$$
\begin{aligned}
\Psi_{20} &= C_1\left(-i\left|0002\right\rangle - \left|0020\right\rangle + i\left|0200\right\rangle + \left|2000\right\rangle\right) \\
&\quad + C_2\left(\left|00du\right\rangle - \left|00ud\right\rangle - i\left|0du0\right\rangle + i\left|0ud0\right\rangle + i\left|d00u\right\rangle - \left|du00\right\rangle - i\left|u00d\right\rangle + \left|ud00\right\rangle\right)
\end{aligned}
$$

$$
C_1 = \frac{\left(\frac{1}{4}+\frac{i}{4}\right)\,\left(U-\sqrt{16\,t^2+U^2}\right)}{t\,\sqrt{\frac{16\,t^2+U^2-U\,\sqrt{16\,t^2+U^2}}{t^2}}}
$$

$$
C_2 = \frac{1}{\sqrt{\frac{16\,t^2+U^2-U\,\sqrt{16\,t^2+U^2}}{t^2}}}
$$