$$
\begin{aligned}
C_{H^2} \to\ & -m_H^2 + \hbar\ \Big(-\tfrac{1}{2}\ \textstyle\sum_p c_{2\gamma}\, g_1{}^2\, LF_{1,0}\big[m_{\tilde{d}}{}^p\big] + 3\, c_\gamma{}^2\, \overline{y_d}{}^{pr}\, y_d{}^{pr}\, LF_{1,0}\big[m_{\tilde{d}}{}^r\big] - \tfrac{1}{2}\ \textstyle\sum_p c_{2\gamma}\, g_1{}^2\, LF_{1,0}\big[m_{\tilde{e}}{}^p\big] + \\
& c_\gamma{}^2\, \overline{y_e}{}^{pr}\, y_e{}^{pr}\, LF_{1,0}\big[m_{\tilde{e}}{}^r\big] + \Big(c_\gamma{}^2\, \overline{y_e}{}^{pr}\, y_e{}^{pr} + \tfrac{1}{2}\ \textstyle\sum_p c_{2\gamma}\, g_1{}^2\Big)\ LF_{1,0}\big[m_{\tilde{l}}{}^p\big] + \\
& \Big(3\, c_\gamma{}^2\, \overline{y_d}{}^{pr}\, y_d{}^{pr} + 3\, s_\gamma{}^2\, \overline{y_u}{}^{pr}\, y_u{}^{pr} - \tfrac{1}{2}\ \textstyle\sum_p c_{2\gamma}\, g_1{}^2\Big)\ LF_{1,0}\big[m_{\tilde{q}}{}^p\big] + \textstyle\sum_p c_{2\gamma}\, g_1{}^2\, LF_{1,0}\big[m_{\tilde{u}}{}^p\big] + \\
& 3\, s_\gamma{}^2\, \overline{y_u}{}^{pr}\, y_u{}^{pr}\, LF_{1,0}\big[m_{\tilde{u}}{}^r\big] + \tfrac{1}{8}\ \Big(-g_1{}^2\ (1 + 3\, c_{4\gamma}) - 3\, g_2{}^2\ (-1 + c_{4\gamma})\Big)\ LF_{1,0}[m_\oplus] - \\
& g_1{}^2\, LF_{1,1,-1}[m_1,\, \tilde{\mu}] - 2\, m_1\, s_\gamma\, \tilde{\mu}\, c_\gamma\, g_1{}^2\, LF_{1,1,0}[m_1,\, \tilde{\mu}] - 3\, g_2{}^2\, LF_{1,1,-1}[m_2,\, \tilde{\mu}] - \\
& 6\, m_2\, s_\gamma\, \tilde{\mu}\, c_\gamma\, g_2{}^2\, LF_{1,1,0}[m_2,\, \tilde{\mu}] + 3\ \Big(c_\gamma\, \overline{a_d}{}^{pr} - s_\gamma\, \tilde{\mu}\, \overline{y_d}{}^{pr}\Big)\ \Big(c_\gamma\, a_d{}^{pr} - s_\gamma\, \tilde{\mu}\, y_d{}^{pr}\Big)\ LF_{1,1,0}\big[m_{\tilde{d}}{}^r,\, m_{\tilde{q}}{}^p\big] + \\
& \Big(c_\gamma\, \overline{a_e}{}^{pr} - s_\gamma\, \tilde{\mu}\, \overline{y_e}{}^{pr}\Big)\ \Big(c_\gamma\, a_e{}^{pr} - s_\gamma\, \tilde{\mu}\, y_e{}^{pr}\Big)\ LF_{1,1,0}\big[m_{\tilde{e}}{}^r,\, m_{\tilde{l}}{}^p\big] + \\
& 3\ \Big(s_\gamma\, \overline{a_u}{}^{pr} - \tilde{\mu}\, c_\gamma\, \overline{y_u}{}^{pr}\Big)\ \Big(s_\gamma\, a_u{}^{pr} - \tilde{\mu}\, c_\gamma\, y_u{}^{pr}\Big)\ LF_{1,1,0}\big[m_{\tilde{q}}{}^p,\, m_{\tilde{u}}{}^r\big]\Big)
\end{aligned}
$$