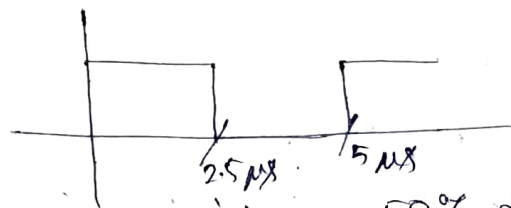


$$V_{DSS} = 1200V, R_{G(ON)} = 1.8\Omega, f = 100kHz \text{ (Designed till } 200kHz, \text{ incase you can increase frequency)}$$

$$T_s = 5\mu s$$



considering 50% duty cycle.

### ① Propagation delay -

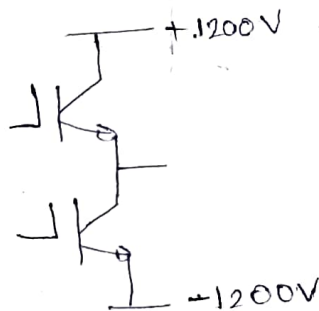
① turn off + turn-off (delay)  $\approx 100ns$ .

Dead-time should be greater than  $100ns$ .

②  $(2-5)\%$  of  $T_s/2 = 125ns$

Propagation delay should be less than this.

②



Max. voltage surge possible during switching =  $2400V$

$$t_{d(ON)} + t_r \approx 37ns$$

$$\therefore \frac{2400V}{37ns} = 64.8V/ns = 64.8kV/\mu s$$

CMTI should be greater than this.

### ③ Working Isolation voltage

$$V_{IOWM} \approx 1.2 \text{ times } V_{DSS} \approx 1500V$$

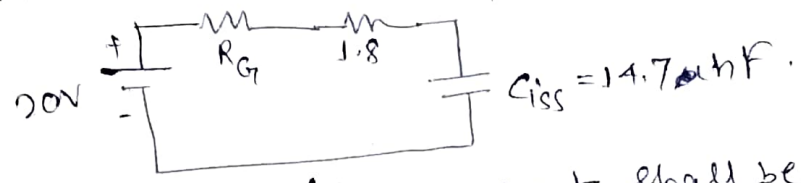
$$V_{IOWM} \geq 1500V$$

④ Output side ( $V_{CC2} - V_{EE2}$ ) larger; the better, as wide voltage range ~~at~~ shall be fruitful to drive the MOSFET. Typical range  $\rightarrow 20$  to  $40V$ .

⑤ Isolation type  $\rightarrow$  Transformer best for HF

⑥  $I_{G|PK} = \frac{15 - (-5)}{1.8} = \frac{20}{1.8} = 11.11 A$

Appropriate <sup>external</sup> resistor may be connected in series.



Also, source/sink current shall be in this range.

⑦  $P_{gate|max} = V_{GS} \times Q_g \times f_s = 20 \times 0.5 \mu C \times 200 \text{ kHz} = 2 W$

Based on these:

For Device - FF6MR12W2M1HB70BPSA1 |  $Q_g = 289 \text{ nC}$

GD part No - 2EDR8259H

- ① Propagation delay = 38 ns.
- ② Can handle freq till 500 kHz.
- ③  $V_{TOWM} = 1800 V$  (continuous)
- ④  $V_{CC2} - V_{EE2} = 22 V$
- ⑤ Source/sink current = 5 A / 9 A.
- ⑥  $CMVTI = 150 \text{ kV}/\mu s$ .
- ⑦  $t_{tr} = 14 \text{ ns}$  (maximum)

Other advantages:

- Ⓐ Active Miller Clamp.
- Ⓑ Shoot through
- Ⓒ Dead time control.

Similarly for,

Device — 1MW120R007M1HXKSA1 (Discrete) :

G.D —	1ED <sup>3</sup> 12XMU12F	1ED31XXMC12H.
① Propagation delay	100 ns	100 ns
② Frequency handling capability.	1 MHz	1 MHz
③ Isolation type	Transformer based	Transformer based
④ $V_{IOWM}$	$\approx 1800V$	$\approx 1800V$ (continuous)
⑤ $V_{CE2} - V_{EE2}$	35 V	40 V
⑥ Source/sink current	10 A	14 A
⑦ CMTI	200 kV/μs	200 kV/μs
⑧ Gate power loss ( $Q_g = 289$ nC)	1.156 W	1.156 W
⑨ <del>Act</del> Other Remarks.	under voltage lockout, short ckt. clamp. Active miller clamp	— Same —