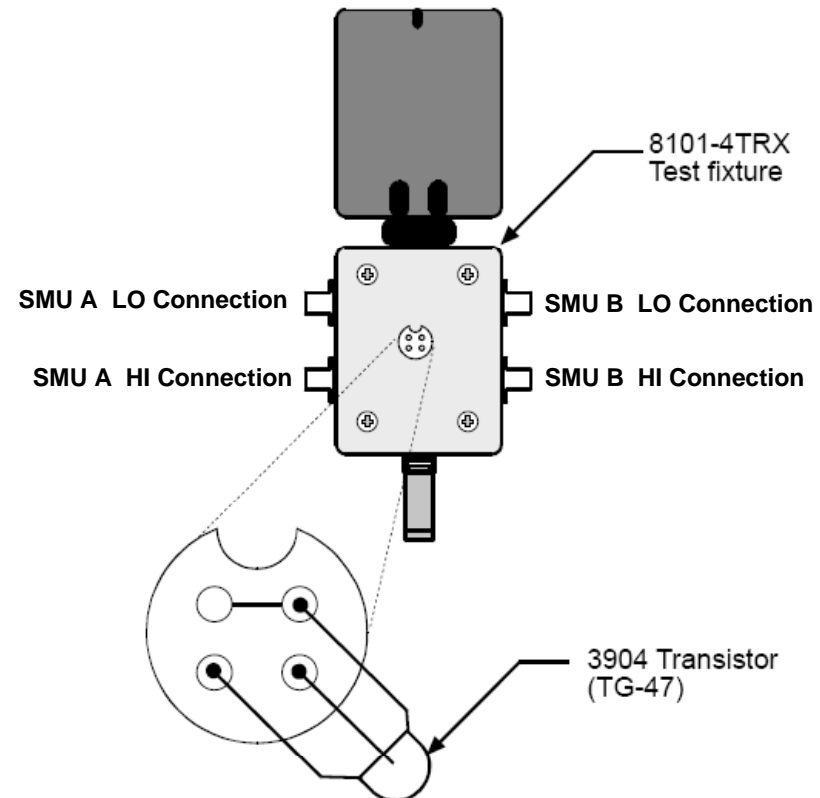


Physical Connections

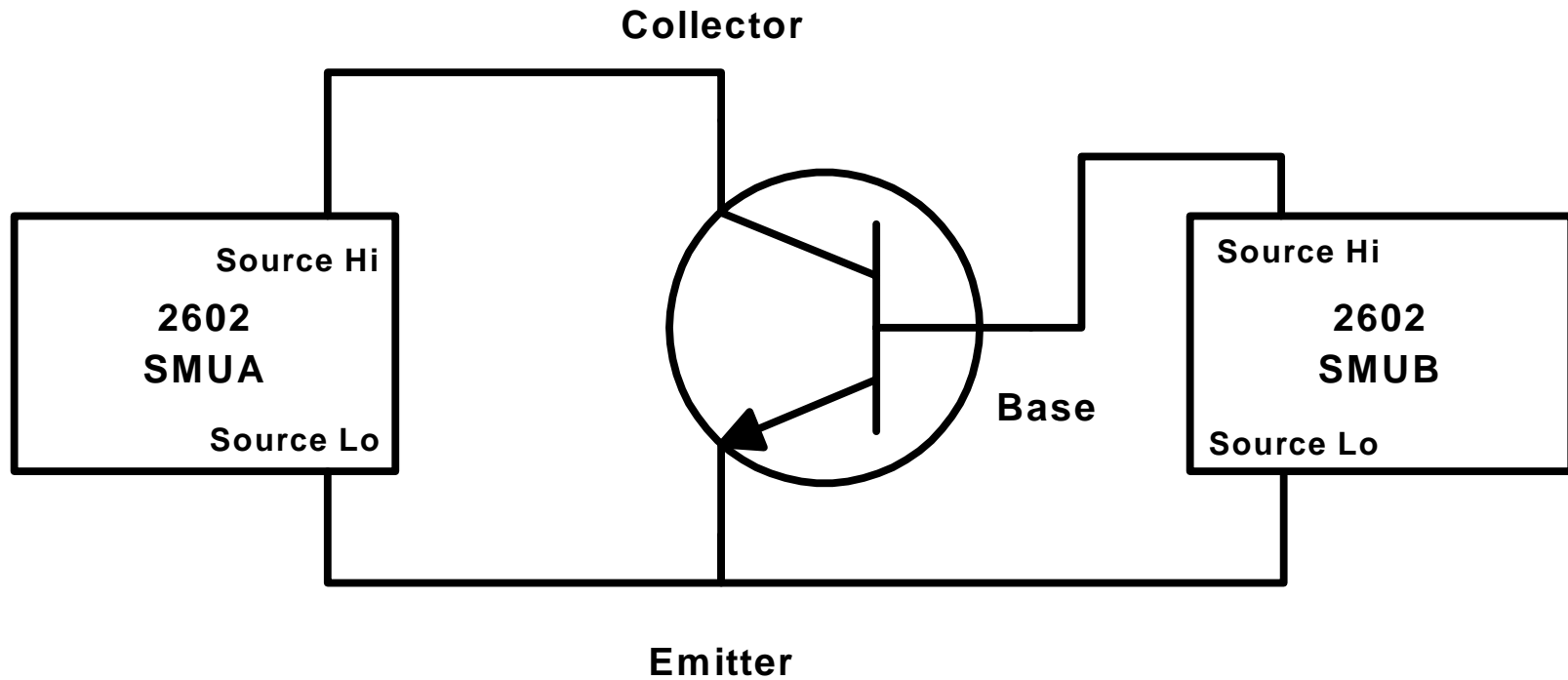
Parts needed:

- 1 Model 8101- 4TRX Test Fixture
- 2 Model 2600-Demo-TRX Cables
- 1 2N3904 Transistor

Connections:

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Test Schematic

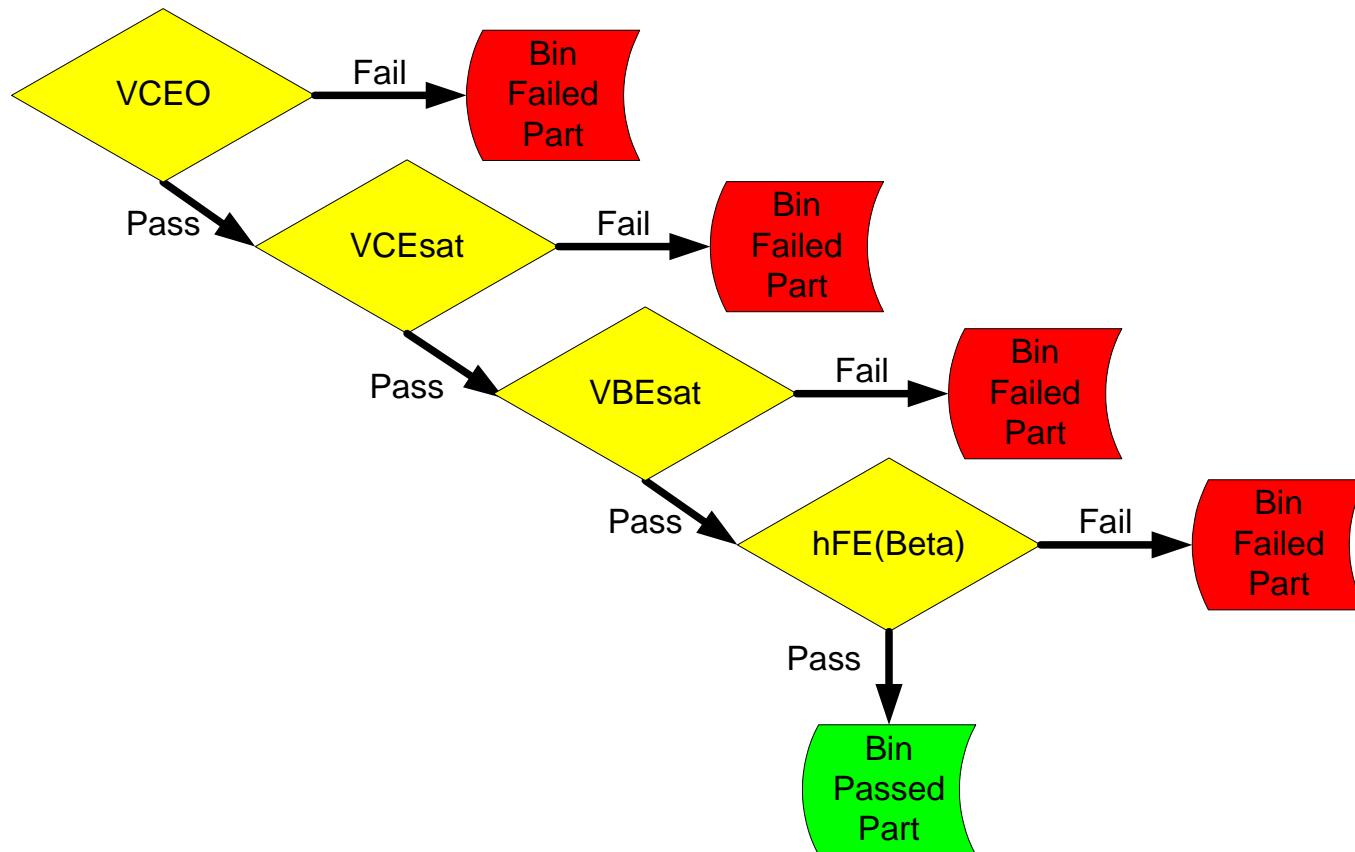
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BJT Test Overview

- **VCEO:**
 - Breakdown voltage with open base
 - Procedure
 - Open the base-emitter junction by sourcing 0A on a low current range
 - Source 1mA into the collector, measure voltage, evaluate pass / fail
- **VCEsat / VBEsat:**
 - Transistor saturation voltages
 - Procedure
 - Base Source 1mA, measure voltage, evaluate pass / fail.
 - Collector Source 10mA, measure voltage, evaluate pass / fail.
- **hFE (beta):**
 - Transistor current gain
 - Procedure
 - Source 1V on collector
 - Perform binary search algorithm to set collector current to 10mA
 - Measure base and collector currents, calculate hFE ($hFE = I_c/I_b$), evaluate pass / fail

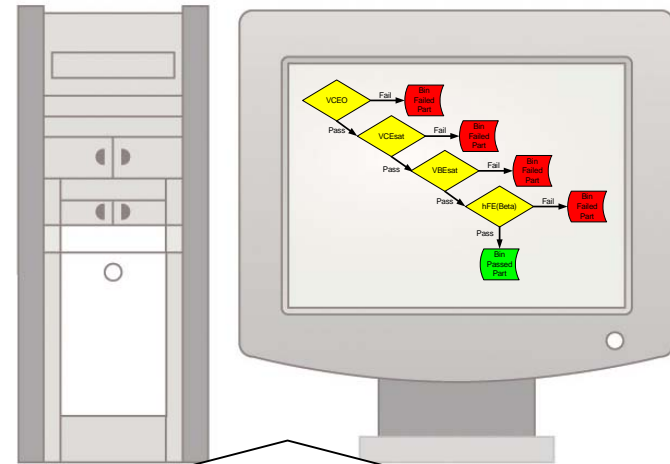
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BJT Test Sequence

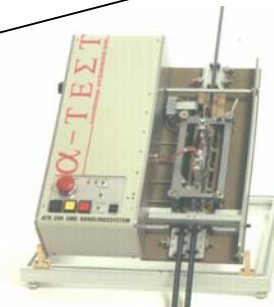
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The Traditional Test System

- Full test sequence is controlled in the PC
- PC sends many low level source and measure commands to control SMU instruments
- Data must be sent to the PC to perform pass / fail decisions
- Excessive communications between the PC and instruments result in poor test speed
- The 2600 Series SourceMeters are compatible with traditional test systems using basic instrument control commands
- BUT...For dramatically faster test times, use Keithley's Test Script Processor (TSP)



• Instrument control
• Data
• Handler control

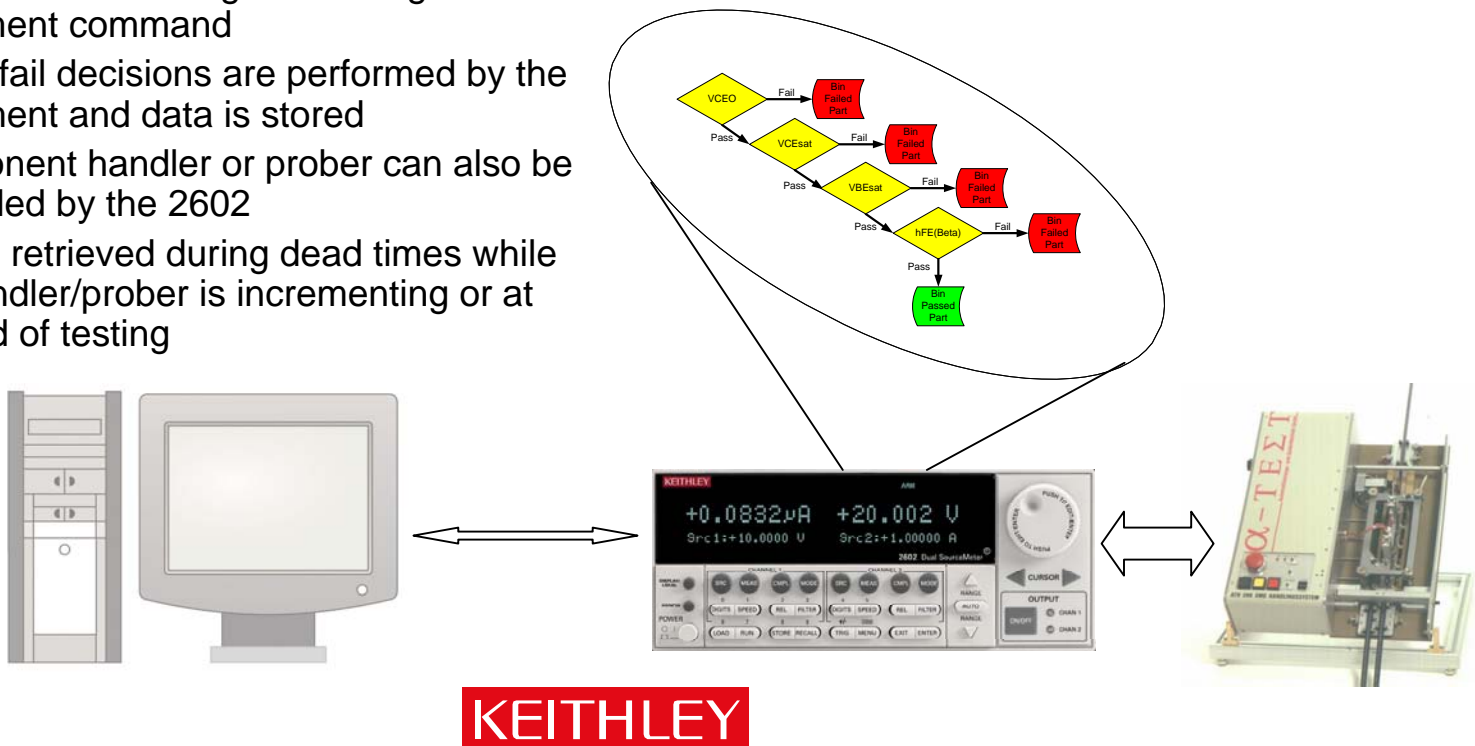


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Faster Test Times With Embedded Test Script Processor!

- With Keithley's Test Script Processor:
 - The full diode test sequence runs inside Model 2602 System SourceMeter instead of on the PC
 - PC initiates all testing with a single instrument command
 - Pass / fail decisions are performed by the instrument and data is stored
 - Component handler or prober can also be controlled by the 2602
 - Data is retrieved during dead times while the handler/prober is incrementing or at the end of testing

- Elimination of excessive communication and PC delays results in up to **10X faster test times**



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