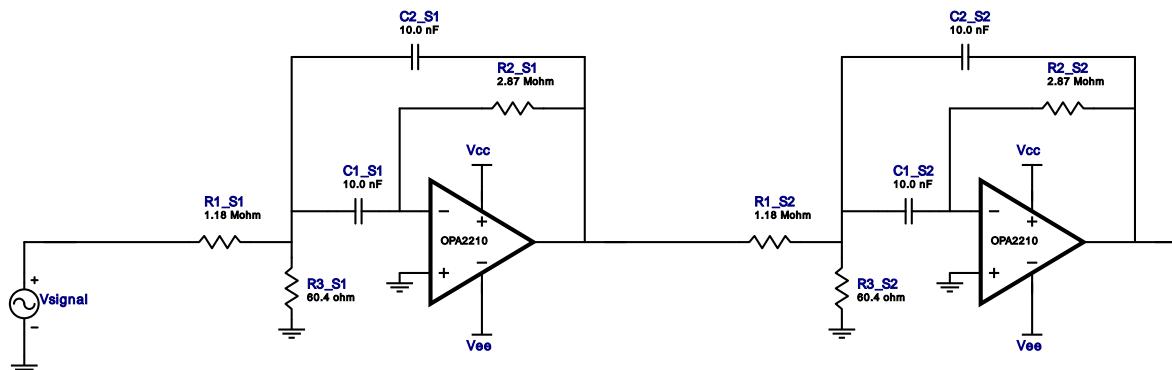


Type : Bandpass
 Response : Bessel
 Order : 4
 Number of Stages : 2

Filter Design Report

Design : Bandpass Filter - 4th order Bessel
 Design ID: 4

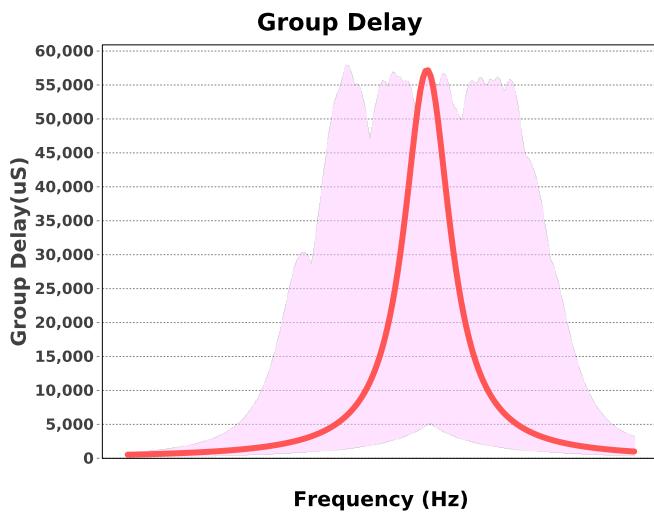
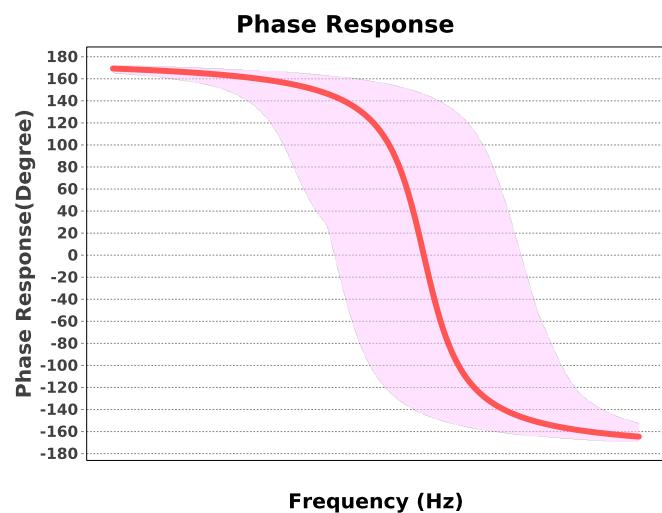
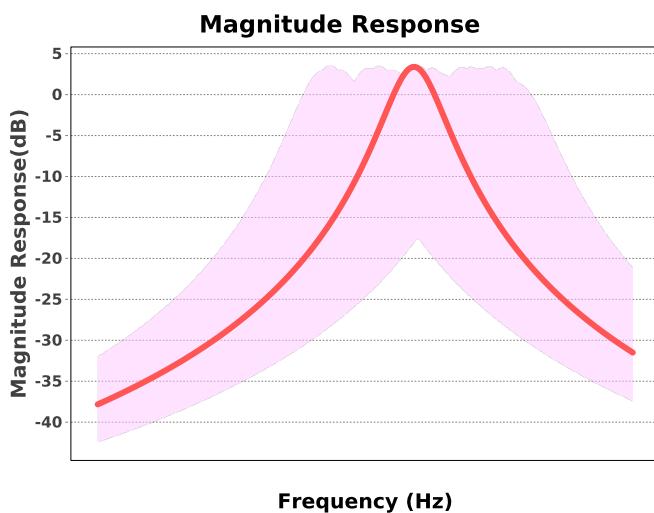


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	OPA2210	GbwTyp= 18MHz VccMax= 36V VccMin= 4.5V	1
2.	A1_S2	Texas Instruments Inc.	OPA2210	GbwTyp= 18MHz VccMax= 36V VccMin= 4.5V	1
3.	C1_S1	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
4.	C1_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
5.	C2_S1	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
6.	C2_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
7.	R1_S1	Generic	Ideal	Res= 1180000.0ohm Tolerance= 1%	1
8.	R1_S2	Generic	Ideal	Res= 1180000.0ohm Tolerance= 1%	1
9.	R2_S1	Generic	Ideal	Res= 2870000.0ohm Tolerance= 1%	1
10.	R2_S2	Generic	Ideal	Res= 2870000.0ohm Tolerance= 1%	1
11.	R3_S1	Generic	Ideal	Res= 60.40000000000006ohm Tolerance= 1%	1
12.	R3_S2	Generic	Ideal	Res= 60.40000000000006ohm Tolerance= 1%	1

Sensitivity Analysis

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



Design Inputs

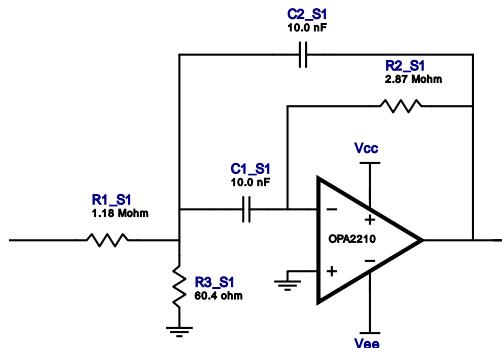
#	Name	Value	Description
1.	FilterType	bandpass	
2.	FilterResponse	Bessel	
3.	FilterOrder	4.0	
4.	FilterTopology	Multiple Feedback	
5.	NumberOfStages	2.0	
6.	CenterFrequency	1.2 k	
7.	StopbandAttenuation	-35.869	
8.	PassbandBandwidth	10.0	
9.	StopbandBandwidth	100.0	
10.	Gain	1.122	
11.	DualSupply	+/-5.00 V	Power supply(s) to active chips
12.	ResistorTolerance	E96	Resistor series - 1% Passive resistor tolerance
13.	CapacitorTolerance	E48	Capacitor series - 2% Passive capacitor tolerance

Design Assistance

1. **OPA2210 Product Folder** : <http://www.ti.com/product/OPA2210> : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency 1.209 kHz
 Min GBW Reqd 15.926 MHz
 Stage Gain 1.216 V/V
 Stage Q 108.994
 Stage Topology Multiple Feedback

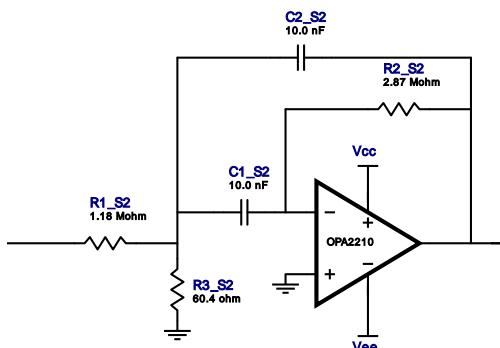


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	OPA2210	GbwTyp= 18MHz VccMax= 36V VccMin= 4.5V	1
2.	C1_S1	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
3.	C2_S1	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
4.	R1_S1	Generic	Ideal	Res= 1180000.0ohm Tolerance= 1%	1
5.	R2_S1	Generic	Ideal	Res= 2870000.0ohm Tolerance= 1%	1
6.	R3_S1	Generic	Ideal	Res= 60.40000000000006ohm Tolerance= 1%	1

Filter Stage :2

Cutoff Frequency	1.209 kHz
Min GBW Reqd	16.011 MHz
Stage Gain	1.216 V/V
Stage Q	108.994
Stage Topology	Multiple Feedback



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S2	Texas Instruments Inc.	OPA2210	GbwTyp= 18MHz VccMax= 36V VccMin= 4.5V	1
2.	C1_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
3.	C2_S2	Generic	Ideal	Cap= 10.0 nF Tolerance= 2.0 %	1
4.	R1_S2	Generic	Ideal	Res= 1180000.0ohm Tolerance= 1%	1
5.	R2_S2	Generic	Ideal	Res= 2870000.0ohm Tolerance= 1%	1
6.	R3_S2	Generic	Ideal	Res= 60.40000000000006ohm Tolerance= 1%	1

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