



# Characteristics of All Diodes with Digital Meters

(PN Junction, Zener, Schottky, Light Emitting Diode LED, Varactor Diode)

## Model : SA-111DM

**SINCOM SA-111DM Characteristics of All Diodes** with Digital meters is remarkable standalone an **All-In-One Trainer** which is useful to study the V-I characteristics of Silicon, Germanium PN Junction Diodes, Zener Diode, Schottky Diode, Light Emitting Diode LED and Varactor Diodes. All these diodes have a specific application in the various electronic circuits. This combine trainer of all diodes is simply designed to plot PN Junction Diode, Zener diode, Schottky, LED, Varactor Diode characteristics and determine its various parameters in a simple experimental way. The trainer is equipped with on board Digital voltmeter and Digital Ammeter.

## Features

- ❖ PN Junction, Zener, Schottky, LED and Varactor Diodes are provided.
- ❖ Silicon & Germanium PN Junction diodes, two Zener Diodes, one Schottky Diode, one Red color LED and one Varactor Diodes are provided
- ❖ PN Junction Diodes used are having Higher average forward current and Non-repetitive Peak forward surge current, Higher Peak repetitive Reverse voltage and Power dissipation.
- ❖ Zener Diodes used are having Low forward voltage drop and High operating Temperature range.
- ❖ LED used is having Red Color, 5mm Diameter and convex front.
- ❖ Schottky Diode used is having Low forward voltage drop and High Operating frequency
- ❖ Varactor Diode used is having Low power, Large variation in junction capacitance
- ❖ DO-41 Diodes package
- ❖ Current controlling resistor in series
- ❖ Facility to vary wide range of applied DC input voltage
- ❖ In-Built Variable regulated DC Power Supply
- ❖ Multi color Circuit Diagram printed on the front of the white board
- ❖ Enclosed in an attractive, light weight, High Quality, Poly Coated Imported Pine Wooden cabinet
- ❖ On Board 3<sup>1/2</sup> Digit Digital Voltmeter and Ammeter
- ❖ Easy to select the different types of Diodes
- ❖ User friendly Designed
- ❖ Very Easy for Operation
- ❖ Interconnections by 2mm high quality banana sockets and pins
- ❖ Maximum Test points to explore all the corners of experiment
- ❖ 1 Year Warranty

## Technical Specifications

- |                         |   |
|-------------------------|---|
| ▪ AC Mains Power Supply | : 230 ±10%, 50Hz  |
| ▪ DC Power Supply       | : IC Regulated Variable 0V to +12V / 500mA  |
| ▪ Diodes Used           | : Two PN Junction Diodes, Two Zener Diodes, One Schottky Diode, One LED and One Varactor Diode. |
| ▪ Diode Package         | : DO-41 Tape and Reel type  |



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- Diodes Pin Count : Two
- Current Controlling Resistor : MFR 1K $\Omega$ ,  $\pm 5\%$  in series
- Digital Voltmeter : 0-20V
- Digital Ammeter : 0-200 $\mu$ A and 0-20mA with range selector switch
- Meter Display : Red Color, 3<sup>1/2</sup> Digit , LED Display
- For PN Junction Diodes
  - Diodes Used : Silicon and Germanium PN Junction
  - Reverse current : 5 $\mu$ A at T<sub>A</sub>= 25<sup>0</sup>c, 50 $\mu$ A at T<sub>A</sub>= 100<sup>0</sup>c
  - Peak forward surge current : 30A
  - Peak repetitive Reverse voltage : 1000V
  - Power dissipation : 3W maximum.
  - Total Capacitance : 15 PF at V<sub>R</sub>=4.0 V and F=1.0MHZ
- For Zener Diodes
  - Zener Diodes Used : Two Nos.
  - Zener Voltage : 5.6V and 6.2V  $\pm 10\%$
  - Forward Voltage Drop : 1.2V at T<sub>A</sub>= 25<sup>0</sup>c
  - Surge current : 810 - 730mA at T<sub>A</sub>= 25<sup>0</sup>c,
  - Maximum Regulator current : 162mA at T<sub>A</sub>= 50<sup>0</sup>c
  - Reverse leakage current : 10 $\mu$ A at T<sub>A</sub>= 25<sup>0</sup>c
  - Power dissipation : 1W maximum
  - Junction Temperature : 200<sup>0</sup>c
  - Maximum Dynamic Impedance : 700  $\Omega$  at T<sub>A</sub>= 25<sup>0</sup>c
- For Schottky Diode
  - Diodes Used : One Schottky Diode-Si type
  - Input Signal Frequency : Sine wave 2MHz max
  - Forward current : 1A
  - Junction Temperature : -65 to +125<sup>0</sup>c
  - Forward Voltage Drop : 1.0 V @
  - Power dissipation : 1W maximum
- For Light Emitting Diode (LED)
  - Diodes Used : Light Emitting Diodes (LEDs)
  - Total LEDs Used : One
  - LED color : Red
  - LED Diameter : 5mm
  - Front : Convex
  - LED Current : 10mA
  - Operating Voltage : 2V
  - Viewing angle : 40<sup>0</sup>
  - Maximum Forward Current : 25mA
- For Varactor Diode
  - Diodes Used : Varactor Diode (01 No.)
  - Capacitance Ratio : High
  - Maximum Reverse Voltage : 12V
  - Power dissipation : 1W maximum



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- Weight : 3.0 kg (approx)
- Dimensions (mm) : L 245 x W 320 x H 115
- Interconnections : 2mm Banana sockets
- Operating Temperature : 0-50°C, 80% RH

### Learning Scope

- To Study and Plot Forward & Reverse characteristics of Silicon and Germanium PN Junction Diodes.
- To Determine Forward static & dynamic resistance of diode at a given operating point.
- To Study and plot the Forward & Reverse characteristics of Zener Diodes.
- To Determine the Zener Voltage  $V_z$  from the reverse characteristics of Zener Diode.
- To Study and plot the characteristics of Schottky Diode. To Study the rectification characteristics of Schottky Diode with respect to change in Input Signal frequency upto 2MHz.
- To Study Forward characteristics of Red, Yellow and Green colors Light Emitting Diodes (LED).
- To Observe & Note the Change in the Intensity & Voltage across LEDs w.r.t. applied forward Voltage.
- To Study the V- I characteristics of Varactor Diode. To Observe & Note the change in Capacitance C with respect to change in applied reverse Voltage across Varactor Diode.

### Other Instruments Required

Oscilloscope, Function Generator, Capacitance Meter or Digital Multimeter.

### Accessories Included

Set of Patch Cords and Details Instruction Manual