From Wikipedia ("Rabi cycle"), for the static Hamiltonian:

$$\mathcal{H}_0 = \frac{1}{2}\omega_0\sigma_z \tag{1}$$

The driving term:

$$\mathcal{H}_1 = \frac{1}{2}\Omega\left(\sigma_x \cos\left(\omega t\right) - \sigma_y \sin\left(\omega t\right)\right) \tag{2}$$

For this driving term, we get population oscillations at a frequency of Ω. First, when we replace the circular driving to a linear one, we need to compensate with a factor of 2, so to get a Rabi frequency of Ω the term should be:

$$\mathcal{H}_1 = \Omega\sigma_x \cos\left(\omega t\right) \tag{3}$$

Next, replace the driving along the xy-plane to a driving vector at an angle of α to the z-axis. So - $\vec{\sigma} \cdot \hat{n} = \sigma_x \sin\left(\alpha\right) + \sigma_z \cos\left(\alpha\right)$. To compensate, we divide by a factor of $\sin\alpha$. Then:

$$\mathcal{H}_1 = \Omega\frac{1}{\sin\alpha}\cos\left(\omega t\right)\left(\sigma_x \sin\alpha + \sigma_z \cos\alpha\right) = \tag{4}$$

$$= \Omega\cos\left(\omega t\right)\left(\sigma_x + \cot\alpha\sigma_z\right) \tag{5}$$

Lastly, we replace the driving waveform with a general waveform $\left|\epsilon\left(t\right)\right| \leq 1$, and we get:

$$\mathcal{H}_1 = \Omega\epsilon\left(t\right)\left(\sigma_x + \cot\alpha\sigma_z\right) \tag{6}$$

For our specific case, $\cos\alpha = \frac{1}{\sqrt{3}} \rightarrow \cot\alpha = \frac{1}{\sqrt{2}}$, so:

$$\mathcal{H}_1 = \Omega\epsilon\left(t\right)\left(\sigma_x + \frac{1}{\sqrt{2}}\sigma_z\right) \tag{7}$$