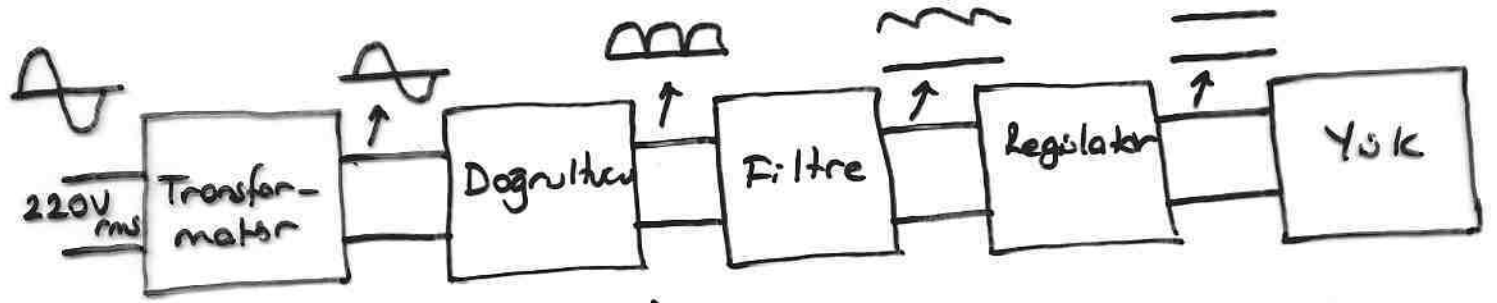
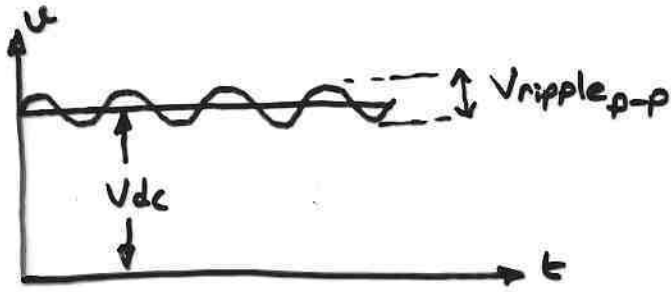


GÜÇ KAYNAKLARI (Voltaaj Regülatörleri)



Güç Kaynağı Blok Diyagramı



$$r = \frac{\text{ripple voltağı (rms)}}{\text{dc voltağı}}$$

$$\% r = \frac{V_r(\text{rms})}{V_{dc}} \times 100\%$$

Doğrultulmuş sinyalin Ripple Faktörü

Yarım Dalga Doğrultucu çıkışı için;

dc çıkış voltağı;

$$V_{dc} = 0,318 V_m \quad V_m \rightarrow \text{peak değeri}$$

çıkıştaki ac bileşenin rms değeri;

$$V_{r_{rms}} = 0,385 V_m$$

Ripple Faktörü;

$$\% r = \frac{V_r(\text{rms})}{V_{dc}} \times 100 = \frac{0,385 V_m}{0,318 V_m} \times 100 = \boxed{\% 121}$$

Tem Dalga Doğrultucu çıkışı için;

dc çıkış voltağı;

$$V_{dc} = 0,636 V_m$$

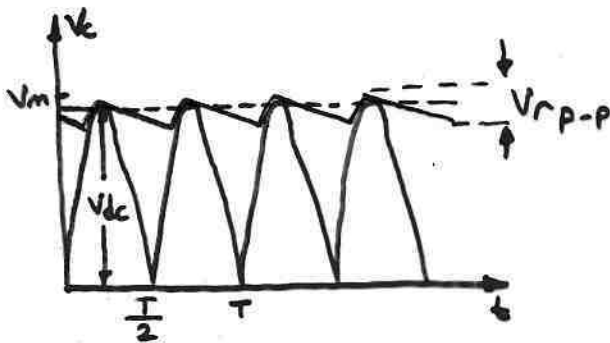
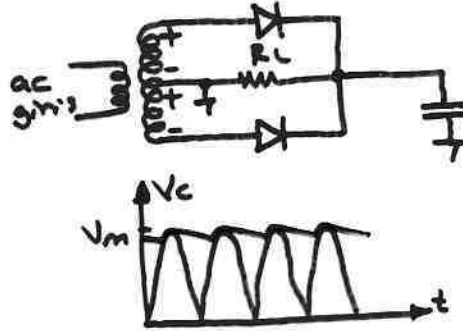
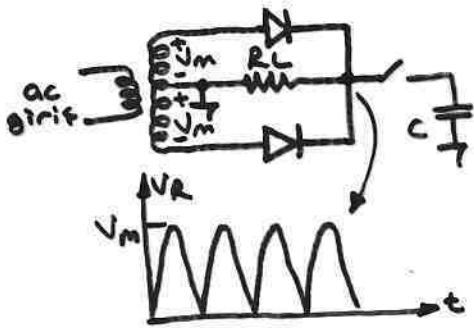
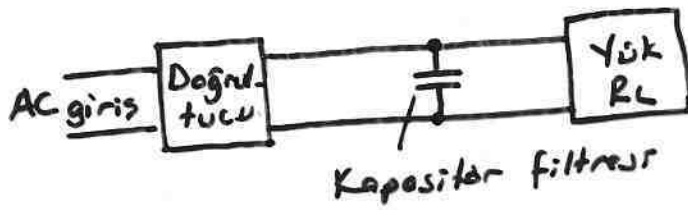
çıkıştaki ac bileşenin rms değeri;

$$V_{r_{rms}} = 0,308 V_m$$

Ripple Faktörü;

$$\% r = \frac{V_r(\text{rms})}{V_{dc}} \times 100 = \frac{0,308 V_m}{0,636 V_m} \times 100 = \boxed{\% 48}$$

KAPASİTÖR FİLTRESİ



$$V_{r_{rms}} = \frac{I_{dc}}{4\sqrt{3}fc} = \frac{2,4I_{dc}}{C} = \frac{2,4V_{dc}}{R_L \cdot C}$$

$$I_{dc} = mA$$

$$R_L = k\Omega$$

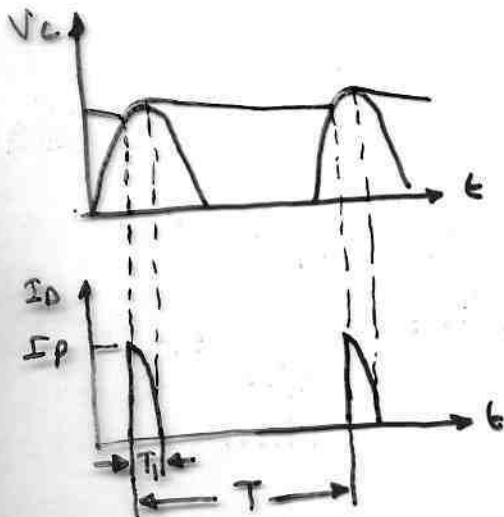
$$C = \mu F$$

$$V_{dc} = V_m - \frac{I_{dc}}{4fc} = V_m - \frac{4,17I_{dc}}{C}$$

Kapasitör filtresi Ripple Faktörü:

$$\%r = \frac{V_r(rms)}{V_{dc}} \times 100 = \frac{2,4I_{dc}}{C V_{dc}} \times 100 = \frac{2,4}{R_L C} \times 100$$

Diğer iletim periyodu ve peak diyet akımı;



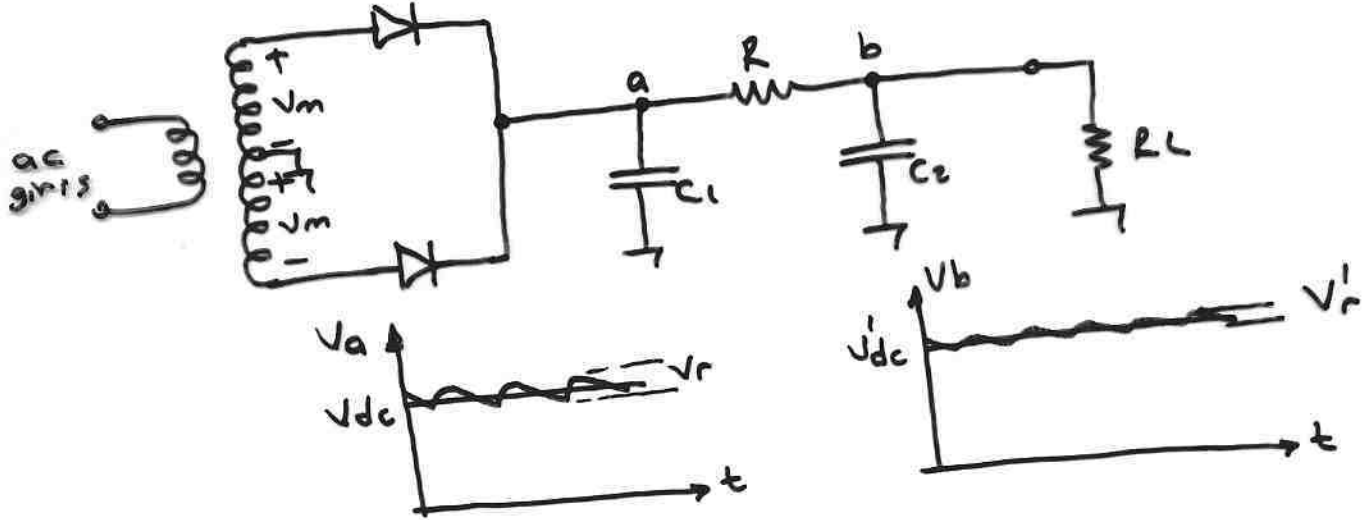
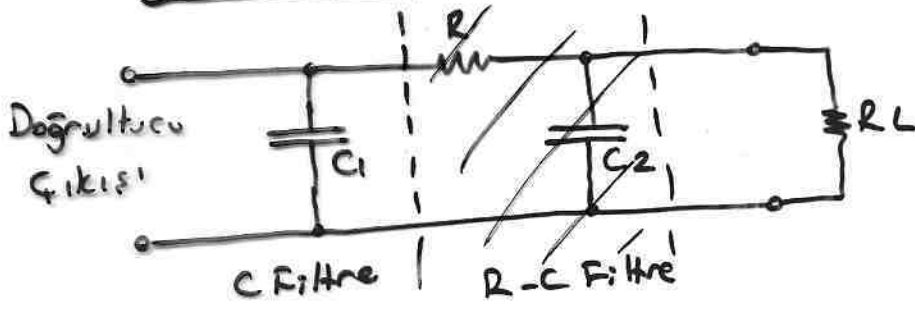
$$I_{dc} = \frac{T_i}{T} I_{peak}$$

$$I_{peak} = \frac{T}{T_i} I_{dc}$$

$T_i \rightarrow$ diyet iletim periyodu

$T \rightarrow \frac{1}{f}$ (f ton dalga ıřın $2 \times 50 = 100$)

RC Filtre

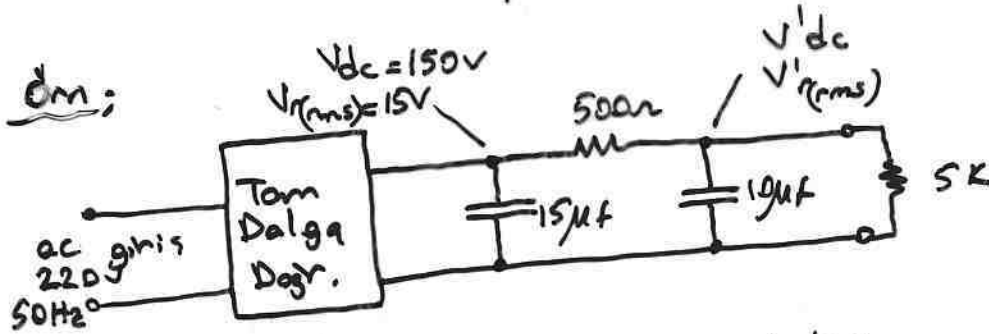


b noktasındaki dc voltajı;
(dc'de kondansatörler açık devre)

$$V'_{dc} = \frac{R_L}{R + R_L} \cdot V_{dc}$$

b noktasındaki Ripple voltajı;

$$V'_{rms} \approx \frac{X_C}{R} V_{rms}$$



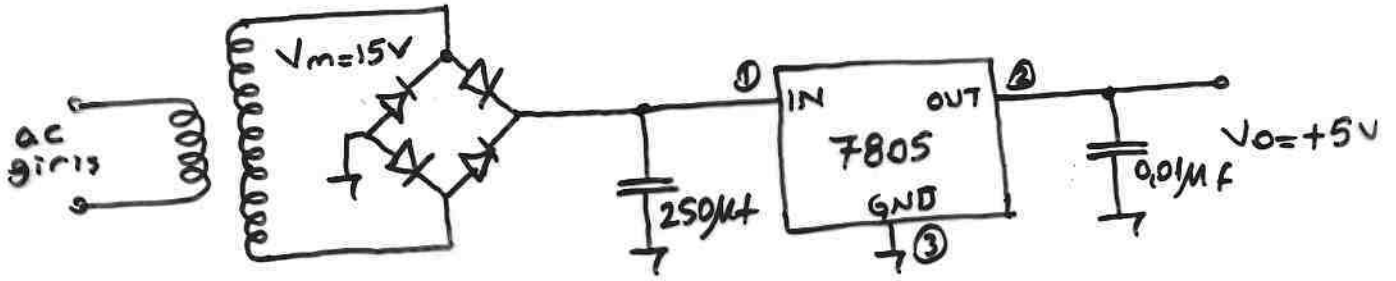
$$V'_{dc} = \frac{5K}{500\Omega + 5K} \cdot 150V = 136,4V$$

$$X_C = \frac{1}{2\pi f C} = 159,2\Omega$$

$$V'_{r(rms)} = \frac{159,2}{500} \cdot 15V = 4,77V$$

$$\%r = \frac{V'_{r(rms)}}{V'_{dc}} \times 100 = \frac{4,77V}{136,4V} \times 100 = \%3,5$$

IC Voltaj Regulatorları

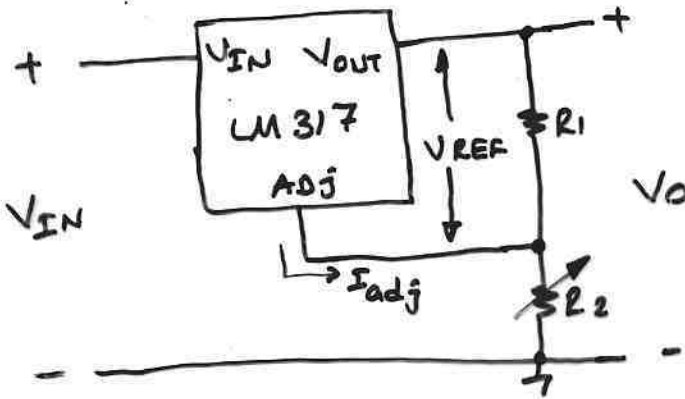


$$V_{r\text{peak}} = \sqrt{3} V_{r\text{rms}}$$

$$V_{dc} = V_m - V_{r(\text{peak})}$$

$$V_{i\text{low}} = V_{dc} - V_{r(\text{peak})}$$

Ayarlanabilir Voltaj Regulatorları



$$V_O = V_{ref} \left(1 + \frac{R_2}{R_1}\right) + I_{adj} R_2$$

Tipik değerler;

$$V_{ref} = 1,25V$$

$$I_{adj} = 100\mu A$$

Örne Yukarıdaki devrede $R_1 = 240\Omega$ $R_2 = 2,4K$ ise ;
regüle edilen çıkışı bulunuz.

$$V_O = 1,25V \left(1 + \frac{2,4K}{240\Omega}\right) + 100\mu A \cdot 2,4K$$

$$\underline{V_O = 13,99V}$$