

BJT, JFET and MOSFET Biasing Methods

Model : SC-111

SINCOM SC-111 BJT,JFET and MOSFET Biasing Methods is a remarkable **All-In-One** simply designed trainer for the purpose to study NPN BJT Base biasing, N-Channel JFET Gate biasing and N-Channel Enhancement type MOSFET biasing methods and determine the various operational parameters with a wide range of components bank in a simple experimental way. The BJT base biasing methods includes Fixed Bias and Self Base/Voltage Divide Bias method with & without Emitter Resistor, Collector to Base Biasing methods. The N-Channel JFET Gate biasing methods includes JFET Gate Bias, Self Bias, Voltage Divider Bias, Source biasing methods. The N-Channel Enhancement type MOSFET includes Voltage Divider Bias, Drain to Gate (Feedback) biasing methods.

Features

- ❖ User friendly Design
- ❖ Separate Modules of BJT Base, JFET Gate and MOSFET Biasing circuits
- ❖ All-In-One BJT base, JFET gate and MOSFET biasing modules
- ❖ Easy selection of Various biasing methods
- ❖ Silicon NPN BJT TO-92, JFET TO-72 Low Power, MOSFET TO-220 Transistor packages
- ❖ Combinational Resistor Bank at BJT Base, JFET Gate and MOSFET Gate
- ❖ BJT Resistor Bank at Collector to Base and Emitter
- ❖ BJT Resistive Collector Load
- ❖ JFET Resistor Bank at Drain and Source
- ❖ MOSFET Resistor Bank at Drain and Source
- ❖ In-Built Dual Fixed regulated DC Power Supply
- ❖ Easy to select the different biasing resistors
- ❖ Facility to plot DC Load Line
- ❖ Very Easy for Operation
- ❖ Multi color Circuit Diagram is screen printed on the front of the white color acrylic board
- ❖ Enclosed in an attractive, light weight, High Quality, Poly Coated Australian Pine Wooden cabinet
- ❖ Facility to connect external Digital/Analog Voltmeter and Ammeter or Digital Meters
- ❖ 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	: 230V \pm 10%, 50Hz
▪ DC Power Supply	: IC Regulated Dual Fixed \pm 12V/500mA
▪ BJT Biasing Method	: Fixed Bias and Self Bias with & without Emitter Feedback, Collector to Base Bias
▪ JFET Biasing Method	: Gate Bias, Self Bias, Voltage Divider Bias & Source Bias
▪ MOSFET Biasing Method	: Drain to Gate (Feedback) Bias, Voltage Divider Bias
▪ For BJT Biasing	

- Transistor Type and Package : BJT-Silicon-NPN, TO-92 Package
- Transistor Used : One SL/CL100
- Transistor β : @170-180
- Transistor Configuration : CE mode
- BJT Junction Voltage : 0.7V
- Max. Collector Emitter Voltage : 12 VDC
- Combinational Base Resistor Bank : Four- MFR 100K Ω , 180K Ω , 10K Ω and 100K Ω , $\pm 5\%$
- Collector to Base Resistor Bank : Two Fixed-MFR 10K Ω & 22K Ω , $\pm 5\%$ and One Variable 1M Ω Potentiometer
- Emitter Resistor Bank : Two- MFR 180 Ω and 0 Ω , $\pm 5\%$
- Resistive Collector Load : 470 Ω for Fixed & Self bias, 2.2K Ω Collector to Base Bias

▪ **For JFET Biasing**

- Transistor Types and Package : JFET-N Channel,TO-72 Package
- JFET Used : BFW10
- Pin Count : 4 Gate, Drain Source and Substrate
- Transistor Configuration : CS mode
- Max. Drain Source Voltage : 12 VDC
- Combinational Gate Resistor Bank : Six Gate Resistors includes Four Fixed and Two Variable
- Fixed Gate Resistor Bank : Four Fixed-MFR 10K Ω (2 No.) & 100K Ω (2No.), $\pm 5\%$
- Variable Gate Resistor Bank : Two Variable 100K Ω Potentiometers
- Drain Load Resistor Bank : One Fixed-MFR 1K Ω , $\pm 5\%$ & Variable 100K Ω Potentiometer
- Source Resistor Bank : Fixed-MFR 100 Ω , 1K Ω and 0 Ω , $\pm 5\%$.
Variable 100K Ω Potentiometers

▪ **For MOSFET Biasing**

- Transistor Type and Package : MOSFET, N-Channel Enhancement, TO-220 Package
- MOSFET Used : IRF840/540
- Pin Count : 3 Gate, Drain and Source
- Transistor Configuration : CS mode
- Max. Drain Source Voltage : 12 VDC
- Combinational Gate Resistor Bank : Six Gate Resistors includes Four Fixed and Two Variable
- Fixed Gate Resistor Bank : Four Fixed-MFR 10K Ω (2No) & 100K Ω (2No), $\pm 5\%$
- Variable Gate Resistor Bank : Two Variable 100K Ω Potentiometers
- Drain Load Resistor Bank : One Fixed-MFR 1K Ω , $\pm 5\%$ & Variable 100K Ω Potentiometer
- Source Resistor Bank : Fixed-MFR 100 Ω , 1K Ω and 0 Ω , $\pm 5\%$.
Variable 100K Ω Potentiometers

- Weight : 3.0 kg (approx)
- Dimensions (mm) : L 270 x W 390 x H 130
- Interconnections : 2mm Banana sockets
- Operating Temperature : 0-50 $^{\circ}$ C, 80% RH



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Learning Scope

- To study the need of Biasing circuits.
- To study BJT Fixed Bias circuit with & without Emitter feedback Resistor.
- To study BJT Collector to Base Biasing circuit.
- To study BJT Self Bias/Voltage Divider biasing circuit. To observe & Note the change in Collector Current & Voltage w.r.t. change in biasing resistors.
- To Determine the various currents & voltages, $I_B, I_C, V_B, V_C, V_{CE}, V_E$ and Stability factor
- To Plot DC load line & observe change w.r.t. change in base resistor & emitter feedback resistor bank
- To study the JFET Gate Bias, Self Bias, Voltage Divider Bias and Source Bias circuits.
- To study the MOSFET Gate Bias, Voltage Divider Bias and Drain to Gate (Feedback)Bias circuits.
- To Observe & Note the change in Drain Current w.r.t. change in Biasing Resistors.

Other Instruments Required

SINCOM Digital Multi VI meter (DMVI) : Model DMVI-03 Range V_1 -20V, I_1 -20mA, V_2 -20V, I_2 -200mA DC

Accessories Included : Set of Patch Cord and Details Instruction Manual