

## EXPERIMENT 7

**OBJECT :** To test the isolated gate drivers for transistor-transistor logic (TTL) pulses to the MOSFET bridge module by varying the pulse width.

### APPARATUS REQUIRED:

1. Isolated driver module
2. C.R.O. with probes
3. Digital multimeter

### THEORY:

For operating MOSFETs as switches, an appropriate gate voltage must be applied to drive the transistors into saturation mode for low on-state voltage. The control voltage should be applied between the gate and source terminals. The power converters generally require multiple transistors and each MOSFET must be gated individually.

There are two ways of floating or isolating the control or gate signal with respect to ground.

1. Pulse transformers.
2. Optocouplers.

Optocouplers combine an infrared LED and a silicon phototransistor. The input signal is applied to the ILED and the output is taken from the phototransistor.

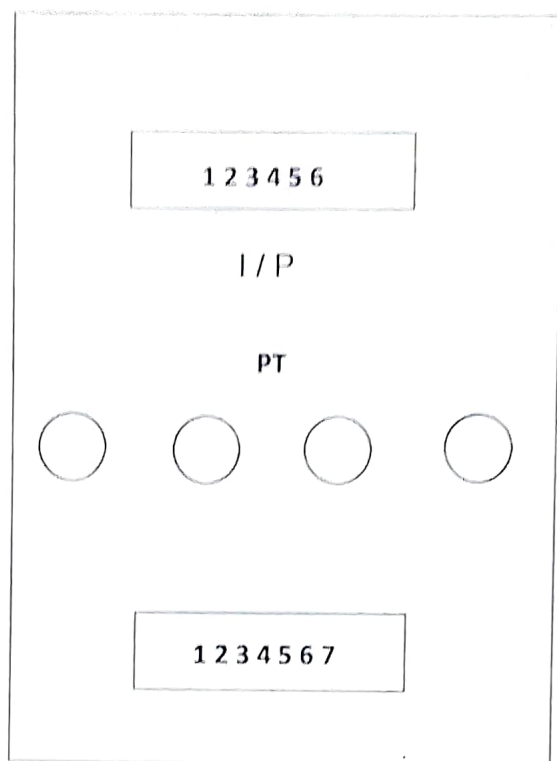
### ABOUT THE CARD:-

The module consists of 3 blocks as Buffer, Opto isolators and driver amplifiers. A connector is provided on the card. Here 555 timer is used as astable multivibrator. It generates clock pulse which are given to the input of Jk flip flop 7476, which gives Q and Qbar(Phase shifted 180 degree) These input signals are given to buffer block (consisting of IC 324), where they are current boosted and further passed to the Opto-isolator blocks where isolation between different input signals is achieved. MCT-2E is used as a Opto-isolator.

The four isolated signals are further given to driver amplifier section where they are amplified to 12 volts. An isolation transformer with 4 windings of 12 V, 100 mA is used. 12 V AC from the 4 secondaries of the transformer are rectified and filtered and are used for the driver amplifiers (TIP 122) for biasing purpose.

The four amplified and isolated signals are taken out on the 8-pin O/P connector for user to connect the pulses to the MOSFET Bridge. User should properly check the phase

shift between the pulses before connecting the pulses to the bridge according to the O/P requirement.



ISOLATED PULSE AMPLIFIER

### PROCEDURE:-

1. Connect mains cord & switch on the Mains supply.
2. Observe All tests points as per following chart given on C.R.O. one by one

### Test Points

- |                  |                                                 |
|------------------|-------------------------------------------------|
| 1. +5V wrt gnd : | supply voltage for ICs                          |
| 2. A wrt gnd :   | Q +5V(output of 7476 flip flop)                 |
| 3. B wrt gnd :   | Qbar +5V(output of 7476 flip flop)              |
| 4. C wrt gnd :   | Qbar +5V(output of 7476 flip flop)              |
| 5. D wrt gnd :   | Q +5V(output of 7476 flip flop)                 |
| 6. G1 wrt S2 :   | Isolated and amplified driver signal of A (Q)   |
| 7. G3 wrt S4 :   | Isolated and amplified driver signal of B(Qbar) |
| 8. G5 wrt S6 :   | Isolated and amplified driver signal of C(Qbar) |

9. G7 wrt S8 :

Isolated and amplified driver signal of D(Q)

TEST WAVEFORMS:-

