

$$U^T = \frac{1}{2} \begin{bmatrix} \frac{2}{\sqrt{2}} \cos(\frac{\pi}{16}) & \cos(\frac{2\pi}{16}) & \cos(\frac{3\pi}{16}) & \cos(\frac{4\pi}{16}) & \cos(\frac{5\pi}{16}) & \cos(\frac{6\pi}{16}) & \cos(\frac{7\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{3\pi}{16}) & \cos(\frac{6\pi}{16}) & \cos(\frac{9\pi}{16}) & \cos(\frac{12\pi}{16}) & \cos(\frac{15\pi}{16}) & \cos(\frac{18\pi}{16}) & \cos(\frac{21\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{5\pi}{16}) & \cos(\frac{10\pi}{16}) & \cos(\frac{15\pi}{16}) & \cos(\frac{20\pi}{16}) & \cos(\frac{25\pi}{16}) & \cos(\frac{30\pi}{16}) & \cos(\frac{35\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{7\pi}{16}) & \cos(\frac{14\pi}{16}) & \cos(\frac{21\pi}{16}) & \cos(\frac{28\pi}{16}) & \cos(\frac{35\pi}{16}) & \cos(\frac{42\pi}{16}) & \cos(\frac{49\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{9\pi}{16}) & \cos(\frac{18\pi}{16}) & \cos(\frac{27\pi}{16}) & \cos(\frac{36\pi}{16}) & \cos(\frac{45\pi}{16}) & \cos(\frac{54\pi}{16}) & \cos(\frac{63\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{11\pi}{16}) & \cos(\frac{22\pi}{16}) & \cos(\frac{33\pi}{16}) & \cos(\frac{44\pi}{16}) & \cos(\frac{55\pi}{16}) & \cos(\frac{66\pi}{16}) & \cos(\frac{77\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{13\pi}{16}) & \cos(\frac{26\pi}{16}) & \cos(\frac{39\pi}{16}) & \cos(\frac{52\pi}{16}) & \cos(\frac{65\pi}{16}) & \cos(\frac{78\pi}{16}) & \cos(\frac{91\pi}{16}) \\ \frac{2}{\sqrt{2}} \cos(\frac{15\pi}{16}) & \cos(\frac{30\pi}{16}) & \cos(\frac{45\pi}{16}) & \cos(\frac{60\pi}{16}) & \cos(\frac{75\pi}{16}) & \cos(\frac{90\pi}{16}) & \cos(\frac{105\pi}{16}) \end{bmatrix} \quad (1)$$