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ENG 342

A ) A Filter is a circuit capable of passing or amplifying certain frequencies while attenuating other frequencies.

They can be used practically for ;

* DC power supplies: Filters are used to eliminate te undesired high frequencies like noise that are present on AC input lines.
* Radio communications: Filters enable radio receivers to only “see” the desired signal while rejecting all other signals.
* Analog-to-digital conversion: They are placed in front of an ADC input to minimize aliasing.

B) Designing a Low-Pass Filter with 0.005Ω resistor and 0.01F capacitor

A 100v Amplitude was selected with a frequency of 1hz for the sine wave source.

NUM(S)/DEN(S)

Sine wave Transfer Function

Scope

C) Determining the Cut-Off frequency

The cut-off frequency is calculated by F=1/2\*(Pi\*R\*C)

When R=0.005Ω and C=0.01F

F=1/2 \*(0.005\*0.01)=3189.099Hz

D) Design Output

The transfer function equation for the circuit is given as (1/RC)/(S+1/RC)

When R=0.005Ω and C=0.01F

Transfer Function=(1/0.005\*0.01)/(S+(1/0.005\*0.01))=(20000)/(S+20000)