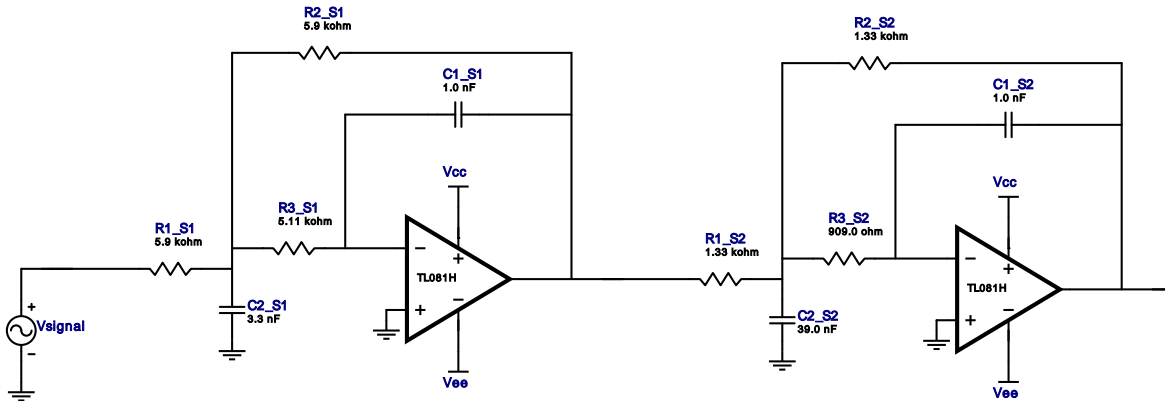


Type : Lowpass
Response : Chebyshev
Order : 4
Number of Stages : 2

Filter Design Report

Design : Lowpass Filter - 4th order Chebyshev
Design ID: 142

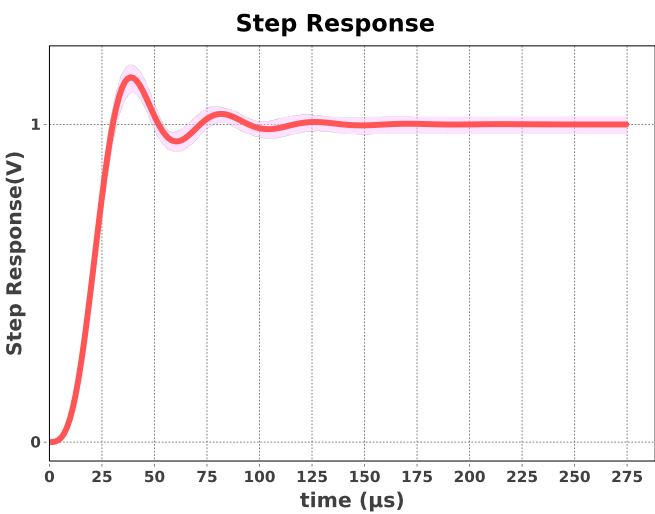
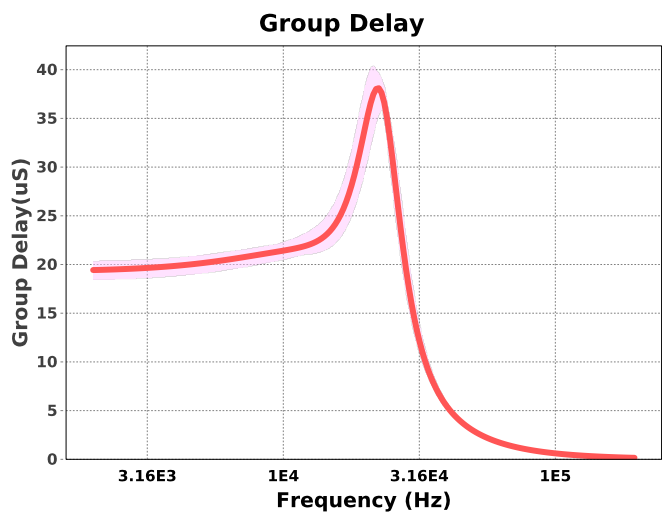
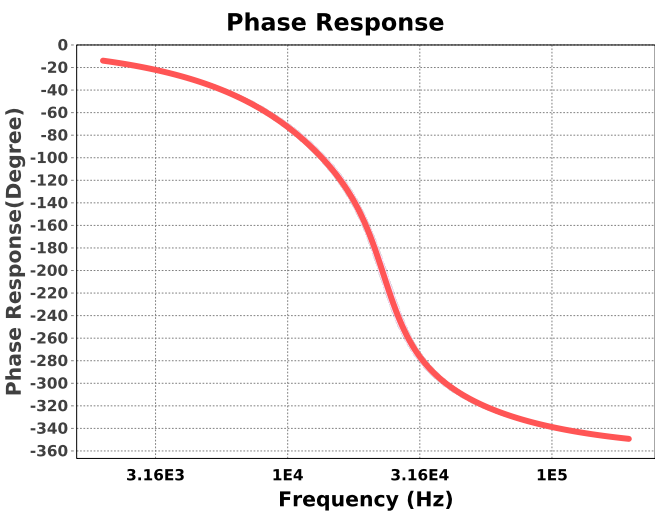
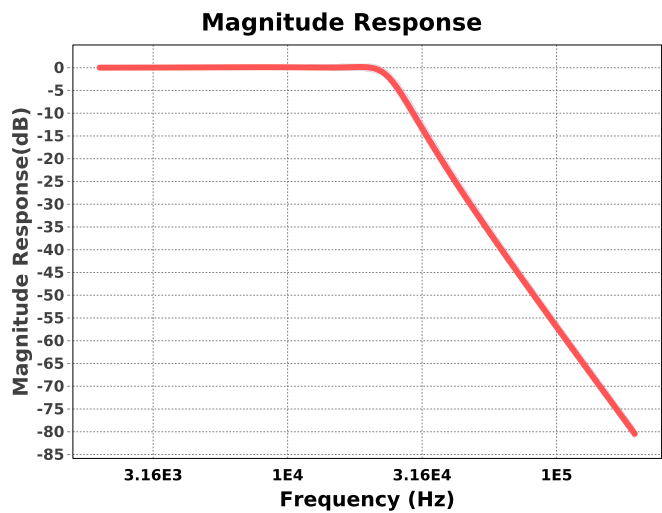


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	TL081H	GbwTyp= 5.25MHz VccMax= 40V VccMin= 4.5V	1
2.	A1_S2	Texas Instruments Inc.	TL081H	GbwTyp= 5.25MHz VccMax= 40V VccMin= 4.5V	1
3.	C1_S1	Generic	Ideal	Cap= 1.0 nF Tolerance= 5.0 %	1
4.	C1_S2	Generic	Ideal	Cap= 1.0 nF Tolerance= 5.0 %	1
5.	C2_S1	Generic	Ideal	Cap= 3.3 nF Tolerance= 5.0 %	1
6.	C2_S2	Generic	Ideal	Cap= 39.0 nF Tolerance= 5.0 %	1
7.	R1_S1	Generic	Ideal	Res= 5900.0ohm Tolerance= 1%	1
8.	R1_S2	Generic	Ideal	Res= 1330.0ohm Tolerance= 1%	1
9.	R2_S1	Generic	Ideal	Res= 5900.0ohm Tolerance= 1%	1
10.	R2_S2	Generic	Ideal	Res= 1330.0ohm Tolerance= 1%	1
11.	R3_S1	Generic	Ideal	Res= 5110.0ohm Tolerance= 1%	1
12.	R3_S2	Generic	Ideal	Res= 909.0ohm Tolerance= 1%	1

Sensitivity Analysis

#	Name	Series	Tolerance
1.	Cap	E24	5%
2.	Res	E48	1%



Design Inputs

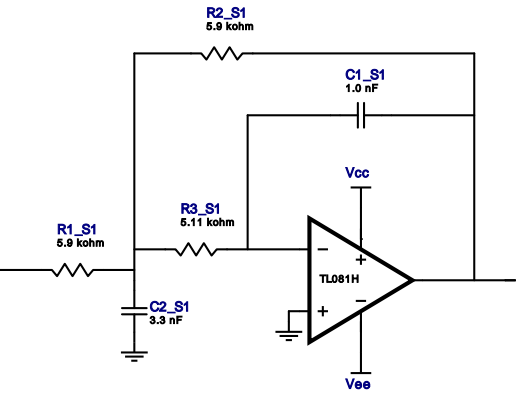
#	Name	Value	Description
1.	FilterType	lowpass	
2.	FilterResponse	Chebyshev	
3.	FilterOrder	4.0	
4.	FilterTopology	Multiple Feedback	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	20.0 k	
7.	StopbandAttenuation	-81.546	
8.	StopbandFrequency	200.0 k	
9.	Gain	1.0	
10.	DualSupply	+/-5.00 V	Power supply(s) to active chips
11.	ResistorTolerance	E48	Resistor series - 1% Passive resistor tolerance
12.	CapacitorTolerance	E24	Capacitor series - 5% Passive capacitor tolerance

Design Assistance

1. **TL081H** Product Folder : <http://www.ti.com/product/TL081H> : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency 15.956 kHz
Min GBW Req'd 976.82 kHz
Stage Gain 1.0 V/V
Stage Q 618.769 m
Stage Topology Multiple Feedback

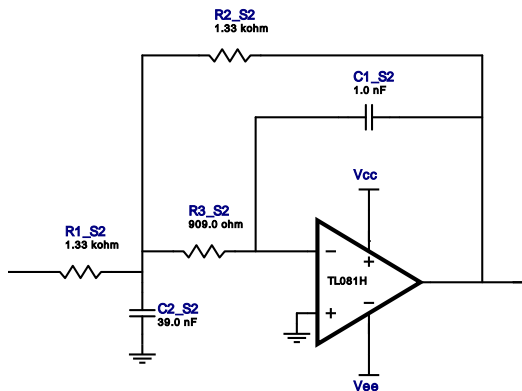


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S1	Texas Instruments Inc.	TL081H	GbwTyp= 5.25MHz VccMax= 40V VccMin= 4.5V	1
2.	C1_S1	Generic	Ideal	Cap= 1.0 nF Tolerance= 5.0 %	1
3.	C2_S1	Generic	Ideal	Cap= 3.3 nF Tolerance= 5.0 %	1
4.	R1_S1	Generic	Ideal	Res= 5900.0ohm Tolerance= 1%	1
5.	R2_S1	Generic	Ideal	Res= 5900.0ohm Tolerance= 1%	1
6.	R3_S1	Generic	Ideal	Res= 5110.0ohm Tolerance= 1%	1

Filter Stage :2

Cutoff Frequency 23.178 kHz
 Min GBW Req'd 5.035 MHz
 Stage Gain 1.0 V/V
 Stage Q 2.181
 Stage Topology Multiple Feedback



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty
1.	A1_S2	Texas Instruments Inc.	TL081H	GbwTyp= 5.25MHz VccMax= 40V VccMin= 4.5V	1
2.	C1_S2	Generic	Ideal	Cap= 1.0 nF Tolerance= 5.0 %	1
3.	C2_S2	Generic	Ideal	Cap= 39.0 nF Tolerance= 5.0 %	1
4.	R1_S2	Generic	Ideal	Res= 1330.0ohm Tolerance= 1%	1
5.	R2_S2	Generic	Ideal	Res= 1330.0ohm Tolerance= 1%	1
6.	R3_S2	Generic	Ideal	Res= 909.0ohm Tolerance= 1%	1

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