In the real Sobolev space $H0^1$ (Ω) we consider the Cauchy-Dirichlet problem for sine-Gordon type equation with strongly elliptic operators and two small parameters. Using some a priori estimates of solutions to the perturbed problem and a relationship between solutions in the linear case, we establish convergence estimates for the difference of solutions to the perturbed and corresponding unperturbed problems. We obtain that the solution to the perturbed problem has a singular behavior, relative to the parameters, in the neighbourhood of $t = 0$.