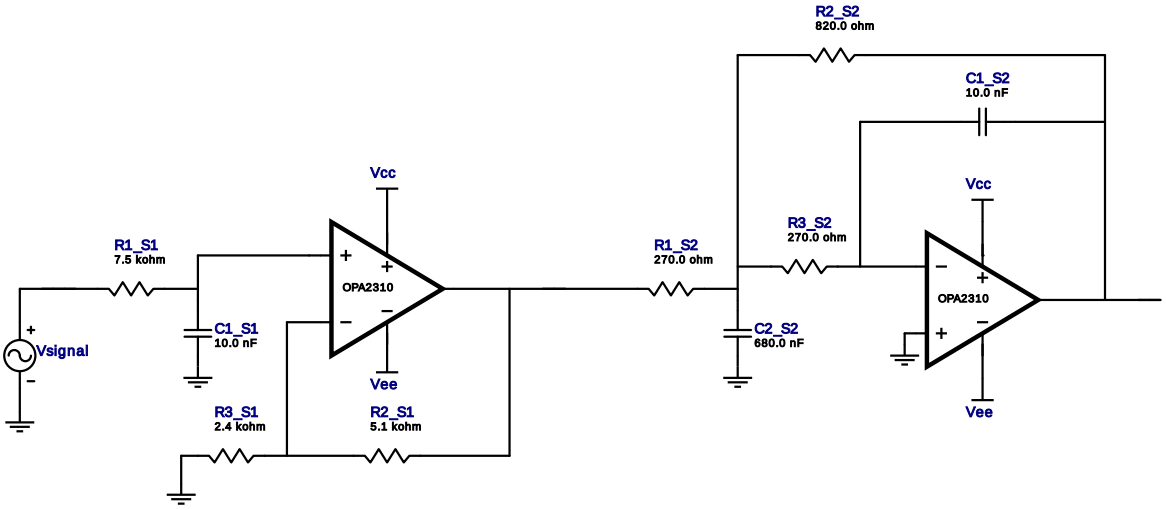
Type : Lowpass
Response : Chebyshev
Order : 3
Number of Stages : 2

Filter Design Report

Design : Lowpass Filter - 3rd order Chebyshev
Design ID: 6

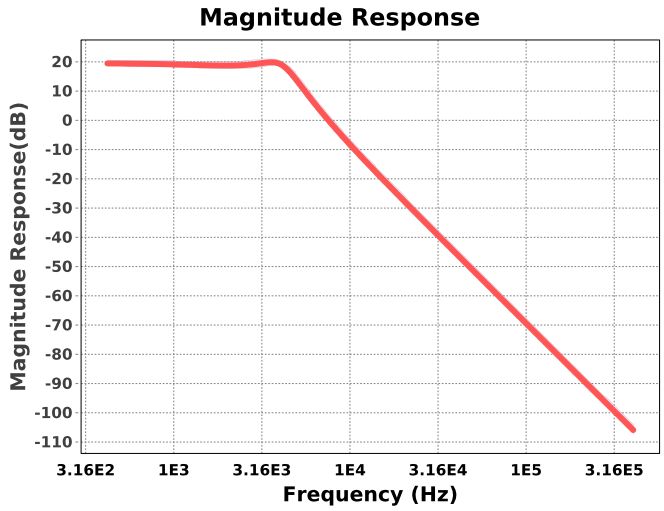


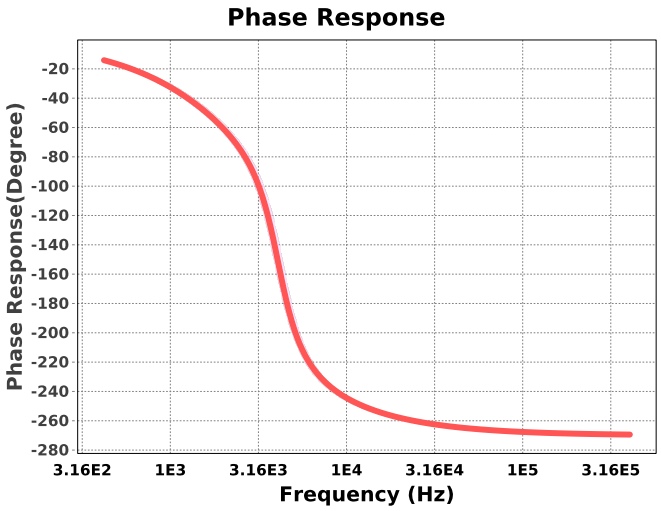
Electrical BOM

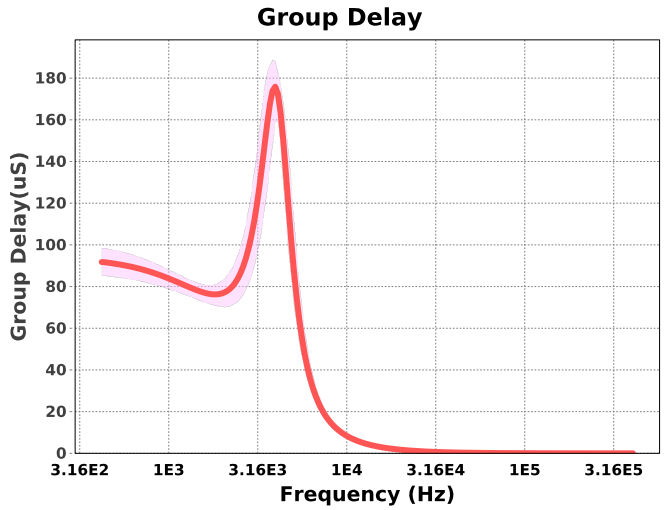
#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	OPA2310	GbwTyp= 3MHz VccMax= 5.5V VccMin= 1.5V	1
2.	A1_S2	Texas Instruments Inc.	OPA2310	GbwTyp= 3MHz VccMax= 5.5V VccMin= 1.5V	1
3.	C1_S1	Generic	Ideal	Cap= 10.0 nF Tolerance= 5.0 %	1
4.	C1_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 5.0 %	1
5.	C2_S2	Generic	Ideal	Cap= 680.0 nF Tolerance= 5.0 %	1
6.	R1_S1	Generic	Ideal	Res= 7500.0ohm Tolerance= 5%	1
7.	R1_S2	Generic	Ideal	Res= 270.0ohm Tolerance= 5%	1
8.	R2_S1	Generic	Ideal	Res= 5100.0ohm Tolerance= 5%	1
9.	R2_S2	Generic	Ideal	Res= 820.0ohm Tolerance= 5%	1
10.	R3_S1	Generic	Ideal	Res= 2400.0ohm Tolerance= 5%	1
11.	R3_S2	Generic	Ideal	Res= 270.0ohm Tolerance= 5%	1

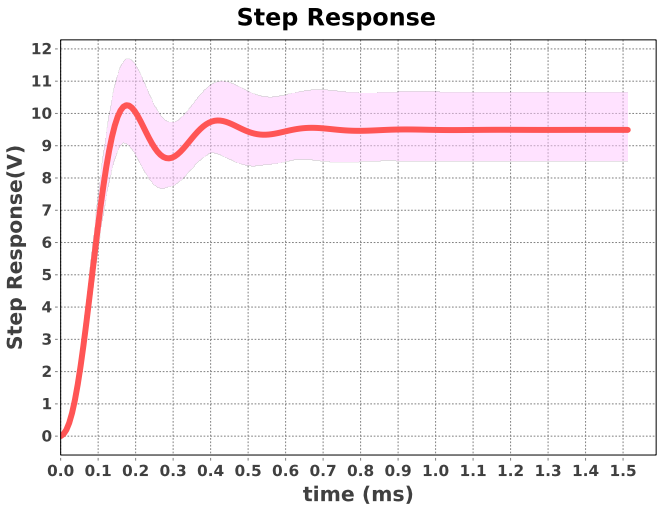
Sensitivity Analysis

#	Name	Series	Tolerance
1.	Cap	E24	5%
2.	Res	E24	5%









Design Inputs

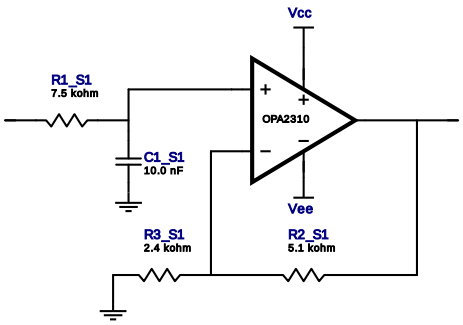
#	Name	Value	Description
1.	FilterType	lowpass	
2.	FilterResponse	Chebyshev	
3.	FilterOrder	3.0	
4.	FilterTopology	Single Pole	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	4.2 k	
7.	StopbandAttenuation	-66.108	
8.	StopbandFrequency	42.0 k	
9.	Gain	10.0	
10.	SingleSupply	5.0	Power supply(s) to active chips
11.	ResistorTolerance	E24	Resistor series - 5% Passive resistor tolerance
12.	CapacitorTolerance	E24	Capacitor series - 5% Passive capacitor tolerance

Design Assistance

1. **OPA2310** Product Folder : http://www.ti.com/product/OPA2310 : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency	2.122 kHz
Min GBW Reqd	328.168 kHz
Stage Gain	3.125 V/V
Stage Q	500.0 m
Stage Topology	Single Pole



Electrical BOM

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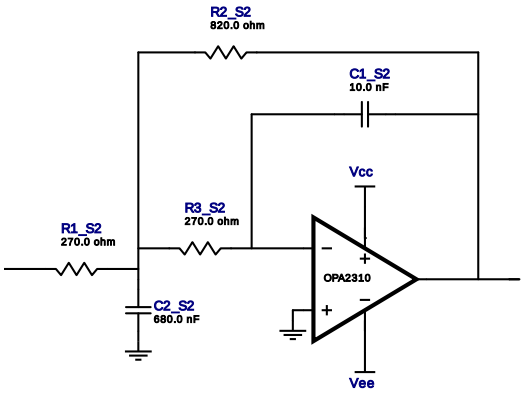
3.	R1_S1	Generic	Ideal	Res= 7500.0ohm Tolerance= 5%	1
4.	R2_S1	Generic	Ideal	Res= 5100.0ohm Tolerance= 5%	1
5.	R3_S1	Generic	Ideal	Res= 2400.0ohm Tolerance= 5%	1

Filter Stage :2

Cutoff Frequency	4.102 kHz
Min GBW Reqd	2.672 MHz
Stage Gain	3.037 V/V
Stage Q	2.031
Stage Topology	Multiple Feedback



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S2	Texas Instruments Inc.	OPA2310	GbwTyp= 3MHz VccMax= 5.5V VccMin= 1.5V	1
2.	C1_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 5.0 %	1
3.	C2_S2	Generic	Ideal	Cap= 680.0 nF Tolerance= 5.0 %	1
4.	R1_S2	Generic	Ideal	Res= 270.0ohm Tolerance= 5%	1
5.	R2_S2	Generic	Ideal	Res= 820.0ohm Tolerance= 5%	1
6.	R3_S2	Generic	Ideal	Res= 270.0ohm Tolerance= 5%	1