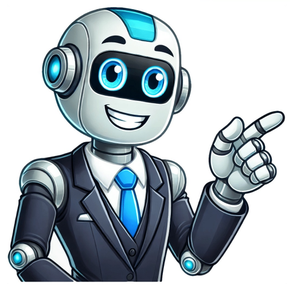
Click to verify



This bridge rectifier calculator can estimate four parameters of the rectification. If you select... 1. DC voltage (VDC) option:Resultant output waveform.Just input the peak AC voltage (VPEAKV_{PEAK}VPEAK), and the calculator computes the DC voltage (VDCV_{DC}VDC) for you. If you would like to calculate it on your own, you can use the formula below:VDC=2·VPEAKπ\quad V_{\rm DC} = \frac{2 \cdot V_{\rm PEAK}} {\pi}VDC=π2·VPEAK Let us use the term ViV_iVi to designate the voltage coming from the secondary windings of the transformer (or input voltage):Vi=VM·sin(2π f T)\quad V_{i} = V_{\rm M} \cdot \sin(2π \, f\, T)Vi=VM·sin(2πfT)Using Ohm's law to derive the current, we should note that two types of resistance will limit the current, the load resistance (RL), and the forward resistance of the diode (Rf). Note: We can find the forward resistance using the diode's I-V characteristic. The current option asks you to enter the following: Enter the load resistance RLR_{\rm L}RL. Enter the forward resistance of the diodes RFR_{\rm F}RF. Input the maximum AC voltage VMV_{\rm M}VM. And this calculator computes the current IMI_{\rm M}IM using the equation below:IM=VM(2Rf+RL)\quad I_{\rm M} = \frac{V_{\rm M}}{(2R_f + R_{\rm L})}IM=(2Rf+RL)VM This bridge rectifier calculator computes the RMS (root mean square) current (IRMSI_{\rm RMS}IRMS) from IMI_{\rm M}IM as shown below:IRMS=IM2\quad I_{\rm RMS} = \frac{I_{\rm M}}{\sqrt2}IRMS=2IM It computes the ripple factor of the output waveform as the ratio of the ripple current (also known as the RMS current) to the DC current.Ripple factor=(IRMSIDC)2−1\small \text{Ripple factor} = \sqrt{\Big(\frac{I_{\rm RMS}}{I_{\rm DC}}\Big)^2 - 1}Ripple factor=(IDCIRMS)2−1If you enter RMS current (I_RMS) and the DC current (I_DC), this calculator gives you the ripple factor. Enter the input AC voltage to the bridge rectifier to determine the approximate output DC voltage. This calculator accounts for the voltage drop across the diodes in the rectifier. Rectifier Voltage Calculator Output Voltage Calculator The following formula is used to calculate the output DC voltage of a bridge rectifier. Variables: Vdc is the output DC voltage Vrms is the input AC voltage (root mean square voltage) Vd is the forward voltage drop across each diode (typically 0.7V for silicon diodes) To calculate the output DC voltage, multiply the input AC voltage by the square root of 2 and then subtract the voltage drop across two diodes (2 * Vd). A bridge rectifier is an electrical circuit consisting of four diodes arranged in a bridge configuration that converts alternating current (AC) to direct current (DC). It is widely used in power supply units where a stable DC voltage is required. The bridge rectifier is preferred over other types of rectifiers due to its ability to provide full-wave rectification and higher output voltage. The following steps outline how to calculate the Bridge Rectifier Output Voltage. First, determine the input AC voltage (Vrms) supplied to the bridge rectifier. Next, consider the typical forward voltage drop across each diode (Vd), which is usually around 0.7V for silicon diodes. Use the formula Vdc = Vrms * √2 – 2 * Vd to calculate the output DC voltage (Vdc). Finally, calculate the Bridge Rectifier Output Voltage (Vdc). After inserting the variables and calculating the result, check your answer with the calculator above. Example Problem : Use the following variables as an example problem to test your knowledge. Input AC voltage (Vrms) = 120V Forward voltage drop across each diode (Vd) = 0.7V Output DC voltage (Vdc) = ?