$$\langle x, y \rangle = \sum_{k=0}^{K-1} x[k] \ (y[k])^* = \frac{1}{K} \sum_{n=0}^{K-1} X[n] \ (Y[n])^* = \frac{1}{K} \ \langle X, Y \rangle \ ; \ \begin{cases} \langle x, Y \rangle & = & K \ \left\langle \mathcal{F}^{-1}\{x\}, y \right\rangle \\ \langle X, y \rangle & = & K \ \left\langle x, \mathcal{F}^{-1}\{y\} \right\rangle \end{cases}$$