$$\left|\tilde{\psi}(x,t)\right|^2 = \frac{N_0}{\tilde{\sigma}_t}\Bigg[\left(e^{-(x-d)^2/4\tilde{\sigma}_t^2} + e^{-(x+d)^2/4\tilde{\sigma}_t^2}\right)^2$$

$$-4e^{-\left(x^2+d^2\right)/2\tilde{\sigma}_t^2}\sin^2\left(\frac{\tilde{\hbar}txd}{4m\sigma^2\tilde{\sigma}_t^2}\right)\Bigg],$$