Let noise pulses of charge Q at time t_j be

$s_j(t) = Q\delta(t - t_j)$ .... Q is both positive and negative

N elementary noise pulses within period T. Pulses go through a filter that produces a square voltage pulse of unit area and with t_0. The gain is defined by G.

$$f(t) = \frac{1}{t_0}(u(t) - u(t - t_0)) \xrightarrow{L} F(s) = \frac{1}{s \cdot t_0}(1 - e^{-st_0})$$

$$L[G \cdot s_j(t) \otimes f(t)] = GS_j(s) \cdot F(s) = Q \cdot G \frac{1}{s \cdot t_0}(1 - e^{-st_0}) \cdot e^{-st_j}$$

In our simple example the output pulse will be

$$f_o(t) = \frac{QG}{t_0}(u(t - t_j) - u(t - t_0 - t_j))$$

The gain G can be any constant. In the evaluation of signal/noise it should drop out unless there is noise that originates elsewhere.