
Power stage transfer function cheatsheet

Power stage transfer function cheatsheet - Buck

	G_{vd}	G_{id}	G_{vg}	G_{ig}
G_0	V_g	$\frac{V_g}{R}$	D	$\frac{D}{R}$
ω_z	∞	$\frac{1}{RC}$	∞	$\frac{1}{RC}$
ω_0	$\frac{1}{\sqrt{LC}}$	$\frac{1}{\sqrt{LC}}$	$\frac{1}{\sqrt{LC}}$	$\frac{1}{\sqrt{LC}}$
Q	$R\sqrt{\frac{C}{L}}$	$R\sqrt{\frac{C}{L}}$	$R\sqrt{\frac{C}{L}}$	$R\sqrt{\frac{C}{L}}$

$$G_{vd,id,vg,ig} = G_0 \cdot \frac{1 + \frac{s}{\omega_z}}{1 + \frac{s}{\omega_0 Q} + \left(\frac{s}{\omega_0}\right)^2}$$

Power stage transfer function cheatsheet - Boost

	G_{vd}	G_{id}	G_{vg}	G_{ig}
G_0	$\frac{V}{D'}$	$\frac{2V}{RD^2}$	$\frac{1}{D'}$	$\frac{1}{RD^2}$
ω_z	$-\frac{RD^2}{L}$	$\frac{2}{RC}$	∞	$\frac{1}{RC}$
ω_0	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$
Q	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$

$$G_{vd,id,vg,ig} = G_0 \cdot \frac{1 + \frac{s}{\omega_z}}{1 + \frac{s}{\omega_0 Q} + \left(\frac{s}{\omega_0}\right)^2}$$

Power stage transfer function cheatsheet - IBB

	G_{vd}	G_{id}	G_{vg}	G_{ig}
G_0	$\frac{V}{DD'}$	$-\frac{V(1+D)}{RDD^2}$	$-\frac{D}{D'}$	$\frac{D}{RD^2}$
ω_z	$-\frac{RD^2}{DL}$	$\frac{1+D}{RC}$	∞	$\frac{1}{RC}$
ω_0	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$	$\frac{D'}{\sqrt{LC}}$
Q	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$	$RD'\sqrt{\frac{C}{L}}$

$$G_{vd,id,vg,ig} = G_0 \cdot \frac{1 + \frac{s}{\omega_z}}{1 + \frac{s}{\omega_0 Q} + \left(\frac{s}{\omega_0}\right)^2}$$