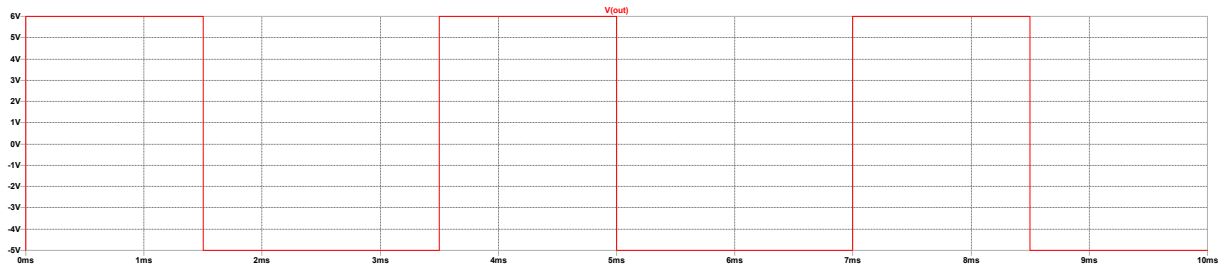


Effektivwert einer unsymmetrischen Rechteckspannung 1,5ms ($u_1 = 6V$) und 2ms ($u_2 = -5V$)



$$U_{RMS} = \sqrt{\frac{1}{T} \int_0^T u^2 dt} = \sqrt{\frac{1}{T} \left(\int_0^{\frac{3T}{7}} u_1^2 dt + \int_{\frac{3T}{7}}^T u_2^2 dt \right)}$$

$$U_{RMS} = \sqrt{\frac{1}{T} \left([u_1^2 t]_0^{\frac{3T}{7}} + [u_2^2 t]_{\frac{3T}{7}}^T \right)} = \sqrt{\frac{1}{T} \left[\left(\frac{3u_1^2 T}{7} - u_1^2 \times 0 \right) + \left(u_2^2 \times T - \frac{3u_2^2 T}{7} \right) \right]}$$

$$U_{RMS} = \sqrt{\frac{1}{T} \left[\frac{3u_1^2 T}{7} + u_2^2 \times T - \frac{3u_2^2 T}{7} \right]} = \sqrt{\frac{1}{T} \left[\frac{3 \times 6^2 \times T}{7} + (-5)^2 \times T - \frac{3 \times (-5)^2 \times T}{7} \right]}$$

$$U_{RMS} = \sqrt{\frac{1}{T} \left[\frac{108T}{7} + 25T - \frac{75T}{7} \right]} = \sqrt{\frac{1}{T} \left[\frac{108T}{7} + \frac{100T}{7} \right]} = \sqrt{\frac{1}{T} \times \frac{208T}{7}} = \sqrt{\frac{208}{7}} \approx \underline{5.45V}$$

Mit freundlichen Grüßen

Robert Siegler