$$
\begin{aligned}
\Psi_{234} &= C_1\left(-|2d2u\rangle + |2u2d\rangle - |d2u2\rangle + |u2d2\rangle\right) \\
&\quad + C_2\left(-|22du\rangle + |22ud\rangle - |2du2\rangle + |2ud2\rangle - |d22u\rangle - |du22\rangle + |u22d\rangle + |ud22\rangle\right) \\
&\quad + C_3\left(|0222\rangle + |2022\rangle + |2202\rangle + |2220\rangle\right)
\end{aligned}
$$

$$
C_1 = \frac{48\ \left(i+\sqrt{3}\right)\ t^2 + \left(i+\sqrt{3}\right)\ U^2 + 4\,i\,U\left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{1}{3}} - \left(-i+\sqrt{3}\right)\ \left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{2}{3}}}{2\left(-48\ \left(i+\sqrt{3}\right)\ t^2 + \left(-U + \left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{1}{3}}\right)\ \left(\left(i+\sqrt{3}\right)\ U + \left(-i+\sqrt{3}\right)\ \left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{1}{3}}\right)\right)}
$$

$$
C_2 = \frac{48\,i\ \left(i+\sqrt{3}\right)\ t^2 + i\ \left(i+\sqrt{3}\right)\ U^2 - 4\,U\left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{1}{3}} + \left(-1-i\sqrt{3}\right)\ \left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{2}{3}}}{48\,t\left(-36\,t^2\,U + U^3 + 6\sqrt{6}\sqrt{-\left(t^2\ \left(512\,t^4 + 26\,t^2\,U^2 + U^4\right)\right)}\right)^{\frac{1}{3}}}
$$

$$
C_3 = \frac{1}{2}
$$