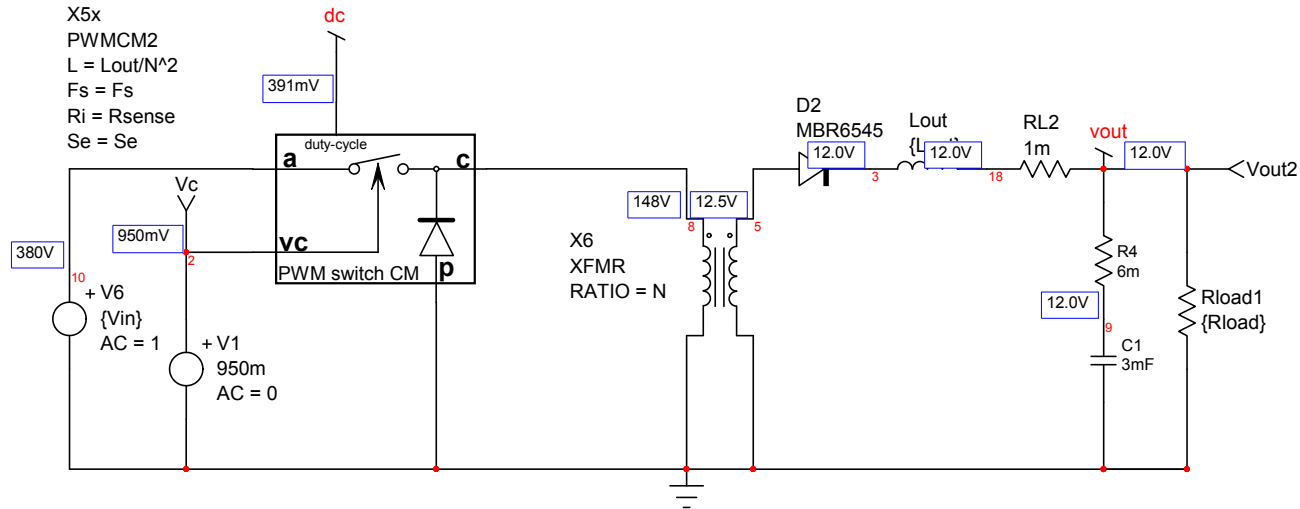


# Small-signal gains, control to output, input to output

## Forward converter, current-mode



\*\*\*\*\*

\* DEFAULT PARAMETERS \*

\*\*\*\*\*

\*\*\*\* mainckt

VOUT = 1.200e+001  
 LOUT = 2.500e-005  
 LMAG = 1.000e-002  
 FS = 1.000e+005  
 N = 8.500e-002  
 RSENSE = 4.800e-001  
 RLOAD = 6.000e-001  
 VIN = 3.800e+002  
 SE = 1.824e+004  
 SN = 3.313e+004  
 MC = 1.551e+000  
 D = 3.900e-001  
 D' = 6.100e-001  
 A = 9.033e-001

parameters

Vout=12  
 Lout=25u  
 Lmag=10mH  
 Fs=100k  
 N=0.085  
 Rsense=0.48  
 Rload=600m  
 Vin=380

Natural ramp  
 comp. from  $L_{mag}$

$$Se = (Vin/Lmag) * Rsense$$

$$Sn = (((N * Vin - Vout) / Lout) * N) * Rsense$$

$$Mc = 1 + (Se / Sn)$$

$$D = 0.39$$

$$D' = 1 - D$$

$$a = 1 / (1 + (Rload / (Fs * Lout)) * (Mc * (1 - D) - 0.5))$$

$$G0 = 20 * \log((Rload / (Rsense * N)) * a)$$

$$b = D * (Mc * D' - (1 - 0.5 * D))$$

$$c = ((Lout * Fs) / Rload) + (Mc * D' - 0.5)$$

$$GVin = 20 * \log(N * b / c)$$

$$G0 = 2.247e+001$$

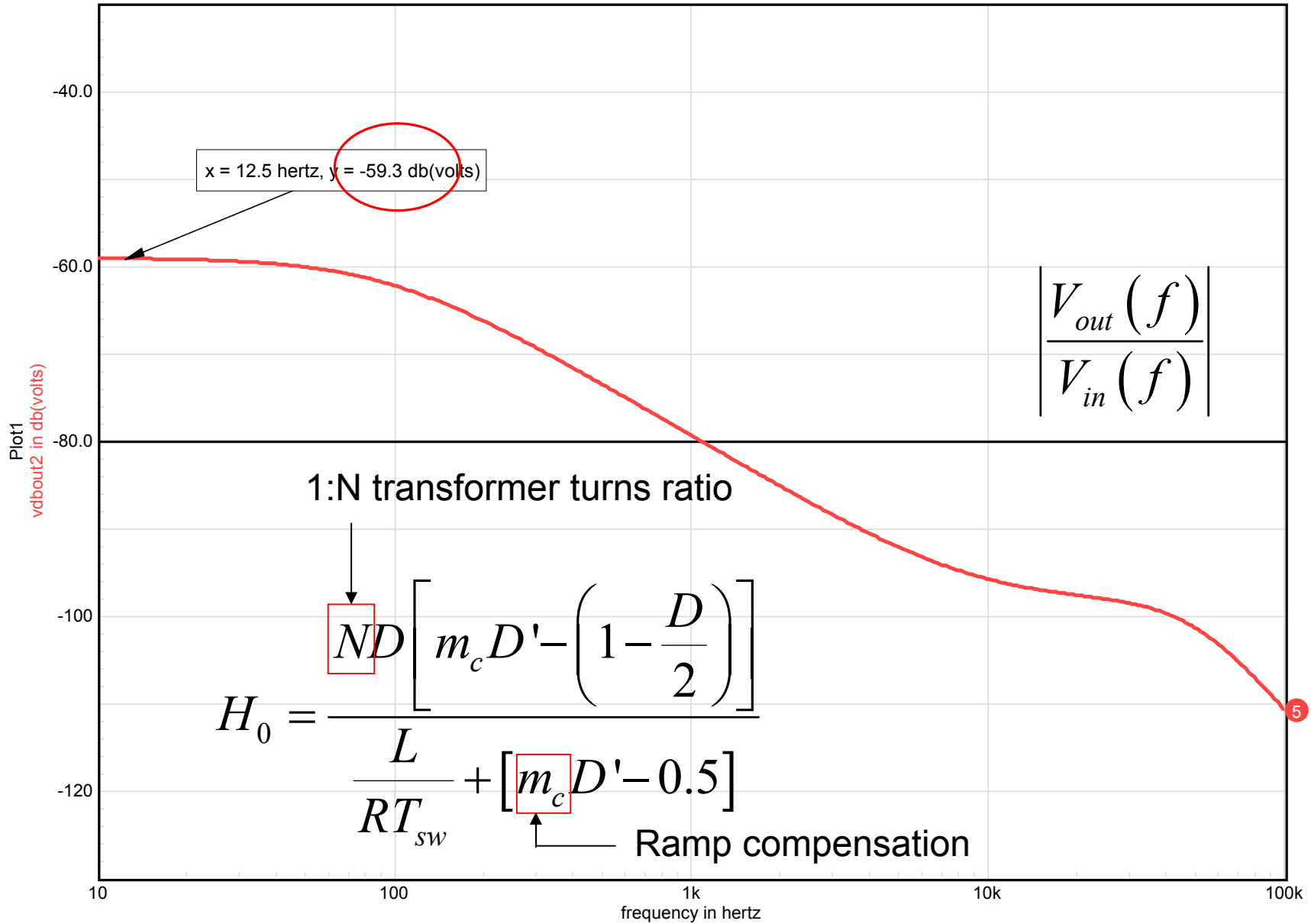
$$B = 5.493e-002$$

$$C = 4.613e+000$$

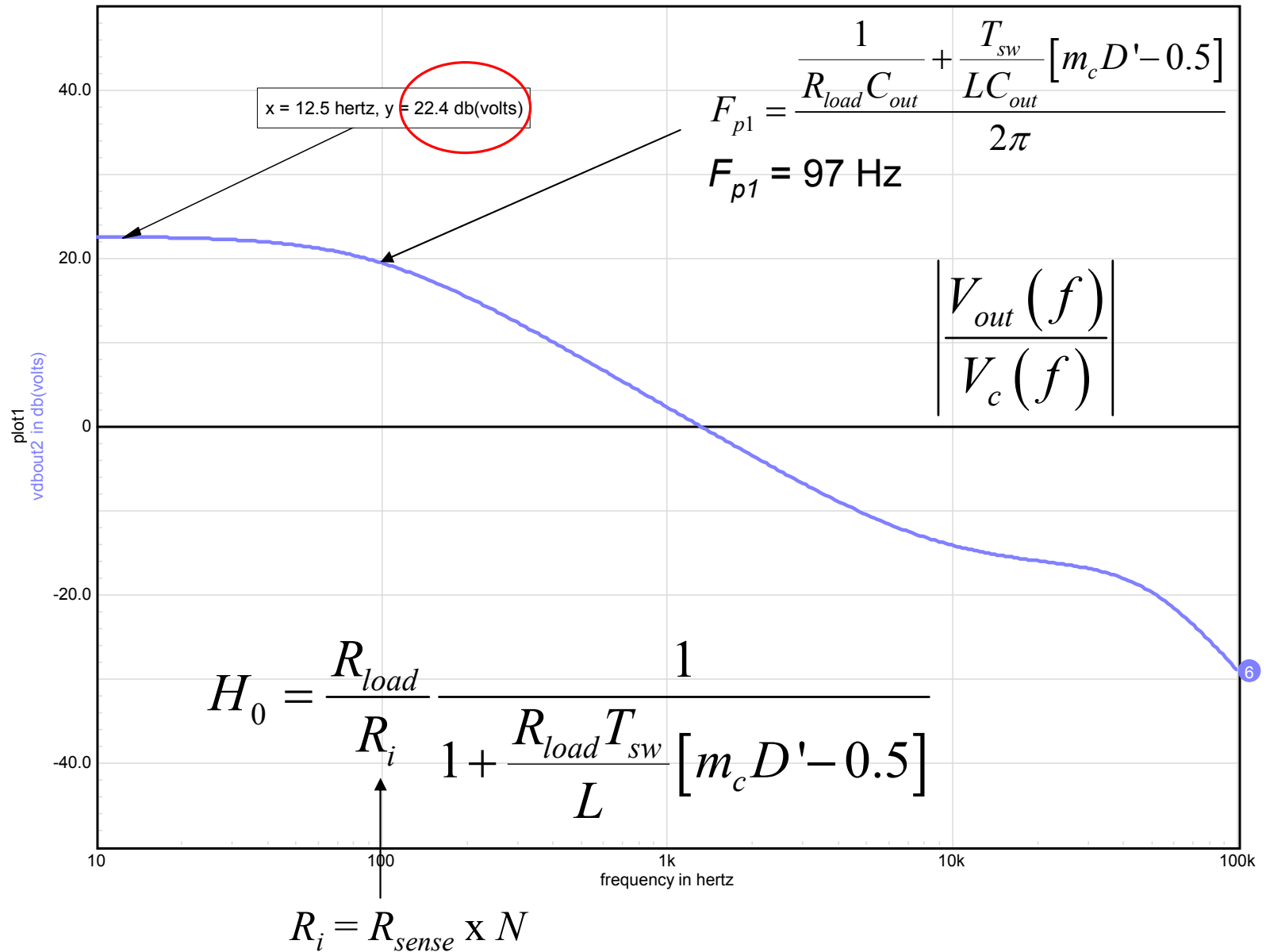
$$GVIN = -5.989e+001$$

Check calculation  
 and simu results.

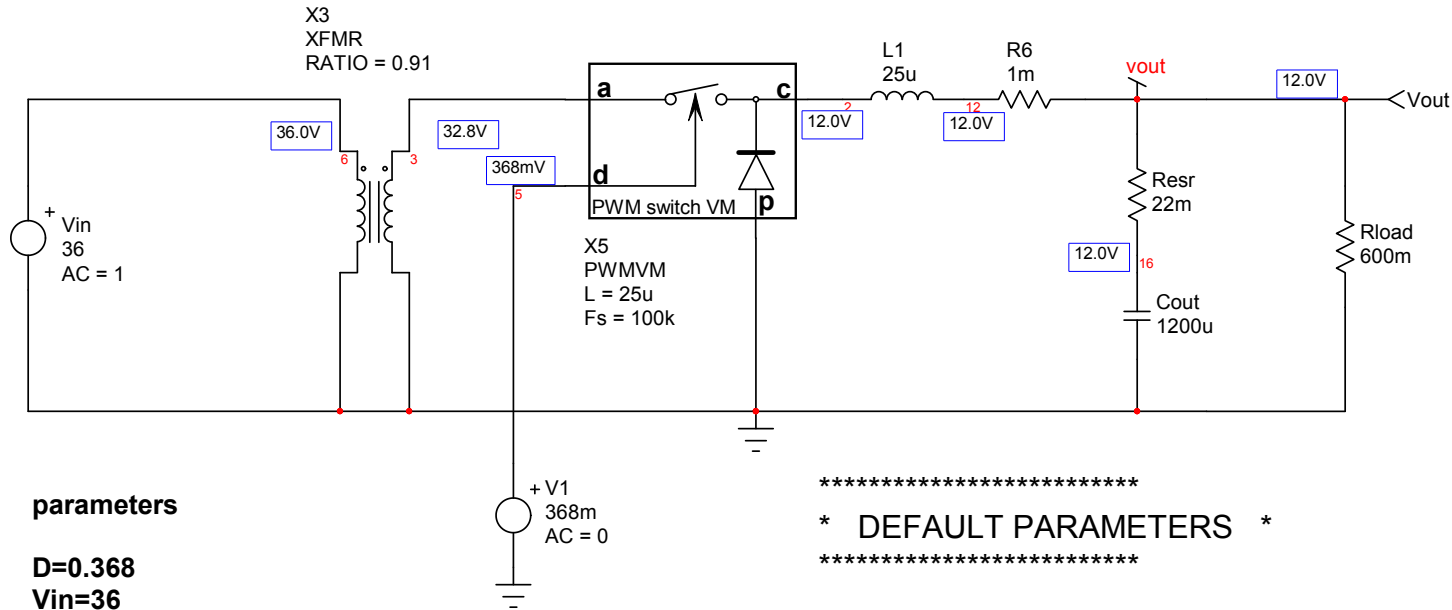
Christophe Basso



6 vdbout2



# Small-signal gains, control to output, input to output Forward converter, voltage-mode



## parameters

**D=0.368**  
**Vin=36**  
**N=0.91**  
**Vpeak=1**  
 **$G0=20*\log(N*Vin/Vpeak)$**   
 **$GVin=20*\log(N*D)$**

\*\*\*\*\*  
 \* DEFAULT PARAMETERS \*  
 \*\*\*\*\*

\*\*\*\*\* mainckt

**D = 3.680e-001**  
**VIN = 3.600e+001**  
**N = 9.100e-001**  
**VPEAK = 1.000e+000**  
**G0 = 3.031e+001**  
**GVIN = -9.502e+000**

} Check calculation and simu results.

\*\*\*\*\* PWMVM

**L = 7.500e-005**  
**FS = 1.000e+005**

