$$K_{12}^{2} = \begin{bmatrix} \frac{-3\,U}{t} & \frac{\frac{-\mathbf{i}}{2}\left(-3\,\mathbf{i}+\sqrt{3}\right)U^{2}}{\sqrt{2}\,t^{2}} & \frac{3\left(1+\mathbf{i}\,\sqrt{3}\right)U}{2\,\sqrt{2}\,t} \\ \frac{\frac{\mathbf{i}}{2}\left(3\,\mathbf{i}+\sqrt{3}\right)U^{2}}{\sqrt{2}\,t^{2}} & \frac{-3\,U}{2\,t} & \frac{\frac{-\mathbf{i}}{4}\left(-3\,\mathbf{i}+\sqrt{3}\right)U^{2}}{t^{2}} \\ \frac{3\left(1-\mathbf{i}\,\sqrt{3}\right)U}{2\,\sqrt{2}\,t} & \frac{\frac{\mathbf{i}}{4}\left(3\,\mathbf{i}+\sqrt{3}\right)U^{2}}{t^{2}} & \frac{-9\,U}{2\,t} \end{bmatrix}$$