

EXPERIMENT NO : ⁸⁾ 11

8) MOSFET & IGBT

Switching Dynamic

AIM: To study the ~~static~~ characteristics of IGBT.

EQUIPMENTS REQUIRED:

1. Step down transformer
2. Switching characteristics module
3. CRO
4. Patch chords

PROCEDURE:

1. Connect the oscillator output T1 to input T2 of base drive circuit of IGBT.
2. Set the output frequency of the oscillator (switching frequency) either at 2 KHz or at 4 KHz by using the switch SW1. Observe the output waveforms of oscillators on a CRO at T1.
3. Connect the RL Load across the diode and connect the load terminal L2 to connector terminal of the IGBT.
4. Connect the output of the base drive circuit of IGBT to the gate terminal G1 of the IGBT.
5. Connect L1 to +24V DC power supply. Negative terminal of DC power supply is connected to the Ground terminal.
6. Switch ON the main supply.
7. Observe the waveforms in following sequence.

a) Gating signal and the current flow through the device.

To observe these waveforms, connect the CRO ground terminal at the drain and the channel 2 probe at the GND. (across the current sensing resistor). Connect channel 1 probe at the gate of the input transistor.

Now measure the turn-on delay, rise time, fall time, turn-off delay time, storage time by expanding the time base of the CRO.

b) Now observe the voltage and current waveforms of the device.

For this, remove the CRO channel 1 probe from the base and connect it to the source terminal of the transistor.

8. Plot these waveforms on a graph sheet, mark turn-on, turn-off time on this graph sheet.
9. Tabulate the measured values of turn-on and turn-off timings in Table-1

AIM: To study the static characteristics of MOSFET.

EQUIPMENTS REQUIRED:

1. Step down transformer
2. Switching characteristics module
3. CRO
4. Patch chords

PROCEDURE :

1. Connect the oscillator output T1 to input T2 of base drive circuit of MOSFET.
2. Set the output frequency of the oscillator (switching frequency) either at 2 KHz or at 4 KHz by using the switch SW1. Observe the output waveforms of oscillators on a CRO at T1.
3. Connect the RL Load across the diode and connect the load terminal L2 to drain terminal (D) of the MOSFET.
4. Connect the output of the base drive circuit of MOSFET to the gate terminal F2 of the MOSFET.
5. Connect 4 to +24V DC power supply. Negative terminal of DC power supply is connected to the Ground terminal.
6. Switch ON the main supply.
7. Observe the waveforms in following sequence.

a) Gating signal and the current flow through the device.

To observe these waveforms, connect the CRO ground terminal at the drain and the channel 2 probe at the GND. (across the current sensing resistor). Connect channel 1 probe at the gate of the input transistor.

Now measure the turn-on delay, rise time, fall time, turn-off delay time, storage time by expanding the time base of the CRO.

b) Now observe the voltage and current waveforms of the device.

For this, remove the CRO channel 1 probe from the base and connect it to the source terminal of the transistor.

8. Plot these waveforms on a graph sheet, mark turn-on, turn-off time on this graph sheet.
9. Tabulate the measured values of turn-on and turn-off timings in Table-2

TABLE – 2

Sl. NO	Frequency position	Turn-on time	Turn-off time