Elektronica tutorial

Gemiddelde & effectieve waarden

W. Van Wichelen

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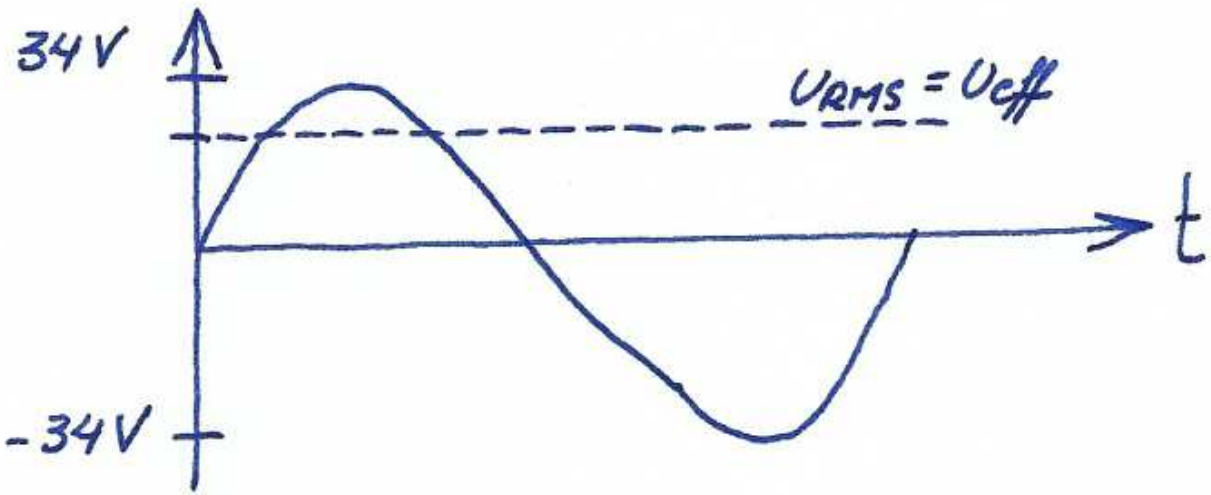
Gemiddelde & effectieve waarde

SINUSSPANNING



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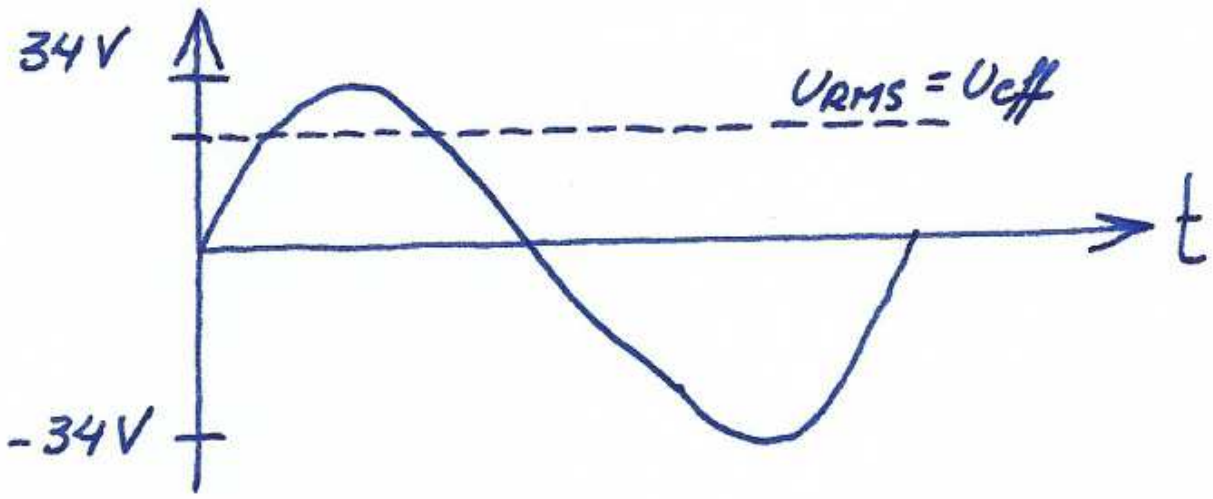
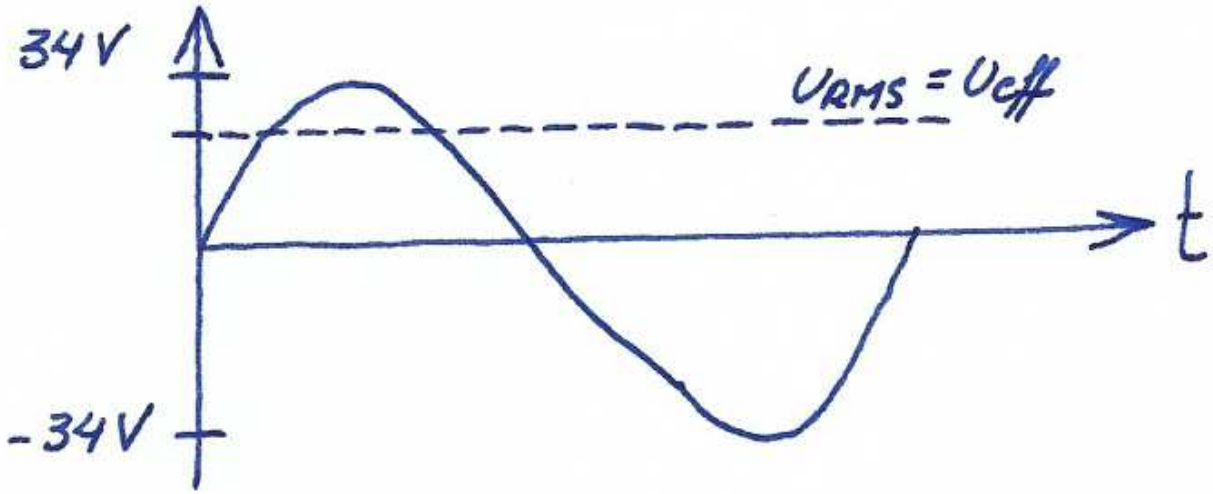
SINUSSPANNING



→ amplitude $U_p = 34\,V$

SINUSSPANNING



→ amplitude $U_p = 34\,V$

→ effectieve waarde $\boxed{U_{eff} = U_{RMS} = \frac{U_p}{\sqrt{2}}}$

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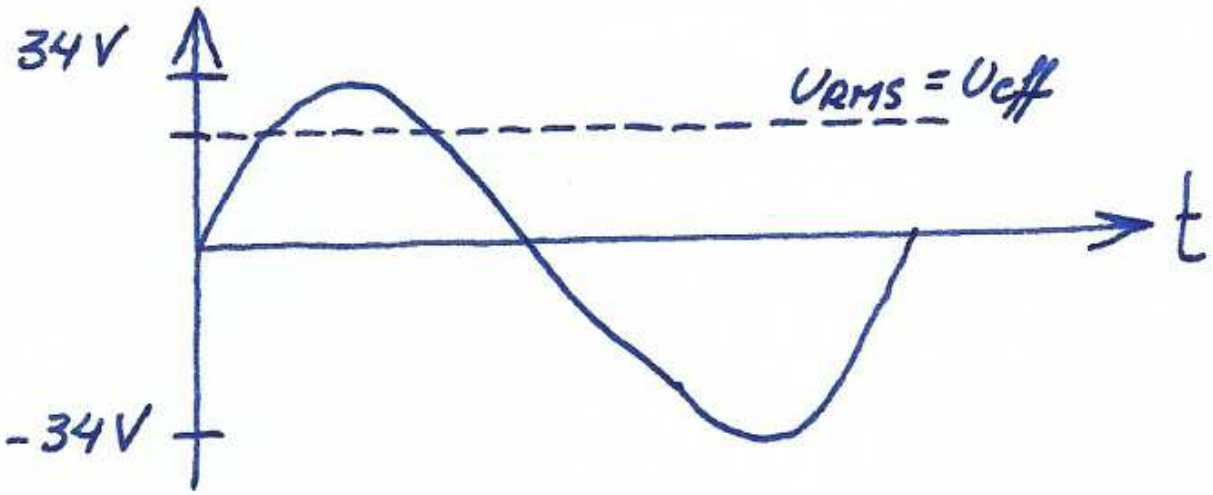
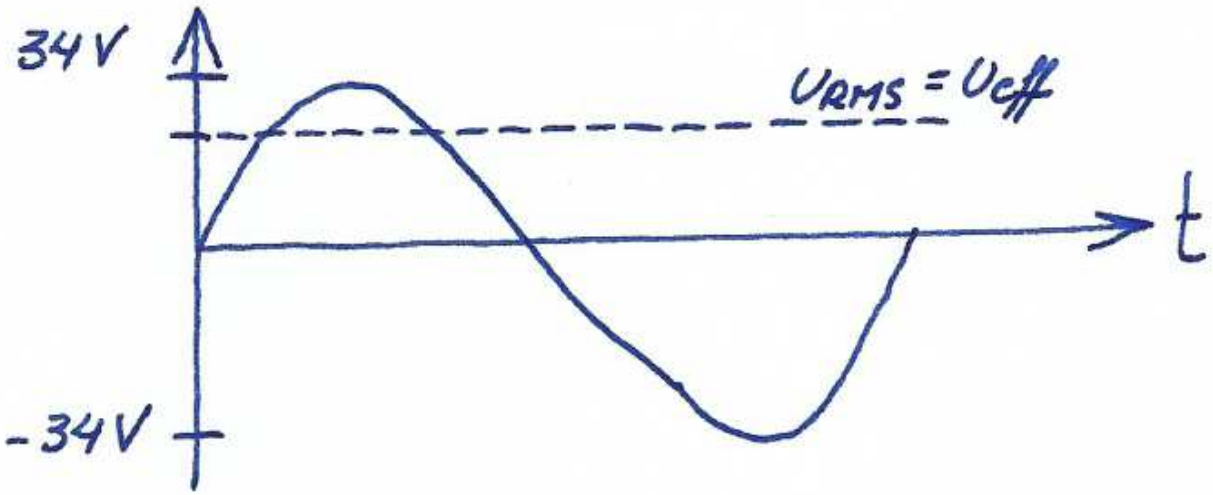


→ amplitude $U_p = 34\,V$

→ effectieve waarde $\boxed{U_{eff} = U_{RMS} = \frac{U_p}{\sqrt{2}}}$

→ $U_{eff} = \frac{34\,V}{\sqrt{2}} = 24\,V$



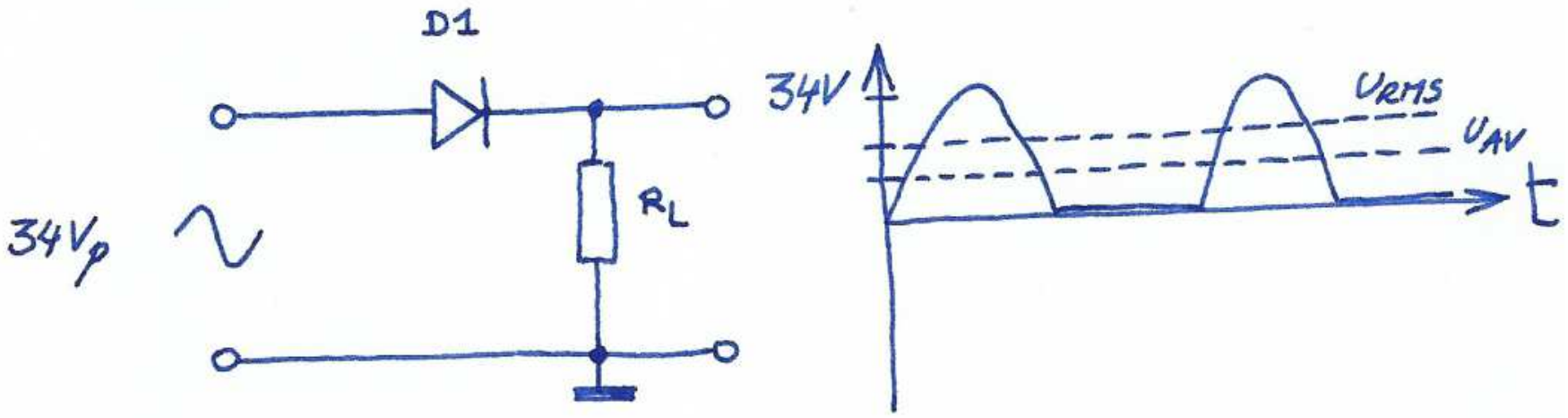
→ amplitude $U_p = 34\,V$

→ effectieve waarde $\boxed{U_{eff} = U_{RMS} = \frac{U_p}{\sqrt{2}}}$

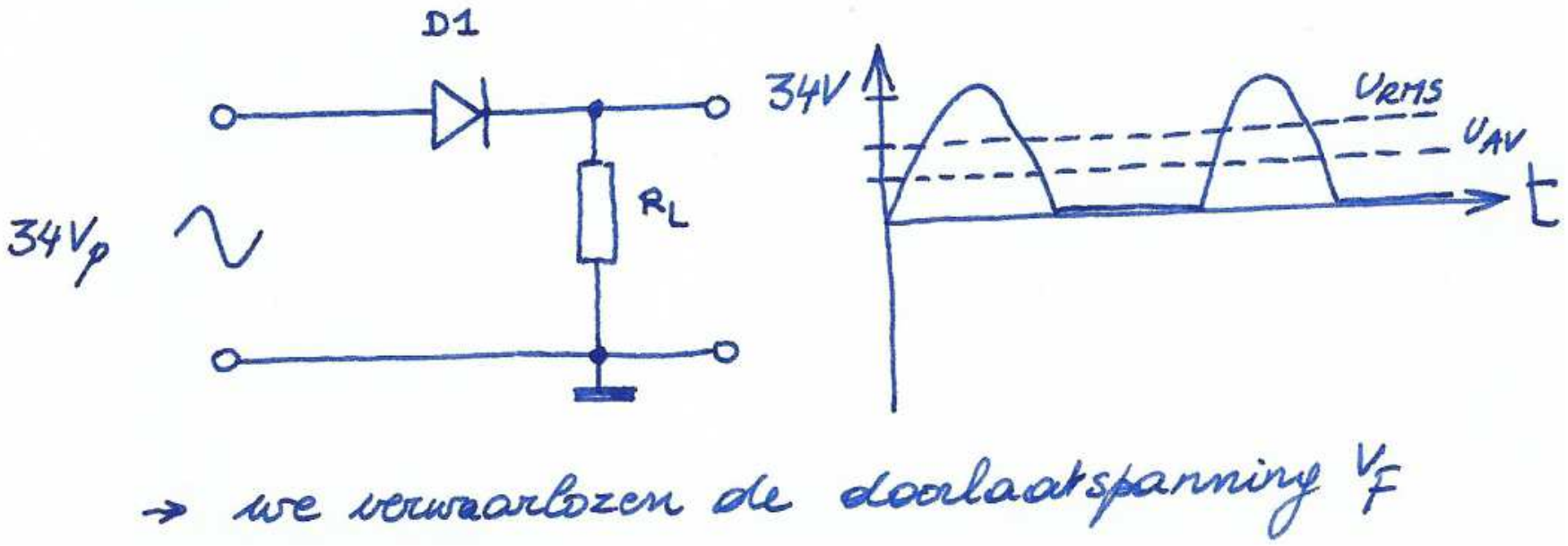
→ $U_{eff} = \frac{34\,V}{\sqrt{2}} = 24\,V$

→ gemiddelde waarde $U_{DC} = U_{AV} = 0\,V$

HALVE GOLF GELIJKGERICHTE SINUS

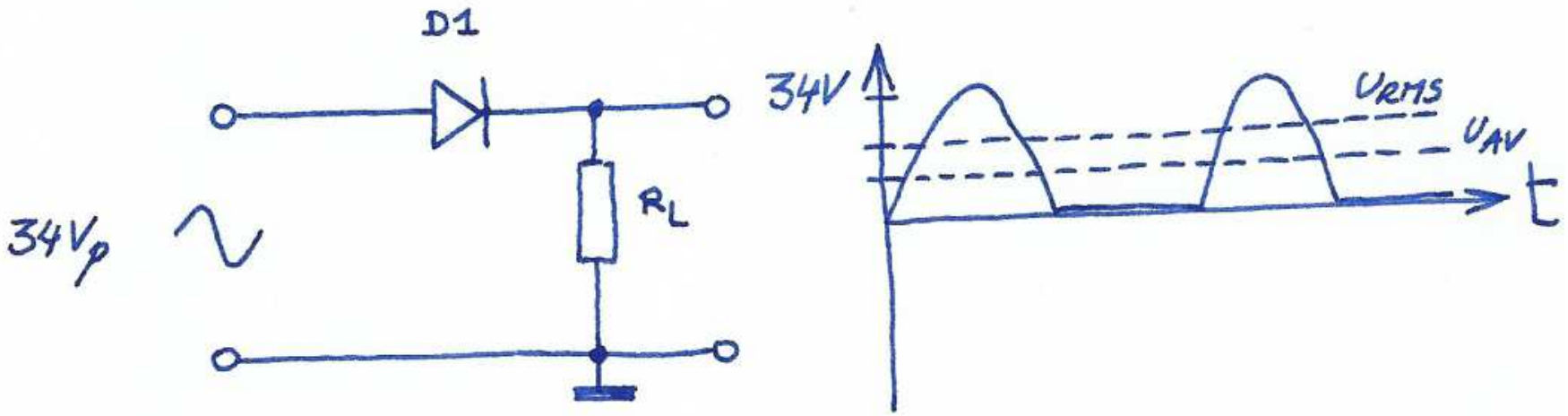


HALVE GOLF GELIJKGERICHTE SINUS



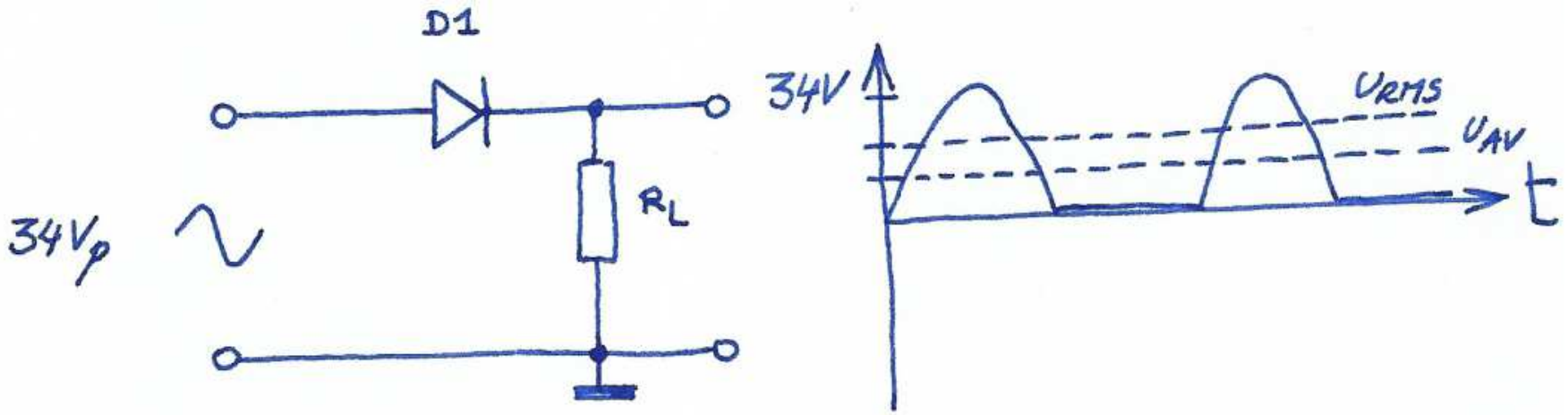
→ we verwaarlozen de doorlaatspanning V_F

HALVE GOLF GELIJKGERICHTE SINUS



→ we verwaarlozen de doorlaatspanning V_F

→ $\boxed{U_{eff} = \frac{U_p}{2}} = \frac{34V}{2} = 17V$

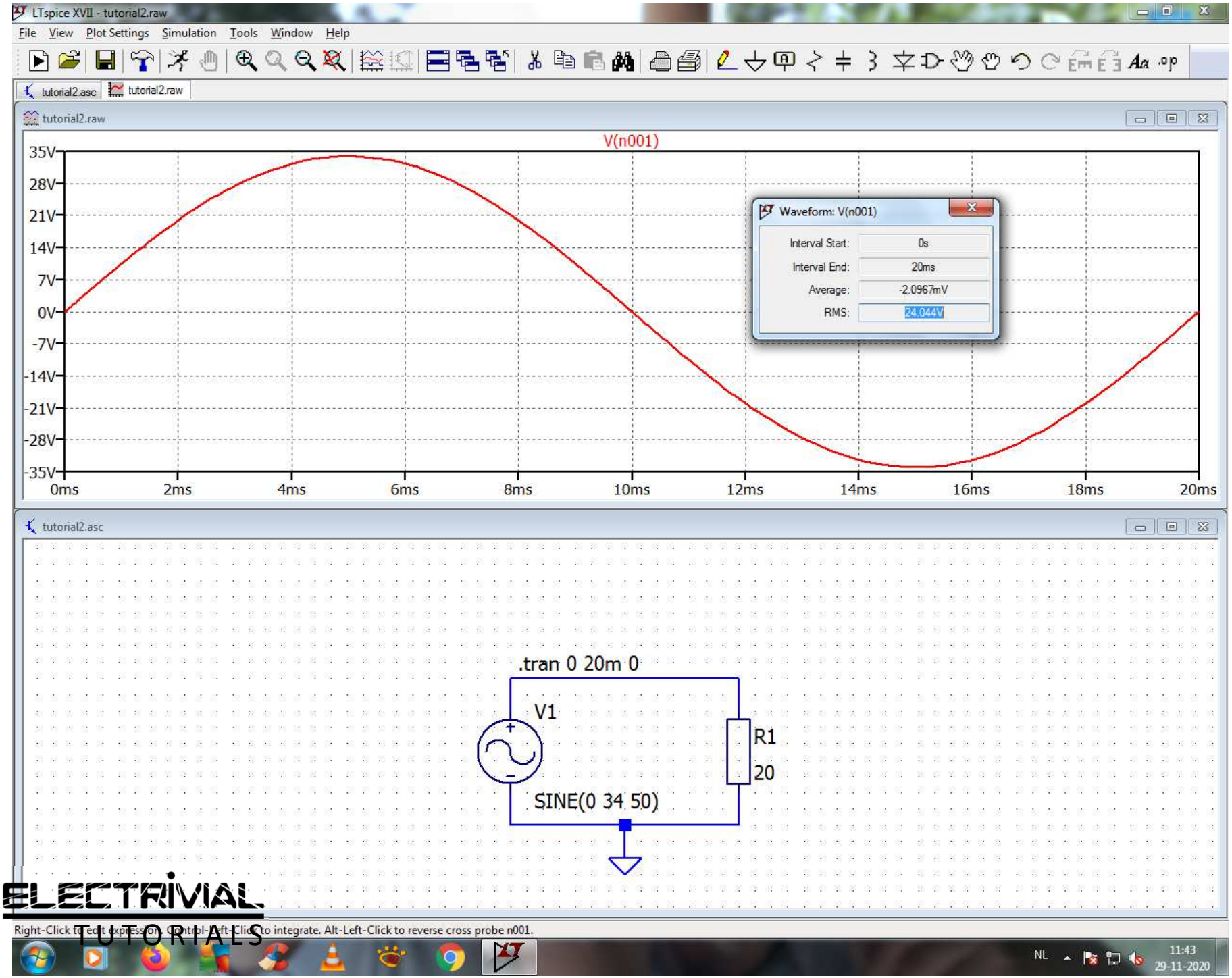


→ we verwaarlozen de doorlaatspanning V_F

$$U_{DC} = \frac{U_p}{\pi} = \frac{34\,V}{\pi} = 10,82\,V$$

→ $U_{eff} \gg U_{DC}$

→ wat zegt onze simulator LTspice ?



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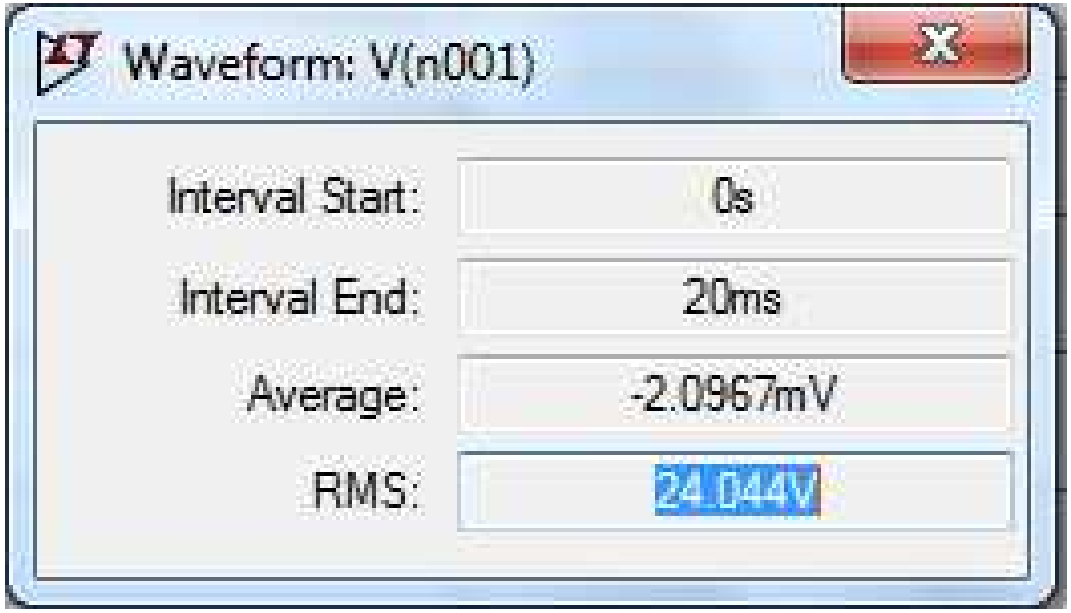
Effectieve waarde sinusspanning



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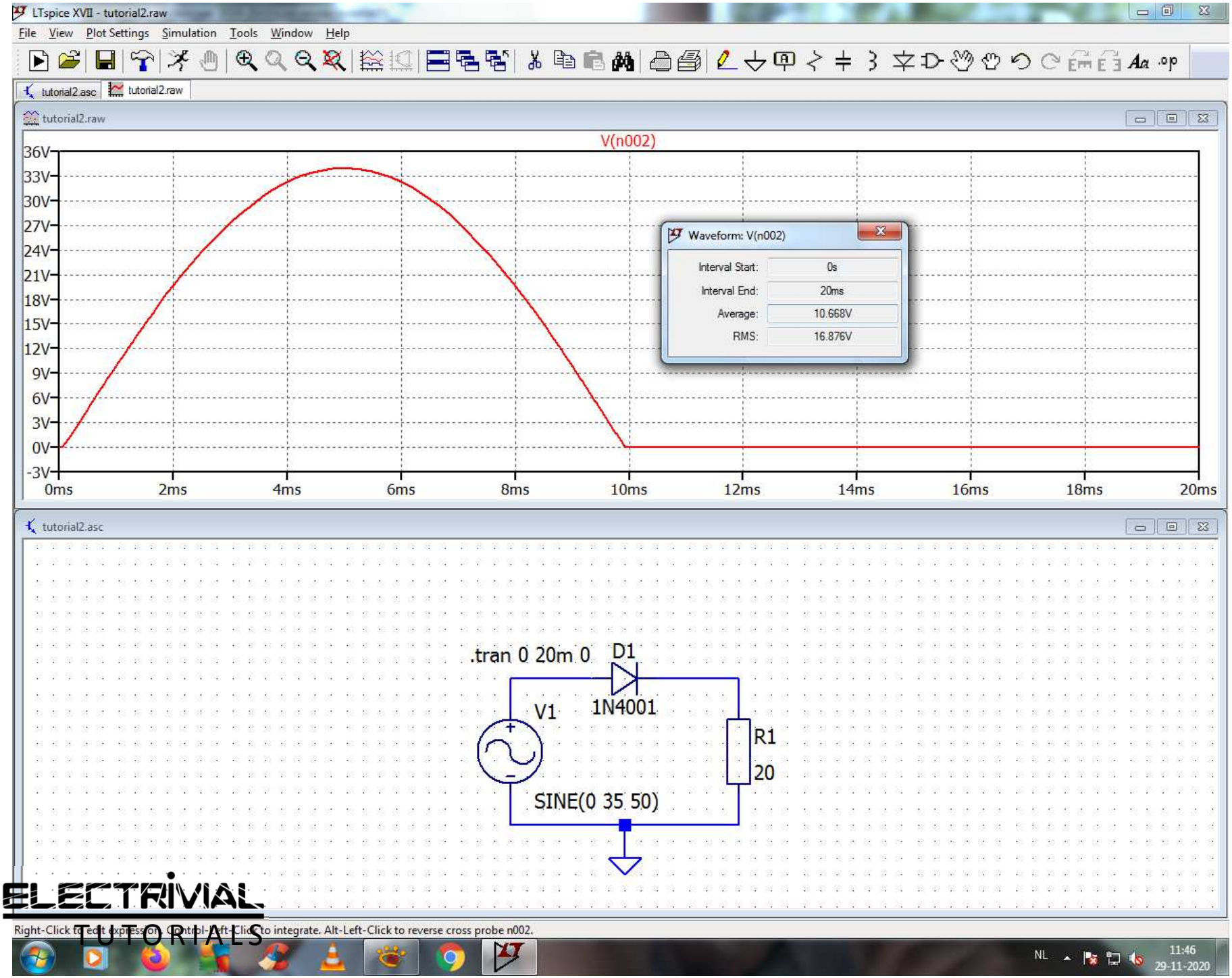

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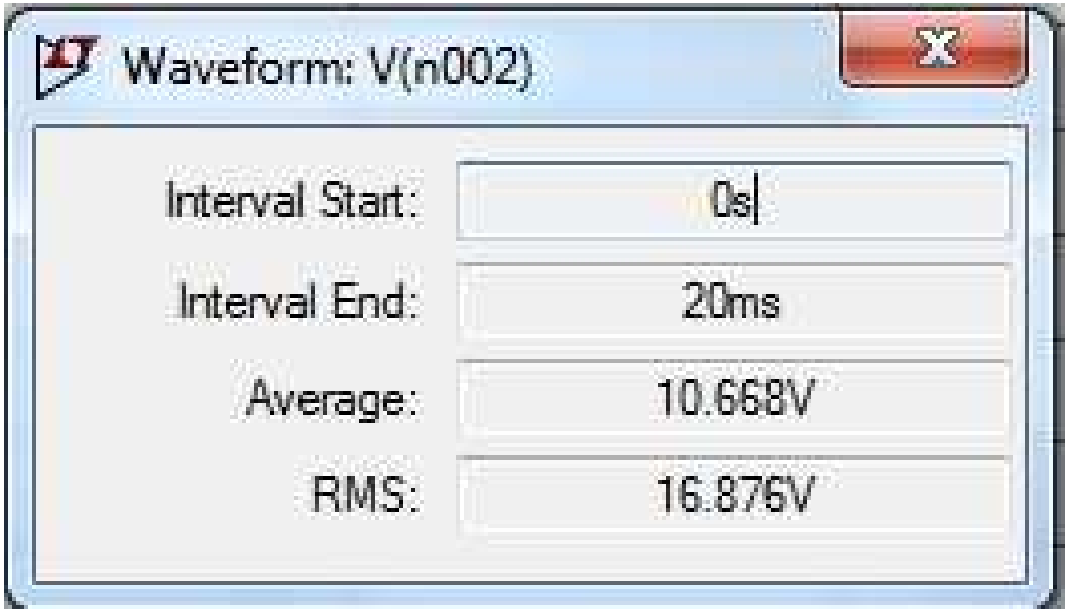
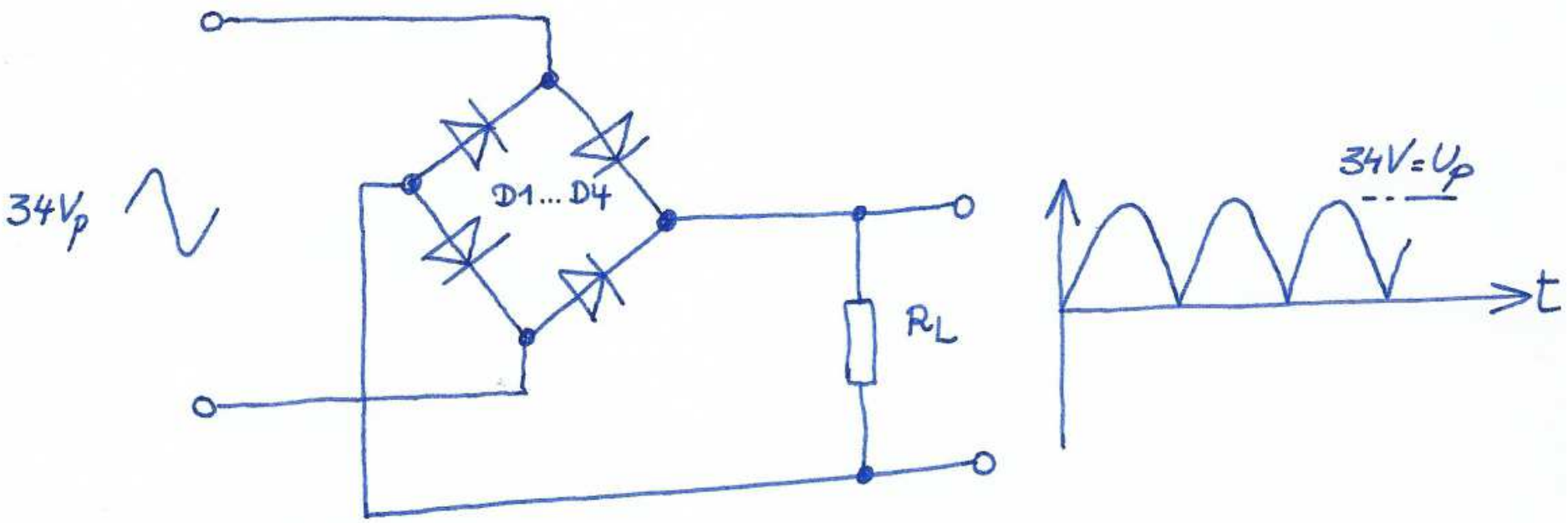
Halve golf gelijkgerichte sinusspanning



VOLLE GOLF GELIJKGERICHTE SINUS



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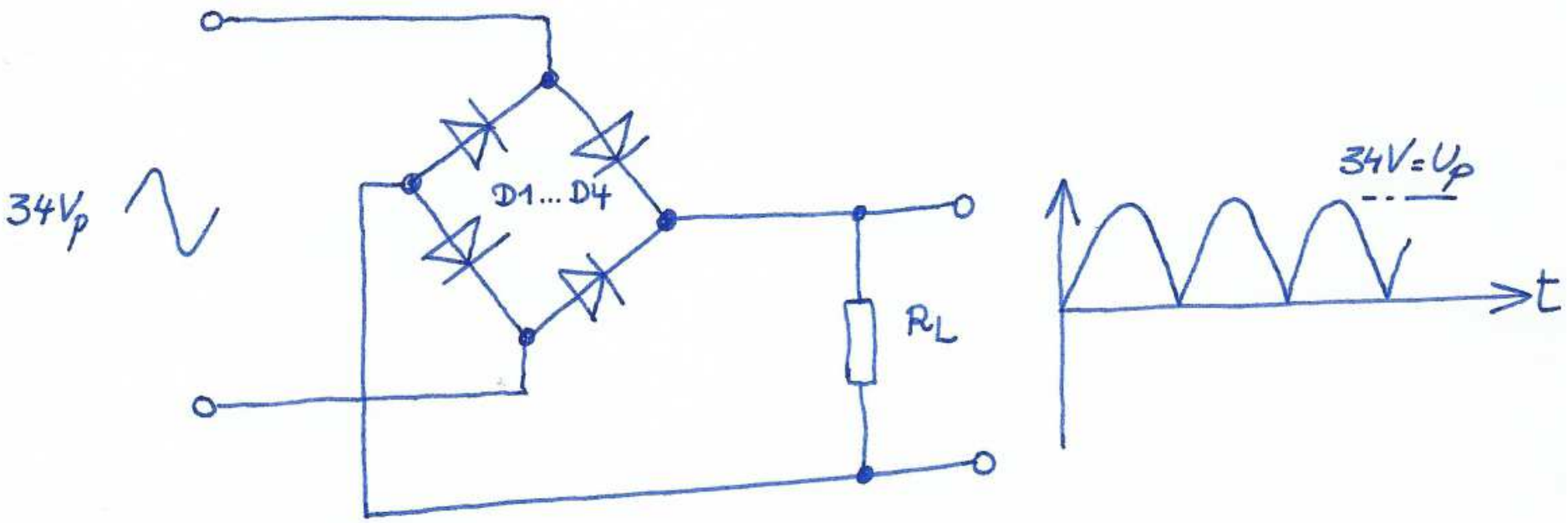
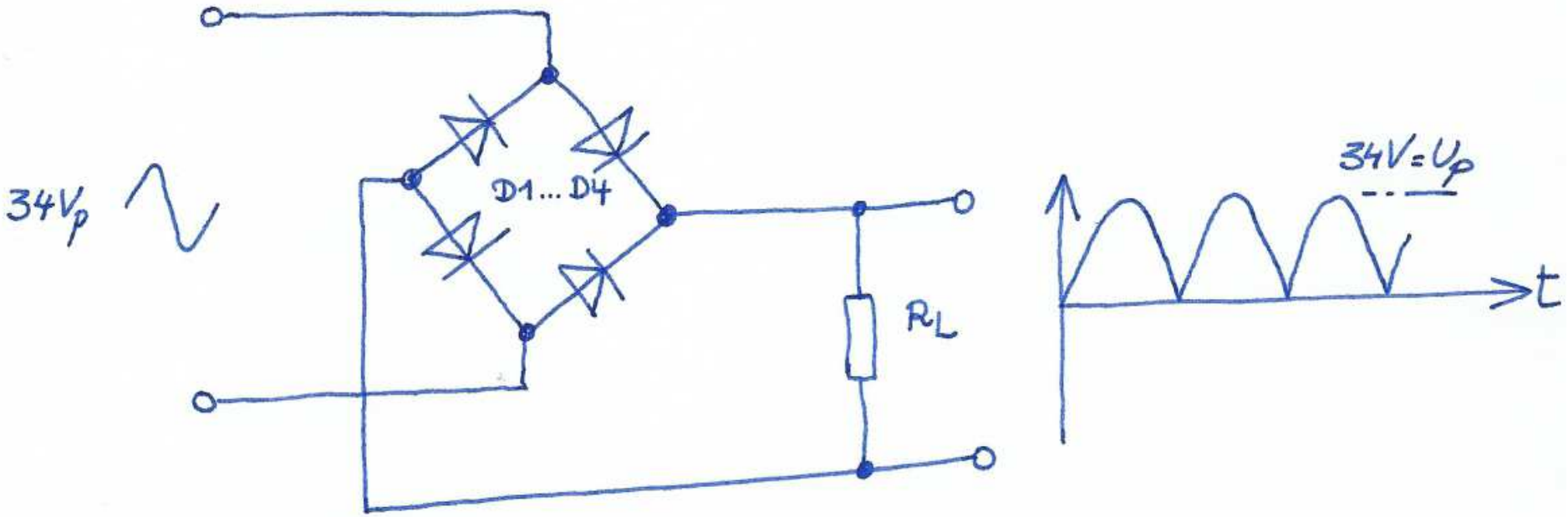
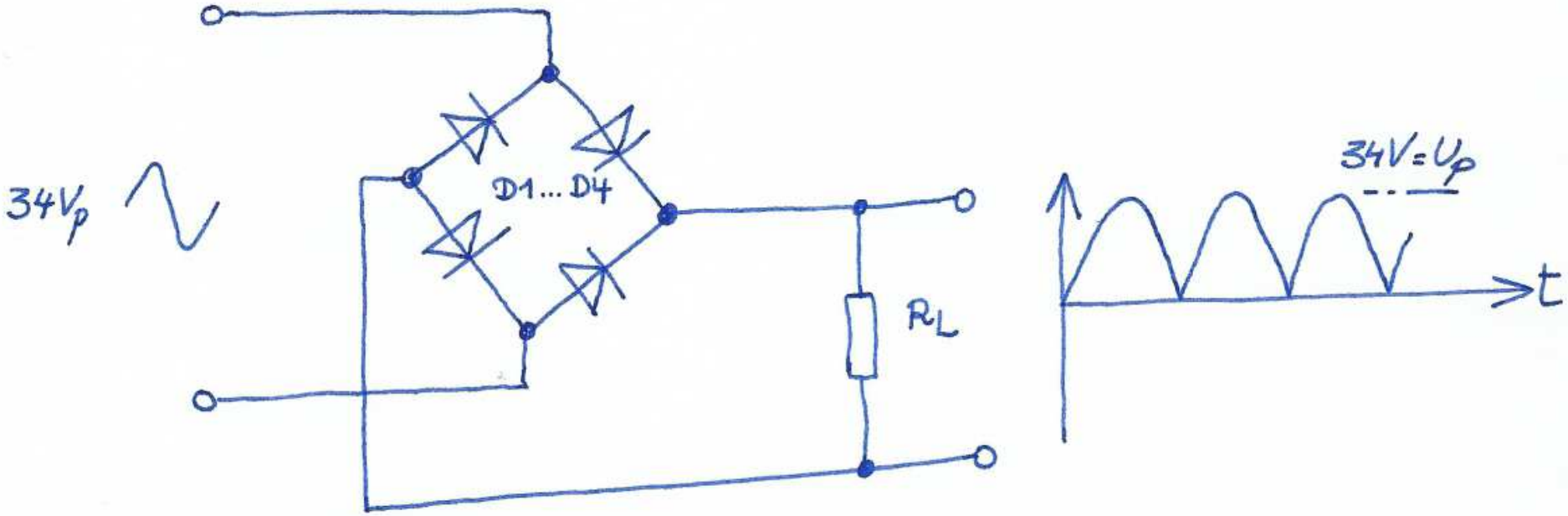


→ We verwaarlozen de doorlaatspanning V_f



→ We verwaarlozen de doorlaatspanning V_f

→ $$\boxed{U_{eff} = \frac{U_p}{\sqrt{2}}} = \frac{34\,V}{\sqrt{2}} = 24\,V$$



→ We verwaarlozen de doorlaatspanning V_f

→ $\boxed{U_{eff} = \frac{U_p}{\sqrt{2}}} = \frac{34\,V}{\sqrt{2}} = 24\,V$

→ $\boxed{U_{DC} = \frac{2 \cdot U_p}{\pi}} = \frac{2 \cdot 34\,V}{\pi} = 21{,}64\,V$

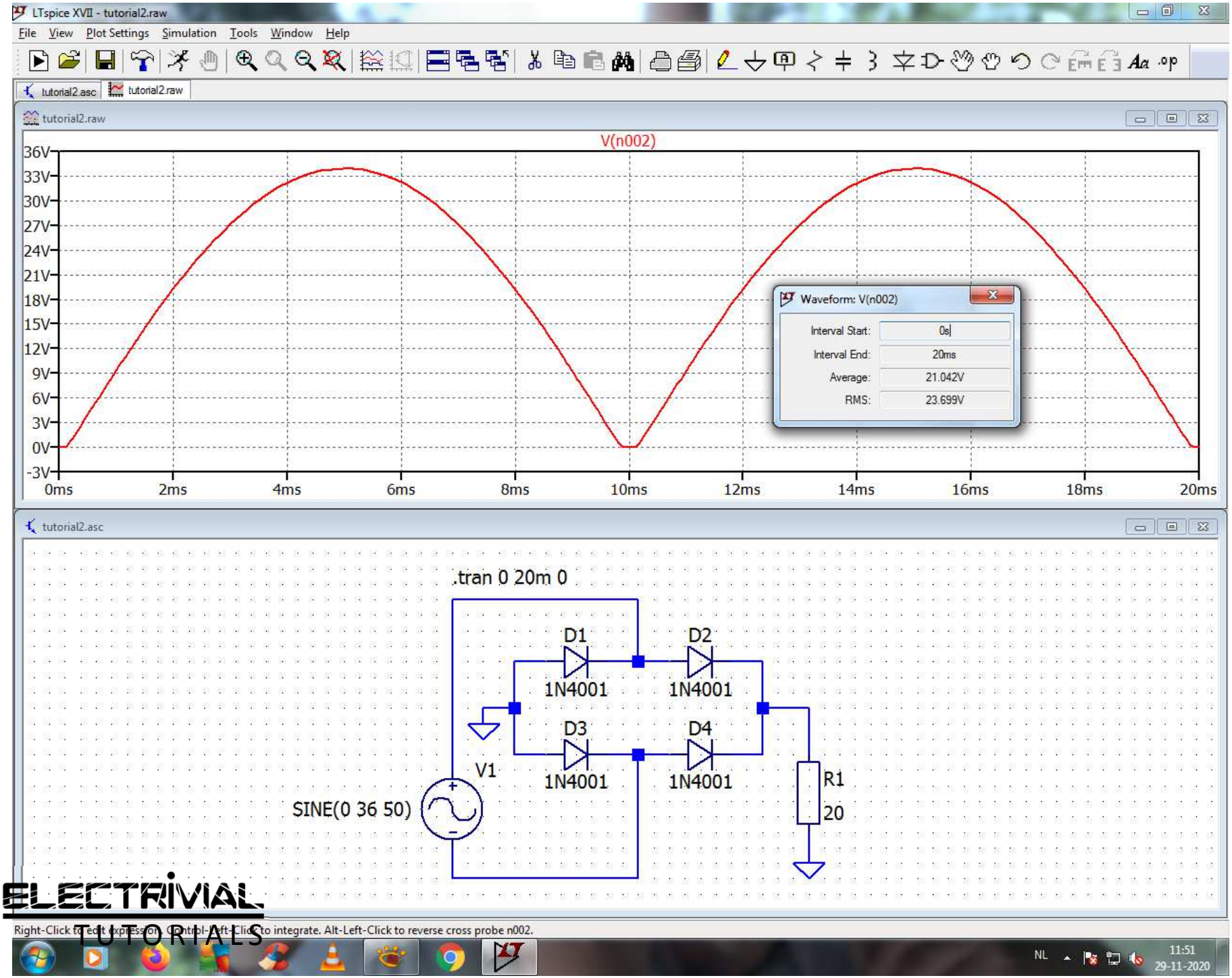
→ We verwaarlozen de doorlaatspanning V_f

→ $\boxed{U_{eff} = \frac{U_p}{\sqrt{2}}} = \frac{34\,V}{\sqrt{2}} = 24\,V$

→ $\boxed{U_{DC} = \frac{2 \cdot U_p}{\pi}} = \frac{2 \cdot 34\,V}{\pi} = 21{,}64\,V$

→ $U_{eff} > U_{DC}$

LET OP ! Altijd effectieve waarden voor berekeningen van VERMOGEN



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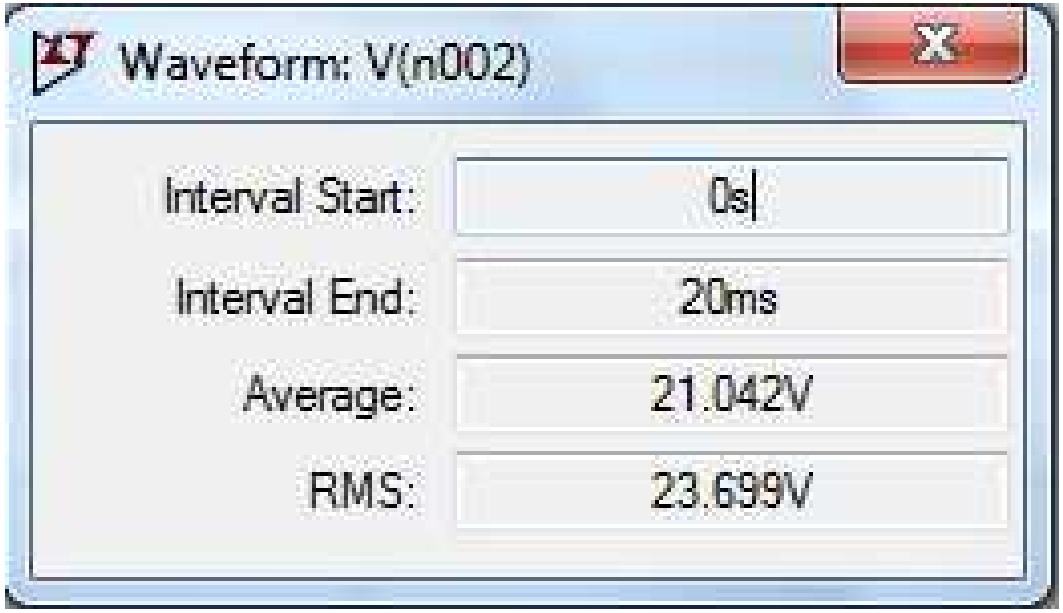
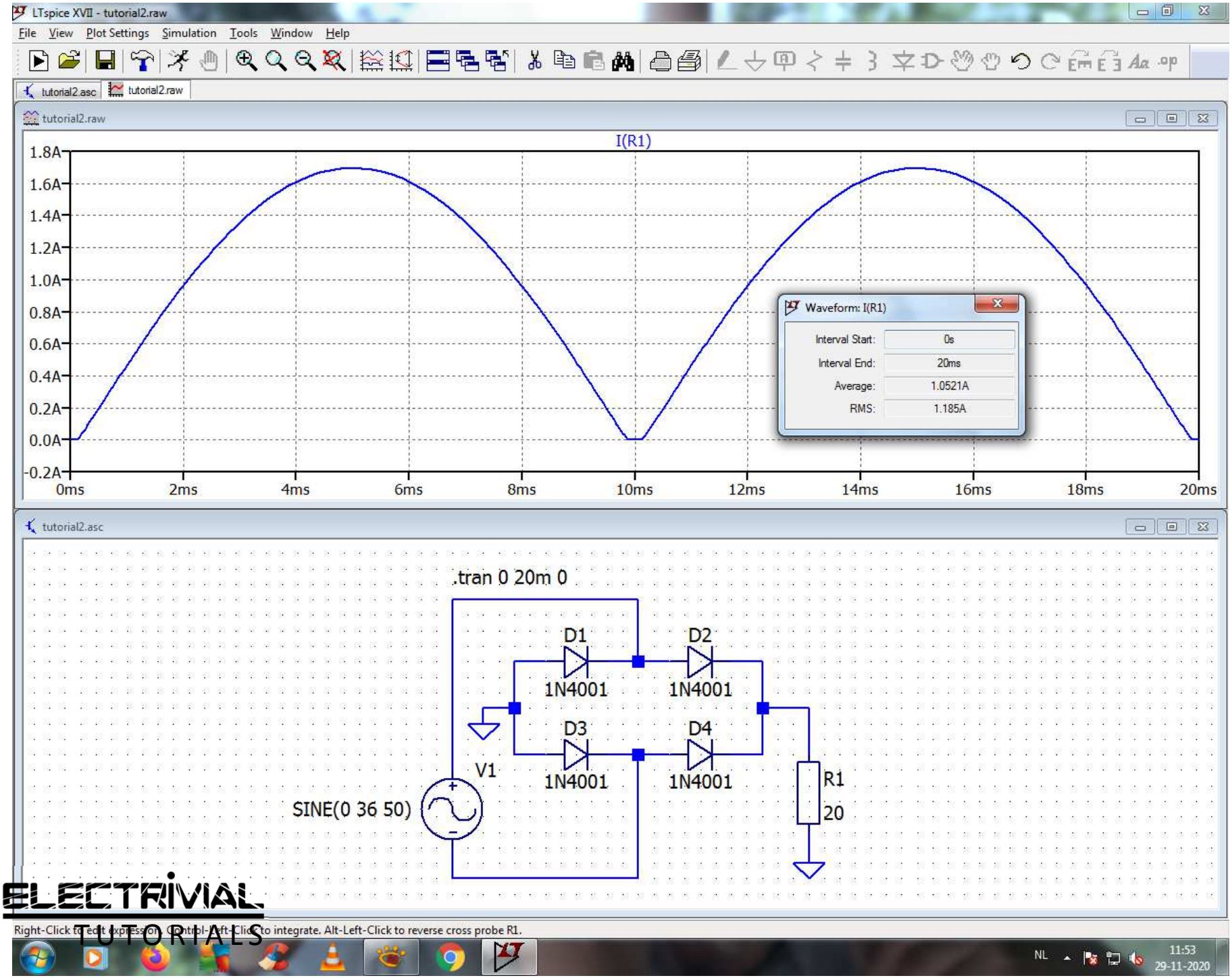
Volle golf gelijkgerichte sinusspanning





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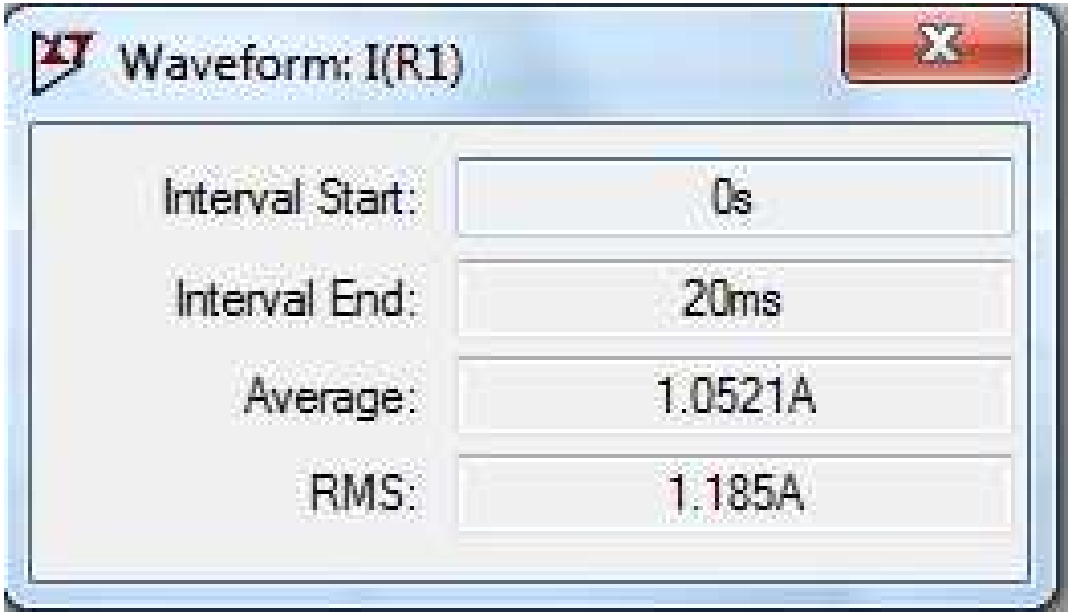
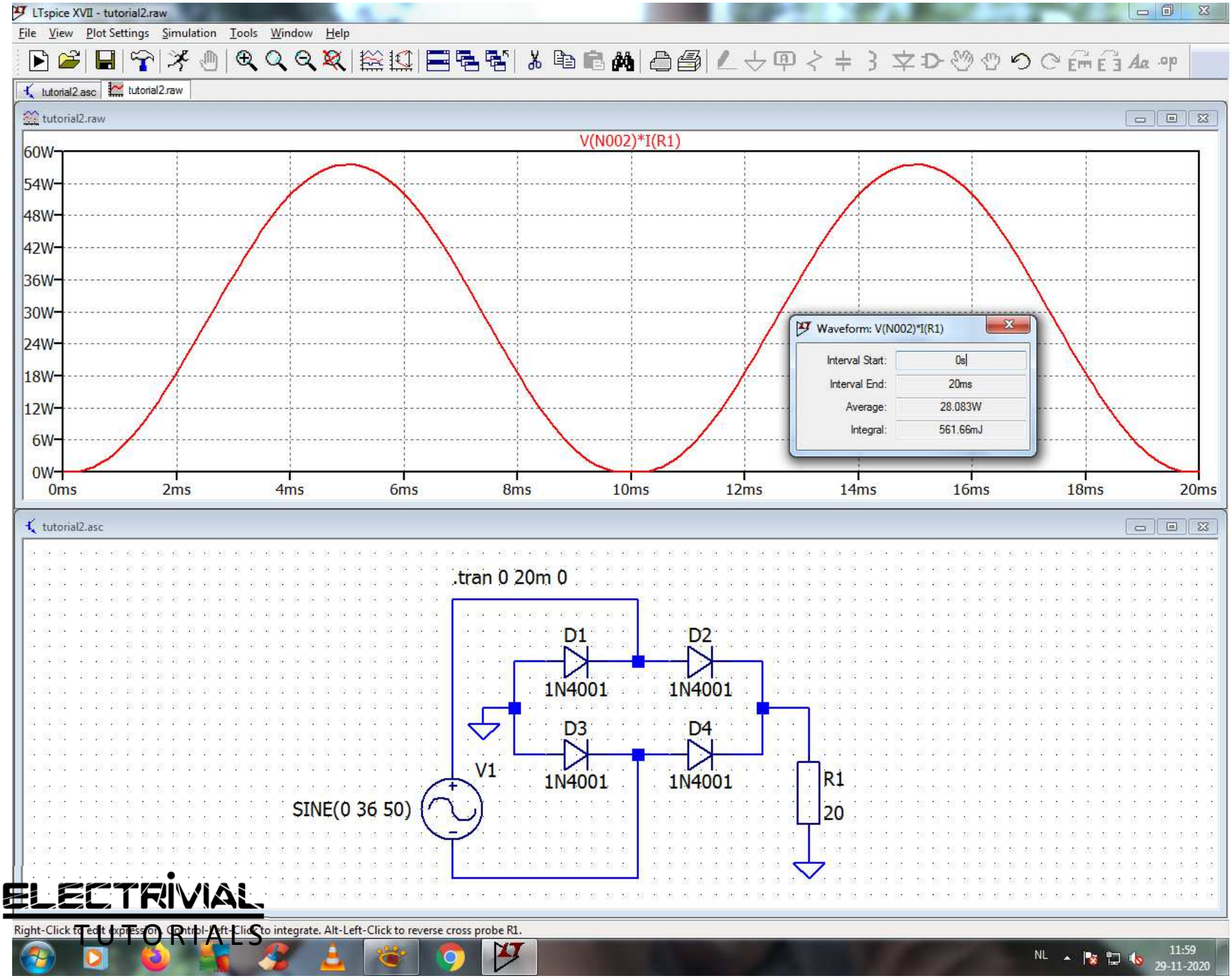
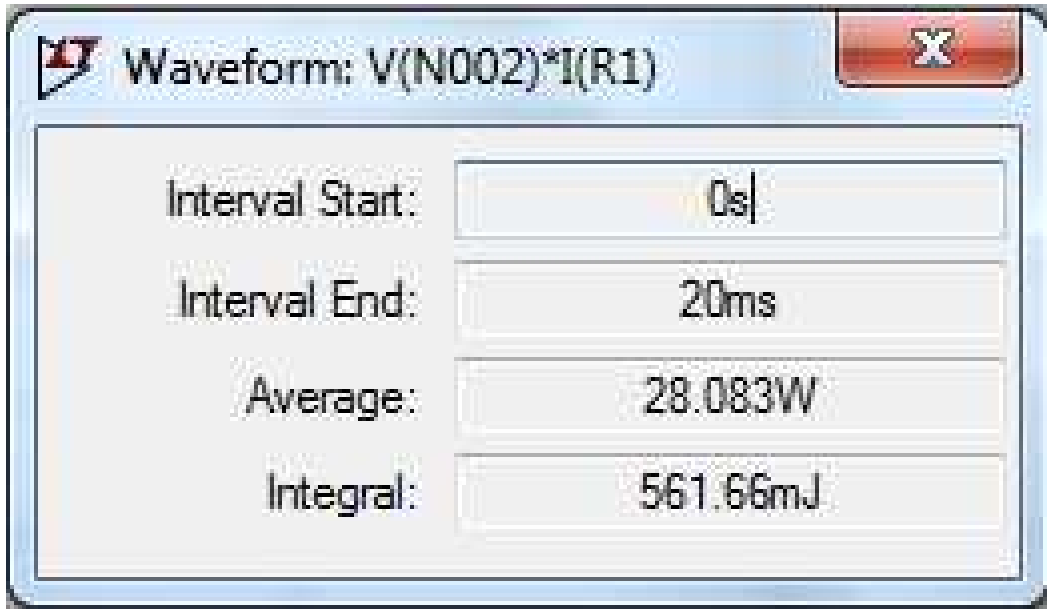
Volle golf gelijkgerichte sinusstroom





Vermogendissipatie in de belasting



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