Calculation

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- Input Voltage - 0.2 to 0.5 Volt, That is Peak to Peak Voltage.
- NE555 Set as astable Mode for 100kHz freqn.

$C = 1nf$
$R_1 = 2.2k\Omega$
$R_2 = 5k\Omega$

- Because $T = 0.7(R_1 + 2R_2) \times C$
  Need $f = 100kHz$ $\therefore T = 10^{-5}$ sec
- For Intigrator

$$\text{Gain} = \frac{1}{j2\pi f . R_1 . Cf}$$

Gain = 1 hence,
$R_1 . Cf = 1.59 \times 10^{-5} s$
$R_1 = 10k\Omega$
$Cf = 1.2nf$.

- For MOSFET Need
  - $V_{gs} > V_{th}$ Need.

for that → $V_{gs} = V_{gate} - V_{source}$

For high side N-MOSFET
V_{source} = output = 0 to 12 Volt

For that high side N-MOSFET Need to Vgs Voltage highes than 12 Volt.
That's why we added Bootstrap Circuit.

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Make gate Voltage Greater than 12V.

Add Bootstrap.

- low pass filter -

$F_{pwm} = 100kHz$ But After low pass filter

we get $f_c = 30kHz$, $R_L = 8\Omega$

then $L = \frac{R_L}{2\pi f_c}$

$L = 42.44\mu H$ $\underline{L \approx 47\mu H}$

&

$C = \frac{1}{(2\pi f_c)^2 R_L}$

$\underline{C = 2.2\mu F}$

Hence we get $\underline{5(Watt)}$ output.