$$(i,j)^{th}\ \text{cell} = \frac{\beta^{-1}}{i!\,j!}\,\frac{d^{\,i+j}}{dt_1^{\,i}\,dt_2^{\,j}}\Bigg|_{t=\phi} \ln\left\langle e^{t_1\beta H_1 + t_2\beta H_2}\right\rangle$$