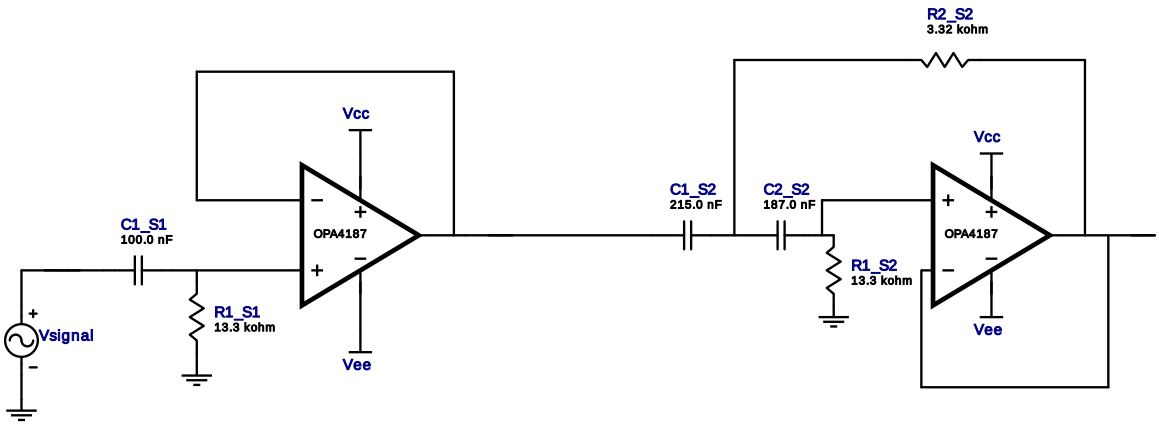
Type : Highpass
Response : Butterworth
Order : 3
Number of Stages : 2

Filter Design Report

Design : Highpass Filter - 3rd order Butterworth
Design ID: 65

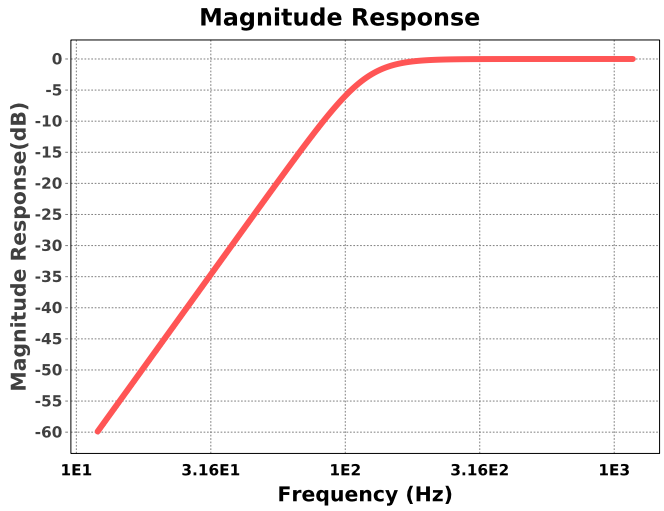


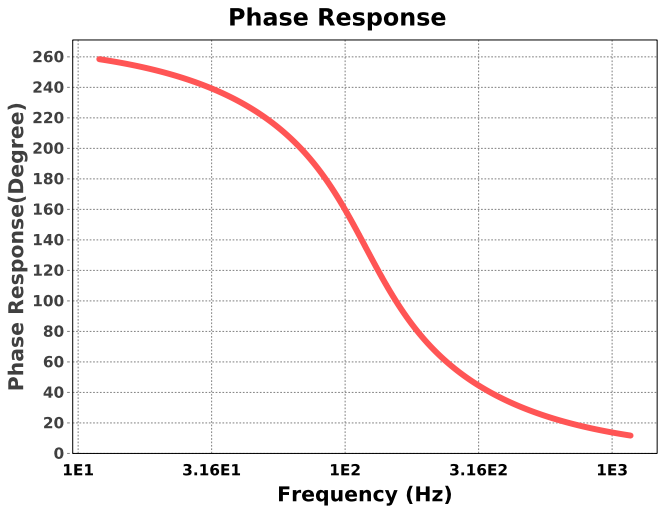
Electrical BOM

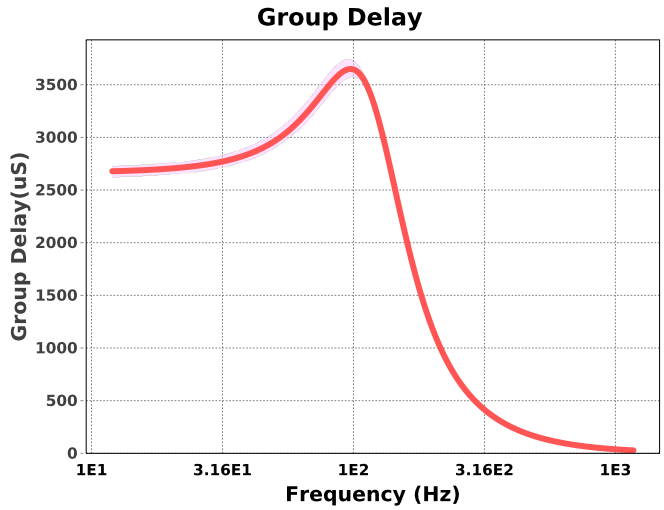
#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	OPA4187	GbwTyp= 0.55MHz VccMax= 36V VccMin= 4.5V	1
2.	A1_S2	Texas Instruments Inc.	OPA4187	GbwTyp= 0.55MHz VccMax= 36V VccMin= 4.5V	1
3.	C1_S1	Generic	Ideal	Cap= 100.0 nF Tolerance= 2.0 %	1
4.	C1_S2	Generic	Ideal	Cap= 215.0 nF Tolerance= 2.0 %	1
5.	C2_S2	Generic	Ideal	Cap= 187.0 nF Tolerance= 2.0 %	1
6.	R1_S1	Generic	Ideal	Res= 13300.0ohm Tolerance= 1%	1
7.	R1_S2	Generic	Ideal	Res= 13300.0ohm Tolerance= 1%	1
8.	R2_S2	Generic	Ideal	Res= 3320.0ohm Tolerance= 1%	1

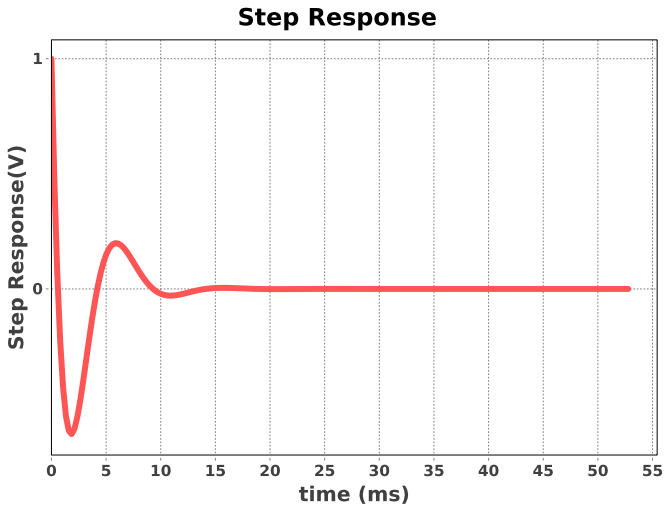
Sensitivity Analysis

#	Name	Series	Tolerance
1.	Cap	E48	2%
2.	Res	E96	1%









Design Inputs

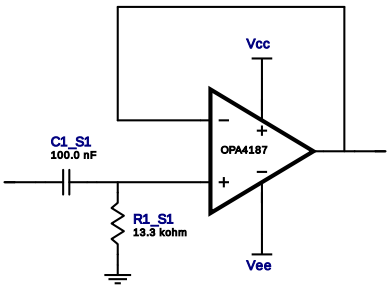
#	Name	Value	Description
1.	FilterType	highpass	
2.	FilterResponse	Butterworth	
3.	FilterOrder	3.0	
4.	FilterTopology	Single Pole	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	120.0	
7.	StopbandAttenuation	-60.0	
8.	StopbandFrequency	12.0	
9.	Gain	1.0	
10.	DualSupply	+/-5.00 V	Power supply(s) to active chips
11.	ResistorTolerance	E96	Resistor series - 1% Passive resistor tolerance
12.	CapacitorTolerance	E48	Capacitor series - 2% Passive capacitor tolerance

Design Assistance

1. **OPA4187** Product Folder : http://www.ti.com/product/OPA4187 : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency	119.665 Hz
Min GBW Reqd	6.0 kHz
Stage Gain	1.0 V/V
Stage Q	500.0 m
Stage Topology	Single Pole

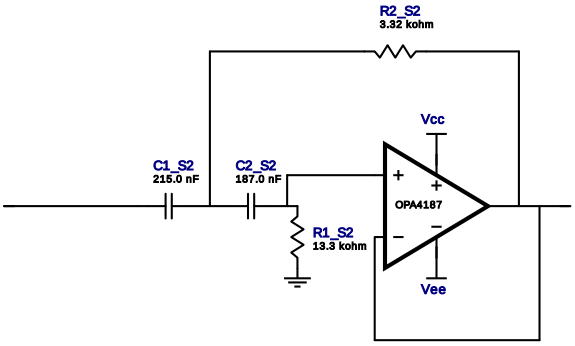


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	OPA4187	GbwTyp= 0.55MHz VccMax= 36V VccMin= 4.5V	1
2.	C1_S1	Generic	Ideal	Cap= 100.0 nF Tolerance= 2.0 %	1
3.	R1_S1	Generic	Ideal	Res= 13300.0ohm Tolerance= 1%	1

Filter Stage :2

Cutoff Frequency	119.45 Hz
Min GBW Reqd	12.0 kHz
Stage Gain	1.0 V/V
Stage Q	998.322 m
Stage Topology	Sallen-Key



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S2	Texas Instruments Inc.	OPA4187	GbwTyp= 0.55MHz VccMax= 36V VccMin= 4.5V	1
2.	C1_S2	Generic	Ideal	Cap= 215.0 nF Tolerance= 2.0 %	1
3.	C2_S2	Generic	Ideal	Cap= 187.0 nF Tolerance= 2.0 %	1
4.	R1_S2	Generic	Ideal	Res= 13300.0ohm Tolerance= 1%	1
5.	R2_S2	Generic	Ideal	Res= 3320.0ohm Tolerance= 1%	1