If the pulse goes through a filter

$$f_{out}(t) = L^{-1}[F(s) \times T(s)]$$

$$\int_{0-}^{\infty} f_{out}(t)dt = \lim_{s \to 0} F(s) \cdot T(s)$$

To preserve the integral regardless of pulse width, $T(0)$ must be >0