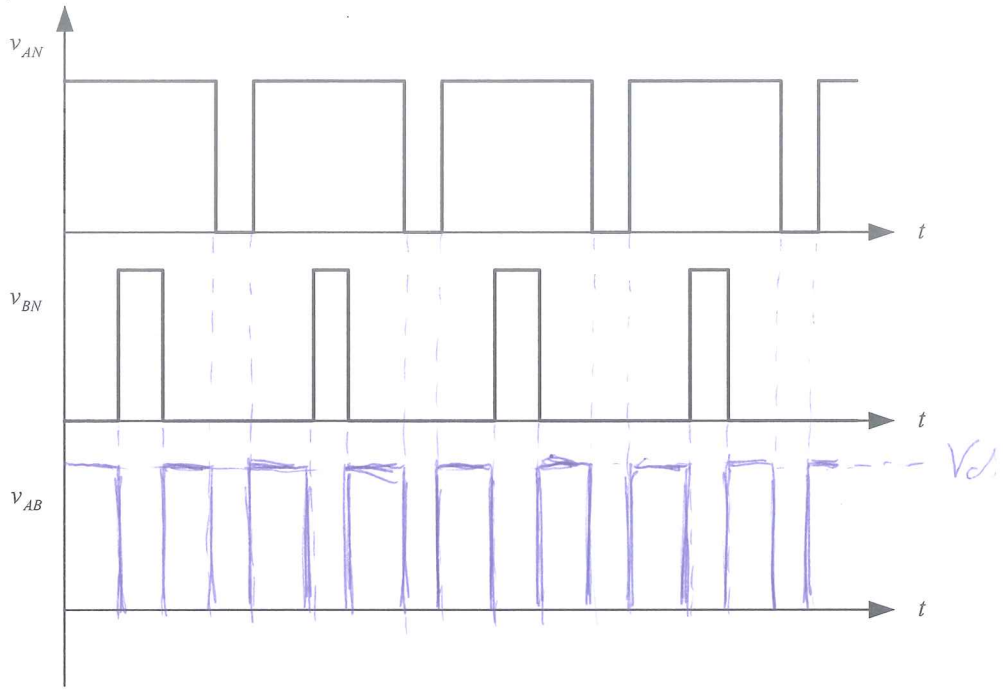
Peer assessment #4 in Power Electronics, *version A*

1. In the figure below two output voltages from a three-phase switch-mode inverter are shown. The voltages are measured between the respective output terminal and the negative pole of the input direct voltage supply. Draw the waveform of v_{AB}.



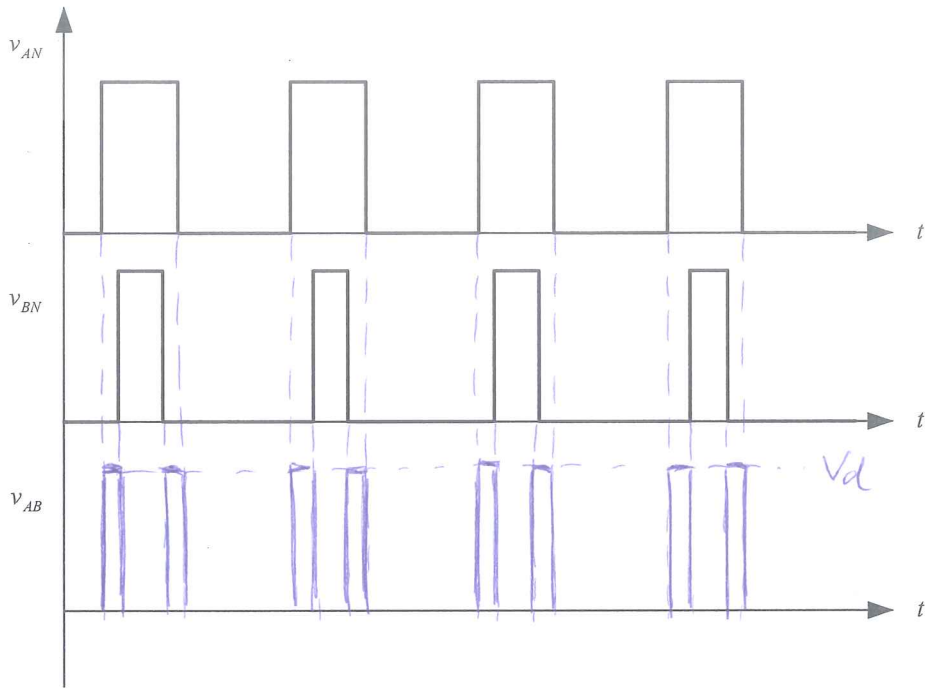
2. Calculate the fundamental component of the line-to-line voltage at the output of the inverter if $V_d = 540$ V, $m_a = 0{,}2$ and $f_s = 11{,}4$ kHz.

$$\hat{V}_{AN(1)} = m_a \cdot \frac{V_d}{2} \Rightarrow V_{AN(1)} = m_a \cdot \frac{V_d}{2\cdot\sqrt{2}}$$

$$V_{AB(1)} = \sqrt{3}\cdot V_{AN(1)} = m_a \cdot \sqrt{\frac{3}{2}} \cdot \frac{V_d}{2} = 0{,}2 \cdot \sqrt{1{,}5} \cdot \frac{540}{2} = \underline{66\ \text{V}}$$

Peer assessment #4 in Power Electronics, *version B*

1. In the figure below two output voltages from a three-phase switch-mode inverter are shown. The voltages are measured between the respective output terminal and the negative pole of the input direct voltage supply. Draw the waveform of v_{AB}.



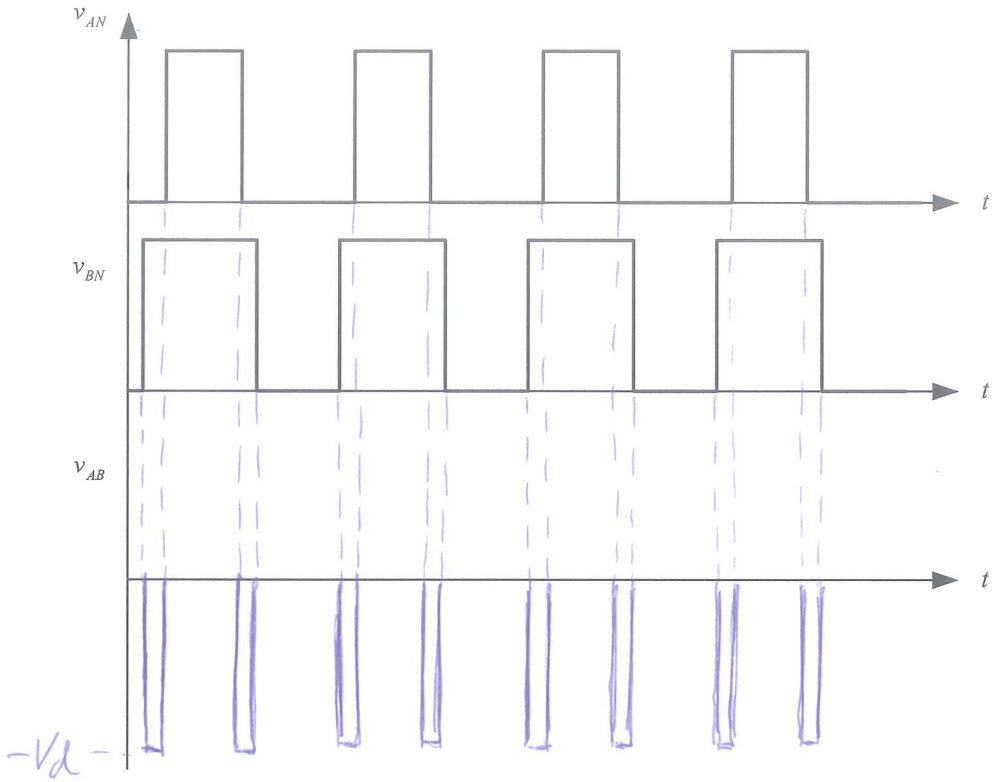
2. Calculate the fundamental component of the line-to-line voltage at the output of the inverter if $V_d = 540$ V, $m_a = 0{,}9$ and $f_s = 4{,}7$ kHz.

$$\hat{V}_{AN(1)} = m_a \cdot \frac{V_d}{2} \Rightarrow V_{AN(1)} = m_a \cdot \frac{V_d}{2 \cdot \sqrt{2}}$$

$$V_{AB(1)} = \sqrt{3} \cdot V_{AN(1)} = m_a \cdot \sqrt{\frac{3}{2}} \cdot \frac{V_d}{2} = 0{,}9 \cdot \sqrt{1{,}5} \cdot \frac{540}{2} = \underline{298\ V}$$

Peer assessment #4 in Power Electronics, *version C*

1. In the figure below two output voltages from a three-phase switch-mode inverter are shown. The voltages are measured between the respective output terminal and the negative pole of the input direct voltage supply. Draw the waveform of v_{AB}.



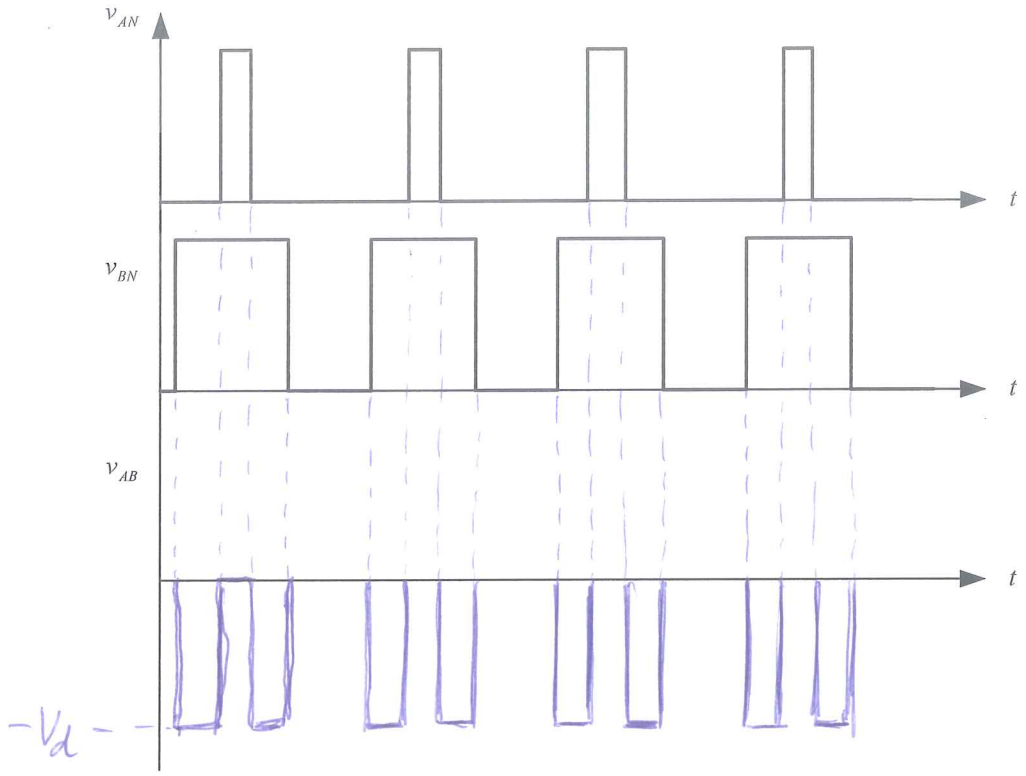
2. Calculate the fundamental component of the line-to-line voltage at the output of the inverter if $V_d = 540$ V, $m_a = 0{,}4$ and $f_s = 6{,}8$ kHz.

$$\hat{V}_{AN(1)} = m_a \cdot \frac{V_d}{2} \Rightarrow V_{AN(1)} = m_a \cdot \frac{V_d}{2\cdot\sqrt{2}}$$

$$V_{AB(1)} = \sqrt{3}\cdot V_{AN(1)} = m_a \cdot \sqrt{\frac{3}{2}} \cdot \frac{V_d}{2} = 0{,}4 \cdot \sqrt{1{,}5} \cdot \frac{540}{2} = 132\ \text{V}$$

Peer assessment #4 in Power Electronics, *version D*

1. In the figure below two output voltages from a three-phase switch-mode inverter are shown. The voltages are measured between the respective output terminal and the negative pole of the input direct voltage supply. Draw the waveform of v_{AB}.



2. Calculate the fundamental component of the line-to-line voltage at the output of the inverter if $V_d = 540$ V, $m_a = 0{,}6$ and $f_s = 8{,}3$ kHz.

$$\hat{V}_{AN(1)} = m_a \cdot \frac{V_d}{2} \Rightarrow V_{AN(1)} = m_a \cdot \frac{V_d}{2\cdot\sqrt{2}}$$

$$V_{AB(1)} = \sqrt{3}\cdot V_{AN(1)} = m_a \cdot \sqrt{\frac{3}{2}} \cdot \frac{V_d}{2} = 0{,}6 \cdot \sqrt{1{,}5} \cdot \frac{540}{2} = 198\ \text{V}$$