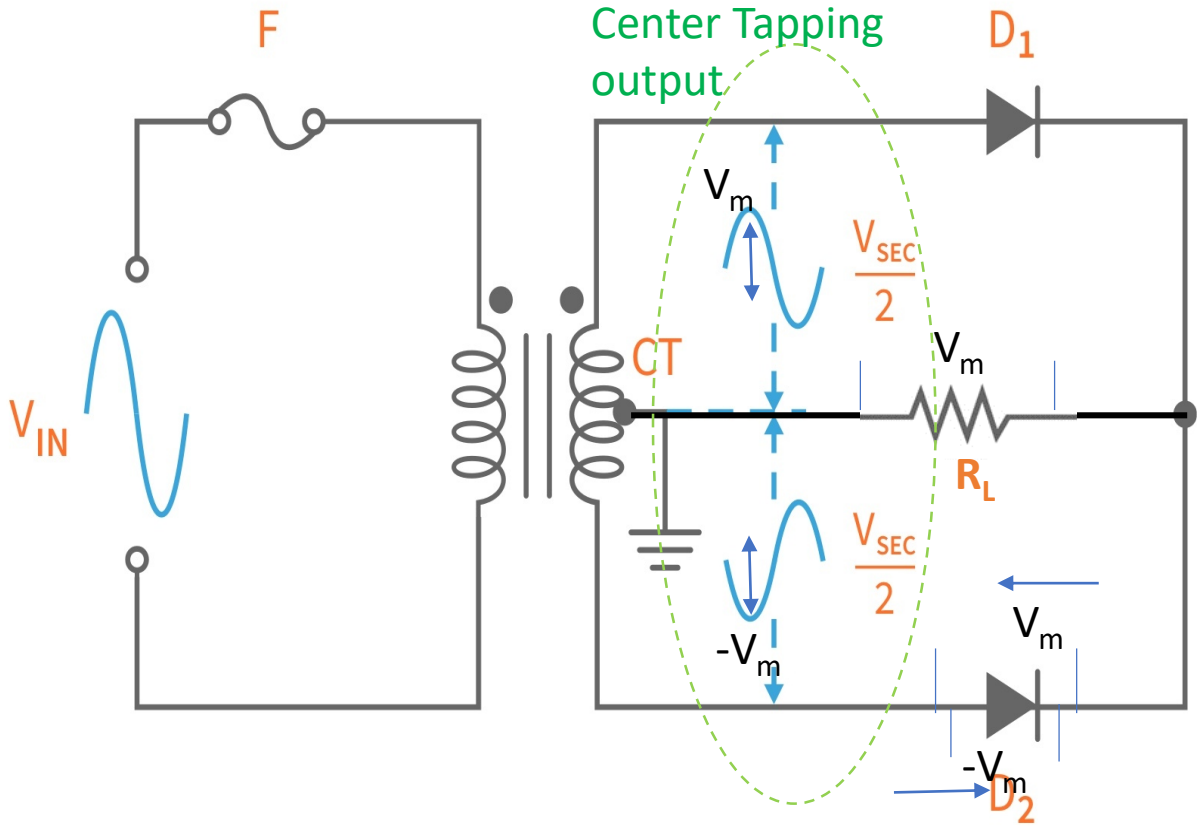
Full Wave Center Tapped Rectifier – Device Parameter

(ii) Peak Inverse Voltage of a Diode

The anode voltage of the diode D_1 is + V_m (where V_m is the maximum half secondary voltage) and the anode voltage of D_2 is $-V_m$. Since D_1 is forward biased, its cathode is at the same voltage as its anode (neglecting barrier potential) i.e., + V_m. This is also the voltage on the cathode of the diode D_2. The total reverse voltage across the diode D_2 is : = $V_m - (-V_m) = 2V_m$. Therefore, Peak–inverse voltage of each diode in a center-tapped full-wave rectifier,

$$PIV = 2V_m$$

PIV: When the diode is not conducting, the peak value of the reverse voltage applied across the diode



Here during 1st half cycle, because of center tapping $+V_m$ is the peak voltage drop across the parallel network D_1 R_L and D_2 (in parallel network voltage drop across the resistances will be same). During the 1st half cycle D_2 is the non conducting diode. At this instance, in addition to V_m, the reverse bias peak voltage $-V_m$ is the voltage drop across D_2 opposite to that of V_m. Thus the total PIV across D_2 is $V_m - (-V_m) = 2V_m$