$$(a \otimes b) \otimes (c \otimes d)$$

$$\xrightarrow{\alpha_{a \otimes b, c, d}} \qquad \xrightarrow{\alpha_{a, b, c \otimes d}}$$

$$((a \otimes b) \otimes c) \otimes d \qquad (a \otimes (b \otimes (c \otimes d)))$$

$$\alpha_{a,b,c} \otimes \mathrm{id}_d \downarrow \qquad \uparrow \mathrm{id}_a \otimes \alpha_{b,c,d}$$

$$(a \otimes (b \otimes c)) \otimes d \xrightarrow{\alpha_{a, b \otimes c, d}} a \otimes ((b \otimes c) \otimes d)$$