

Table of Important Fourier Transforms for Signals and Systems

$f(t) =$	$F(j\omega) =$
$e^{j\omega_0 t}$	$2\pi\delta(\omega - \omega_0)$
1	$2\pi\delta(\omega)$
$\sum_{n=-\infty}^{+\infty} \delta(t - nT)$	$\frac{2\pi}{T} \sum_{k=-\infty}^{+\infty} \delta(\omega - \frac{2\pi k}{T})$
$\begin{cases} 1, t < T_1 \\ 0, t > T_1 \end{cases}$	$\frac{2\sin(\omega T_1)}{\omega}$
$\frac{\sin(Wt)}{\pi t}$	$\begin{cases} 1, \omega < W \\ 0, \omega > W \end{cases}$
$\delta(t)$	1
$u(t)$	$\frac{1}{j\omega} + \pi\delta(\omega)$
$e^{-at}u(t), \text{Re}\{a\} > 0$	$\frac{1}{a + j\omega}$
$te^{-at}u(t), \text{Re}\{a\} > 0$	$\frac{1}{(a + j\omega)^2}$
$\text{rect}(\frac{t}{\tau})$	$\tau \text{sinc}(\frac{\omega\tau}{2})$
$\frac{B}{2\pi} \text{sinc}(\frac{Bt}{2})$	$\text{rect}(\frac{\omega}{B})$
$\text{triangle}(t)$	$\text{sinc}^2(\frac{\omega}{2})$
$A \cos(\frac{\pi t}{2\tau}) \text{rect}(\frac{t}{2\tau})$	$\frac{A\pi}{\tau} \frac{\cos(\omega\tau)}{((\pi/2\tau)^2 - \omega^2)}$
$\sin(\omega_0 t)$	$\frac{\pi}{j} [\delta(\omega - \omega_0) - \delta(\omega + \omega_0)]$
$\cos(\omega_0 t)$	$\pi [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
$\sin(\omega_0 t) u(t)$	$\frac{\pi}{2j} [\delta(\omega - \omega_0) - \delta(\omega + \omega_0)] + \frac{j\omega}{\omega_0^2 - \omega^2}$
$\cos(\omega_0 t) u(t)$	$\frac{\pi}{2} [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)] + \frac{\omega^2}{\omega_0^2 - \omega^2}$
$e^{-\alpha t} \sin(\omega_0 t) u(t)$	$\frac{(\alpha + j\omega)}{\omega_0^2 + (\alpha + j\omega)^2}$
$e^{-\alpha t} \cos(\omega_0 t) u(t)$	$\frac{\omega_0}{\omega_0^2 + (\alpha + j\omega)^2}$
$e^{-\alpha t }$	$\frac{2\alpha}{\alpha^2 + \omega^2}$
$e^{-t^2/2\sigma^2}$	$\sigma\sqrt{2\pi} e^{-\sigma^2\omega^2/2}$