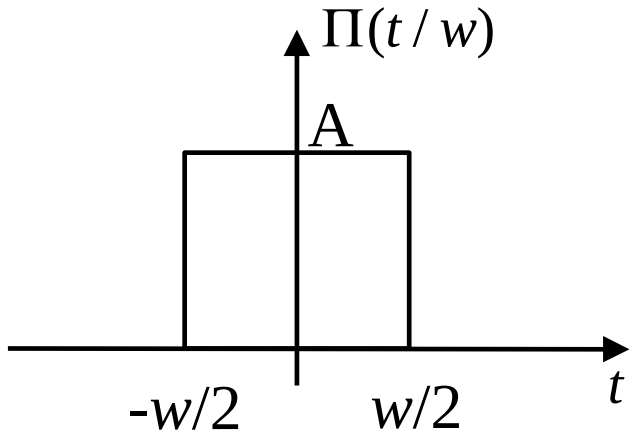
$$\mathrm{F}(f(t)) = \int_{-\infty}^{+\infty} A\Pi(t/w)e^{-j2\pi\mu t}dt = F(\mu)$$



$$= \int_{-w/2}^{w/2} Ae^{-j2\pi\mu t}dt$$

$$= A\int_{-w/2}^{w/2} e^{-j2\pi\mu t}dt = \frac{-A}{j2\pi\mu}\left[e^{-j2\pi\mu t}\right]_{-w/2}^{w/2} = \frac{A}{j2\pi\mu}\left[e^{j\pi\mu w} - e^{-j\pi\mu w}\right]$$

$$= \frac{A}{\pi\mu}\cdot\frac{1}{2j}\left[e^{j\pi\mu w} - e^{-j\pi\mu w}\right] = \frac{A}{\pi\mu}\cdot\sin(\pi\mu w) = Aw\cdot\frac{\sin(\pi\mu w)}{\pi\mu w}$$