Table of Fourier transforms

CTFT

$$ x(t) \leftrightarrow X(j\omega) $$

$x(t)$ (CT signal)	**$X(j\omega)$ (CTFT)**
$\delta(t)$	1
$\delta(t - t_0)$	$e^{-j\omega t_0}$
1	$2\pi \delta(\omega)$
$e^{j\omega_0 t}$	$2\pi \delta(\omega - \omega_0)$
$e^{-at}u(t), \mathrm{Re}\{a\} > 0$	$\frac{1}{\alpha + j\omega}$
$u(t)$	$\frac{1}{j\omega} + \pi \delta(\omega)$
$\frac{\sin \omega_c t}{\pi t}$	$\left\{ \begin{array}{ll} 1, & -\omega_c < \omega < \omega_c \\ 0, & \mathrm{otherwise} \end{array}\right.$
$\left. \begin{array}{ll} 1, & -M \leq n \leq M \\ 0, & \mathrm{otherwise} \end{array} \right\}$	$\frac{\sin \omega M}{\omega / 2}$

DTFT

$$ x[n] \leftrightarrow X(j\Omega) $$

$x[n]$ (DT signal)	**$X(j\Omega), -\pi \lt \Omega \leq \pi $ (DTFT)**
$\delta[n]$	1
$\delta[n - n_0]$	$e^{-j\Omega n_0}$
1	$2\pi \delta(\Omega)$
$e^{j\Omega_0 n} (-\pi \lt \Omega_0 \leq \pi)$	$2\pi \delta(\Omega - \Omega_0)$
$a^n u[n], \|a\| \lt 1$	$\frac{1}{1 - ae^{-j\Omega}}$
$u[n]$	$\frac{1}{1-e^{-j\Omega}} + \pi\delta(\Omega)$
$\frac{\sin \Omega_c n}{\pi n}$	$\left\{ \begin{array}{ll} 1, & -\Omega_c \lt \Omega \lt \Omega_c \\ 0, & \mathrm{otherwise}\end{array}\right.$
$\left. \begin{array}{ll} 1, & -M \leq n \leq M \\ 0, & \mathrm{otherwise} \end{array} \right\}$	

References

- *Oppenheim, A. and Verghese, G., 2016. Signals, systems and inference. 1st ed.*

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