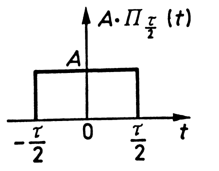
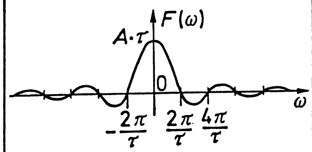
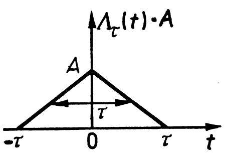
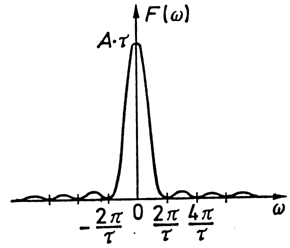
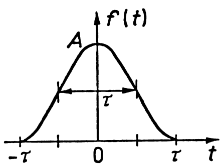
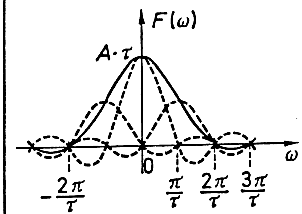
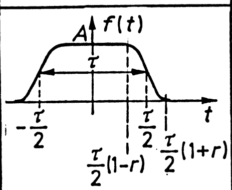
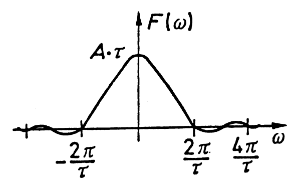
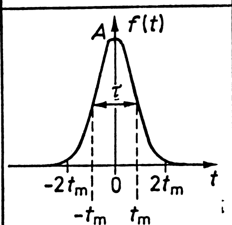
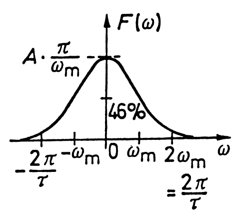
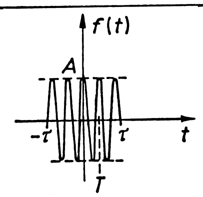
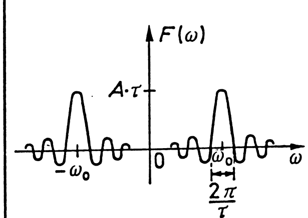
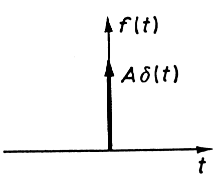
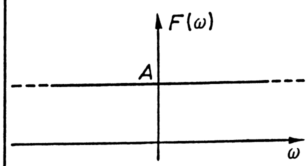
Zeitfunktion $f(t)$ ○—● $F(\omega)$ Spektraldichte

Nr.	Bild der Zeitfunktion	Formel für $f(t)$	Formel für $F(\omega)$	Bild der Spektraldichte
1	 Rechteck-Impuls	$f(t) = A\cdot\Pi_{\frac{\tau}{2}}(t) = \begin{cases} A, & \lvert t\rvert<\tau/2 \\ 0, & \lvert t\rvert>\tau/2 \end{cases}$	$F(\omega) = A\cdot\tau\,\frac{\sin(\omega\tau/2)}{\omega\tau/2}$	
2	 Dreieck-Impuls	$f(t) = A\cdot\Lambda_\tau(t) = \begin{cases} A(\Lambda-\frac{\lvert t\rvert}{\tau}), & \lvert t\rvert<\tau \\ 0, & \lvert t\rvert>\tau \end{cases}$	$F(\omega) = A\cdot\tau\left(\frac{\sin(\omega\tau/2)}{\omega\tau/2}\right)^2$	
3	 $\cos^2$-Impuls	$f(t) = \begin{cases} A\cdot\cos^2(\frac{\pi}{2\tau}t), & \lvert t\rvert<\tau \\ 0, & \lvert t\rvert>\tau \end{cases}$	$F(\omega) = A\tau\left\{\frac{\sin\omega\tau}{\omega\tau} + \frac{1}{2}\,\frac{\sin(\omega+\omega_0)\tau}{(\omega+\omega_0)\tau} + \frac{1}{2}\,\frac{\sin(\omega-\omega_0)\tau}{(\omega-\omega_0)\tau}\right\};\ \omega_0 = \frac{\pi}{\tau}$	
4	 Verrundeter Impuls, Roll-Off-Faktor r	$f(t) = \begin{cases} A, & \lvert t\rvert<\frac{\tau}{2}(1-r) \\ 0, & \lvert t\rvert>\frac{\tau}{2}(1+r) \end{cases}$ $f(t) = \frac{A}{2}\cdot\left\{1-\sin\left[\frac{\pi}{r\cdot\tau}(t-\frac{\tau}{2})\right]\right\}$, $\frac{\tau}{2}(1-r)<\lvert t\rvert<\frac{\tau}{2}(1+r)$ $r=0$ Rechteck-Impuls $r=1$ $\cos^2$-Impuls	$F(\omega) = A\,\frac{\pi^2}{4}\cdot\tau\cdot\frac{\cos(\omega\cdot r\cdot\tau/2)}{(\pi/2)^2-(\omega\cdot r\cdot\tau/2)^2}\cdot\frac{\sin(\omega\cdot\tau/2)}{\omega\cdot\tau/2}$	
5	 Gauß-Impuls	$f(t) = A\cdot e^{-\pi\left(\frac{t}{2t_m}\right)^2},\ t_m = \frac{\pi}{2\omega_m}$	$F(\omega) = A\,\frac{\pi}{\omega_m}\cdot e^{-\pi\left(\frac{\omega}{2\omega_m}\right)^2}$, $\omega_m = \frac{\pi}{2t_m} = \frac{\pi}{\tau}$	
6	 Modulierter Rechteck-Impuls	$f(t) = \begin{cases} A\cdot\cos(\omega_0 t), & \lvert t\rvert<\tau \\ 0, & \lvert t\rvert>\tau \end{cases}$ $\omega_0 = \frac{2\pi}{T}$	$F(\omega) = A\tau\left\{\frac{\sin(\omega+\omega_0)\tau}{(\omega+\omega_0)\tau} + \frac{\sin(\omega-\omega_0)\tau}{(\omega-\omega_0)\tau}\right\}$	
7	 Dirac-Impuls	$f(t) = A\cdot\delta(t) = A\cdot\frac{d\sigma(t)}{dt}$	$F(\omega) = F_\delta(\omega) = A$	

Zeitfunktion		$f(t)$ ○—● $F(\omega)$		Spektraldichte
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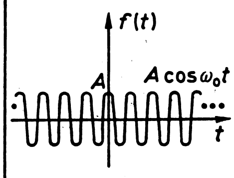
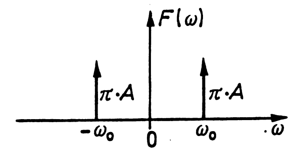
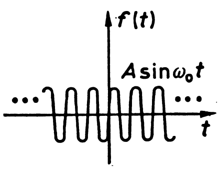
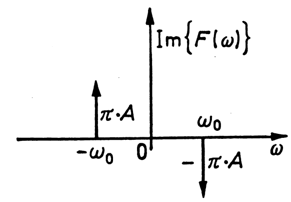
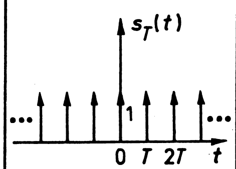
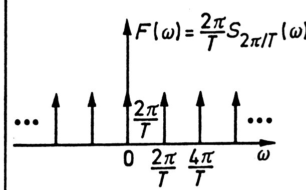
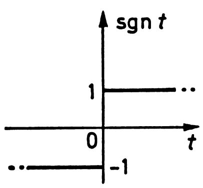
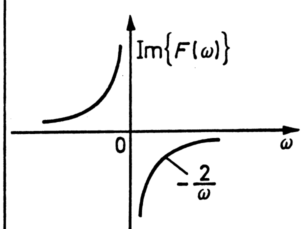
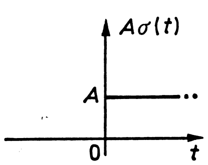
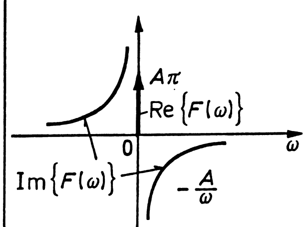
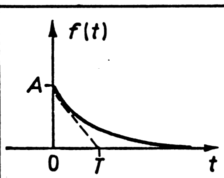
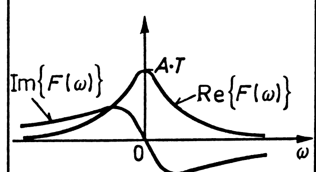
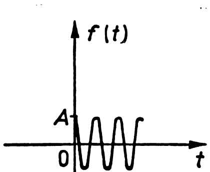
8	 cos-Schwingung	$f(t) = A \cdot \cos \omega_0 t$	$F(\omega) = A\pi \{\delta(\omega+\omega_0) + \delta(\omega-\omega_0)\}$	
9	 sin-Schwingung	$f(t) = A \cdot \sin \omega_0 t$	$F(\omega) = jA \cdot \pi \{\delta(\omega+\omega_0) - \delta(\omega-\omega_0)\}$	
10	 δ-Kamm	$f(t) = s_T(t) = \sum_{n=-\infty}^{\infty} \delta(t-nT)$	$F(\omega) = \omega_0 S_{\omega_0}(\omega) = \omega_0 \sum_{n=-\infty}^{\infty} \delta(\omega - n\omega_0)$; $\omega_0 = \frac{2\pi}{T}$	
11	 Signum-Funktion	$f(t) = \operatorname{sgn} t = \begin{cases} 1 & , t > 0 \\ -1 & , t < 0 \end{cases}$	$F(\omega) = 2/j\omega = -j\,2/\omega$	
12	 Sprungfunktion	$f(t) = A\sigma(t) = A\int_{-\infty}^{t} \delta(\tau)\,d\tau = \begin{cases} A, & t > 0 \\ 0, & t < 0 \end{cases}$	$F(\omega) = A\left\{\pi\delta(\omega) + \frac{1}{j\omega}\right\}$	
13	 Exponential-funktion (Entladekurve)	$f(t) = \begin{cases} A \cdot e^{-t/T} & , t > 0 \\ 0 & , t < 0 \end{cases}$	$F(\omega) = \frac{A \cdot T}{1 + j\omega T} = A \cdot T \cdot \frac{1 - j\omega T}{1 + (\omega T)^2}$	
14	 Eingeschaltete cos-Schwingung	$f(t) = A \cdot \cos(\omega_0 t) \cdot \sigma(t)$	$F(\omega) = A\,\frac{\pi}{2}\{\delta(\omega+\omega_0) + \delta(\omega-\omega_0)\} + \frac{j\omega A}{\omega_0^2 - \omega^2}$