$$
\begin{aligned}
\Psi_{196} &= C_1\left(|2ddu\rangle + i\,|ddu2\rangle - |du2d\rangle - i\,|u2dd\rangle\right) \\
&\quad + C_2\left(|2dud\rangle - i\,|d2du\rangle + i\,|dud2\rangle - |ud2d\rangle\right) \\
&\quad + C_3\left(|2udd\rangle - i\,|d2ud\rangle - |dd2u\rangle + i\,|udd2\rangle\right) \\
&\quad + C_4\left(-|0d22\rangle + i\,|20d2\rangle + |220d\rangle - i\,|d220\rangle\right) \\
&\quad + C_5\left(-i\,|022d\rangle + |22d0\rangle + i\,|2d02\rangle - |d022\rangle\right) \\
&\quad + C_6\left(-i\,|02d2\rangle + |2d20\rangle\right) \\
&\quad + C_7\left(|202d\rangle - i\,|d202\rangle\right)
\end{aligned}
$$

$$
C_1 = \frac{\sqrt{2}\,\left(2\,t^2\,\left(-2\,U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)-\sqrt{64\,t^4+3\,t^2\,U^2}\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}{3\,t\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(4\,t+i\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}
$$

$$
C_2 = \frac{3+\frac{2\,\left(-2\,t^2\,\left(-2\,U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)+\sqrt{64\,t^4+3\,t^2\,U^2}\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}{t\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(4\,t+i\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}}{6\,\sqrt{2}}
$$

$$
C_3 = \frac{-3+\frac{2\,\left(-2\,t^2\,\left(-2\,U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)+\sqrt{64\,t^4+3\,t^2\,U^2}\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}{t\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(4\,t+i\,\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}}{6\,\sqrt{2}}
$$

$$
C_4 = \frac{2\,\sqrt{2}\,t\,\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}}{\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(-4\,i\,t+U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)}
$$

$$
C_5 = -\left(\frac{\sqrt{2}\,\left(8\,t^2+i\,t\,U+\sqrt{64\,t^4+3\,t^2\,U^2}\right)}{\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(-4\,i\,t+U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)}\right)
$$

$$
C_6 = \frac{i\,\sqrt{2}\,\left(8\,t^2+\sqrt{64\,t^4+3\,t^2\,U^2}+i\,t\,\left(U+2\,\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}{\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(-4\,i\,t+U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)}
$$

$$
C_7 = \frac{\sqrt{2}\,\left(-8\,i\,t^2-i\,\sqrt{64\,t^4+3\,t^2\,U^2}+t\,\left(U+2\,\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\right)}{\left(U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)\,\left(-4\,i\,t+U+\sqrt{32\,t^2+U^2+4\,\sqrt{64\,t^4+3\,t^2\,U^2}}\right)}
$$