$$
\begin{aligned}
\Psi_{237} &= C_1 \left(|22du\rangle + |22ud\rangle + i\,|2du2\rangle + i\,|2ud2\rangle + i\,|d22u\rangle - |du22\rangle + i\,|u22d\rangle - |ud22\rangle \right) \\
&\quad + C_2 \left(|2d2u\rangle + |2u2d\rangle + i\,|d2u2\rangle + i\,|u2d2\rangle \right)
\end{aligned}
$$

$$
C_1 = \frac{\frac{1}{4} - \frac{i}{4}}{\sqrt{2}}
$$

$$
C_2 = \frac{\frac{i}{2}}{\sqrt{2}}
$$