

bit := 16	number of DAC bits (TDA1541A=16 TDA1540 = 14)
Iref := 2·mA	current DAC reference
VdvCmsb := 7.5·V	voltage across Cmsb (TDA1541A=7.5V TDA1540 = 9.52V cca.)
wc_percent := 11.9·%	worst case %
Fdem := 176.4·KHz	DEM frequency
DEMbits := 7	number of DEM bits (TDA1541A=7 TDA1540 = 10)

$$\text{LSB} := \left[\frac{1}{2^{(\text{bit}+1)}} \right] \quad \text{LSB} = 7.629 \times 10^{-6} \quad \text{half value of LSB (current or voltage)}$$

$$\text{Iwc} := \left(\frac{\text{Iref}}{4} \right) \cdot \text{wc_percent} \quad \text{Iwc} = 59.5 \mu\text{A} \quad \text{worst case p-p ripple current for given \%}$$

$$\text{Vwc} := \text{LSB} \cdot \text{VdvCmsb} \quad \text{Vwc} = 0.057 \text{ mV}$$

$$\text{Zwc} := \frac{\text{Vwc}}{\text{Iwc}} \quad \text{Zwc} = 0.962 \Omega \quad \text{worst case impedance} \leq 1$$

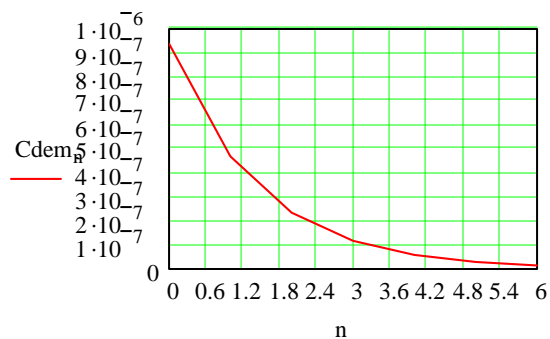
$$\omega_{\text{dem}} := 2 \cdot \pi \cdot \text{Fdem}$$

$$\text{Cmsb} := \frac{1}{\omega_{\text{dem}} \cdot \text{Zwc}} \quad \text{Cmsb} = 0.938 \mu\text{F} \quad \text{Zwc}=1 \text{ wc_percent}=11.45\% \text{ Cmsb}=0.9\mu\text{F}$$

$$n := 0 \dots (\text{DEMbits} - 1)$$

$$\text{Cdem}_n := \frac{\text{Cmsb}}{2^n}$$

$$\text{Cdem} = \begin{pmatrix} 938.182 \\ 469.091 \\ 234.546 \\ 117.273 \\ 58.636 \\ 29.318 \\ 14.659 \end{pmatrix} \text{ nF}$$



Cmsb = 2 x 680 nF demFo=176.4KHz 17.3% Zwc=0.662 Ω
 Cmsb = 2 x 470 nF demFo=176.4KHz 11.9% Zwc=0.962 Ω