$$\begin{cases} \text{cocycle } {}^z\underset{\sim}{g} \in K^{\mathbb{C}}\text{:} \quad {}^z\underset{\sim}{\underset{\sim}{gy}} = {}^z\underset{\sim}{g}{}^{zg}\underset{\sim}{y} \\ {}^{zg}R_{wg} = {}^w\underset{\sim}{g}^*\,{}^zR_w\,{}^z\underset{\sim}{g} \end{cases} \quad \Longrightarrow \text{ cocycle } {}^z\underset{\sim}{\underset{\sqcup}{g}} = \underbrace{{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2}}_{\text{unit part}} \in K$$

$$\underset{\sqcup}{A} = \overbrace{A\overset{*}{A}}^{-\,1/2}\,A$$

$${}^z\underset{\sim}{\underset{\sqcup}{g}} = \underbrace{{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2}} = \overbrace{{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2\,z}R_z^{-\,1/2}\,{}^z\underset{\sim}{g}^*}^{-\,1/2}\,{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2} = \overbrace{{}^z\underset{\sim}{g}\,{}^zR_z^{-1}\,{}^z\underset{\sim}{g}^*}^{-\,1/2}\,{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2}$$

$${}^z\underset{\sim}{\underset{\sqcup}{\underset{\sim}{gy}}} = \underbrace{{}^z\underset{\sim}{\underset{\sim}{gy}}\,{}^zR_z^{-\,1/2}} = \overbrace{{}^z\underset{\sim}{\underset{\sim}{gy}}\,{}^zR_z^{-1}\,{}^z\underset{\sim}{\underset{\sim}{gy}}}^{-\,1/2}\,{}^z\underset{\sim}{\underset{\sim}{gy}}\,{}^zR_z^{-\,1/2} = \overbrace{{}^z\underset{\sim}{g}\,{}^{zg}\underset{\sim}{y}\,{}^zR_z^{-1\,zg}\underset{\sim}{y}^*\,{}^z\underset{\sim}{g}^*}^{-\,1/2}\,{}^z\underset{\sim}{g}\,{}^{zg}\underset{\sim}{y}\,{}^zR_z^{-\,1/2}$$

$${}^z\underset{\sim}{\underset{\sqcup}{g}}\,{}^{zg}\underset{\sim}{\underset{\sqcup}{y}} = \overbrace{{}^z\underset{\sim}{g}\,{}^zR_z^{-1}\,{}^z\underset{\sim}{g}^*}^{-\,1/2}\,{}^z\underset{\sim}{g}\,{}^zR_z^{-\,1/2}\,\overbrace{{}^{zg}\underset{\sim}{y}\,{}^zR_z^{-1\,zg}\underset{\sim}{y}^*}^{-\,1/2}\,{}^{zg}\underset{\sim}{y}\,{}^zR_z^{-\,1/2}$$