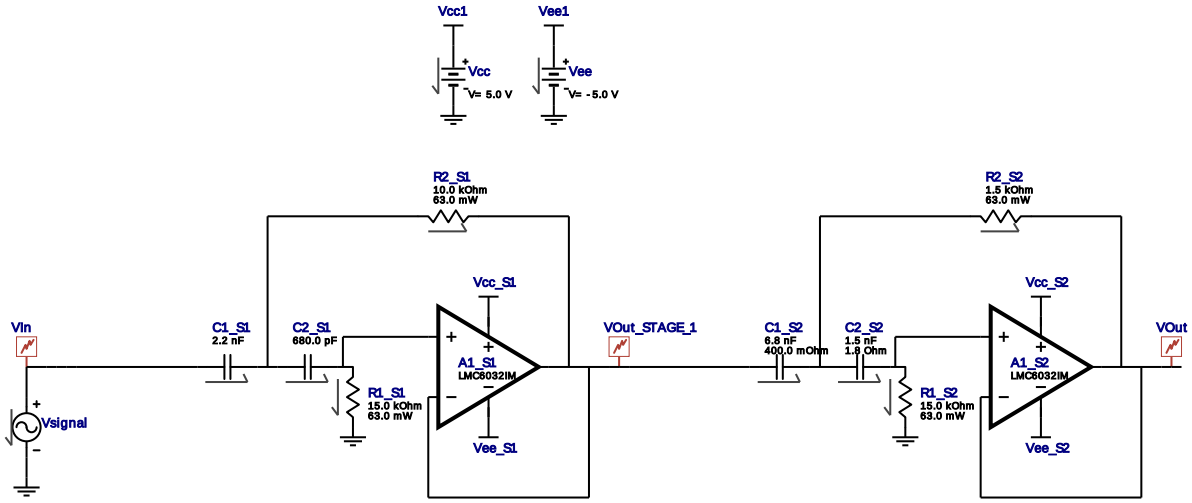
WEBENCH® Electrical Simulation Report

Type : Highpass
Response : Butterworth
Topology : Sallen_Key
Order : 4
Stage Qty : 2

Device = LMC6032IM
Topology = Custom HP Filter
Created = Jun 02 2015 8:22AM
User ID = 4340622
Design Id = 12
eSim Id = 1
Simulation Type = Closed Loop Freq Response

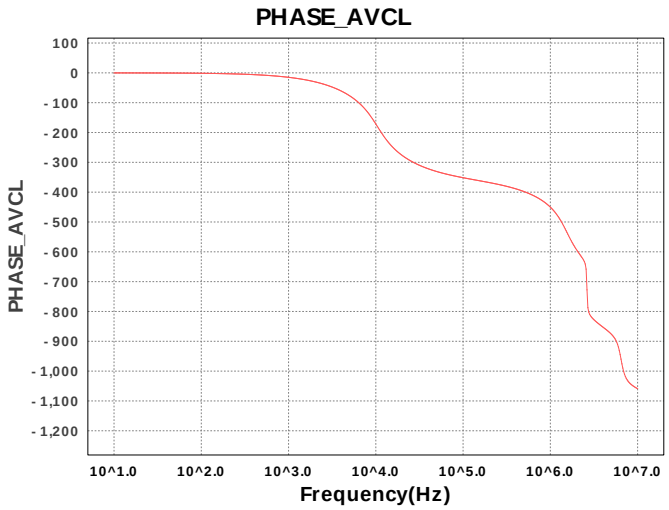


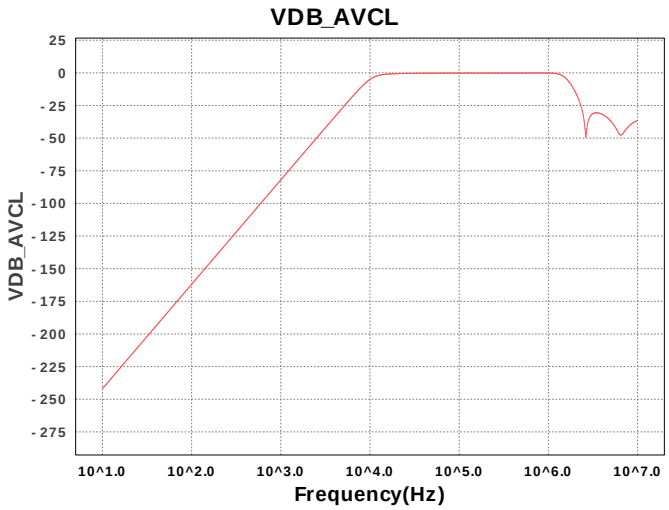
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	LMC6032IM	GbwTyp= 1.4 MHz VccMin= 4.75 V VccMax= 15.5 V	1	$0.32	SOIC 0 mm²
2.	A1_S2	Texas Instruments	LMC6032IM	GbwTyp= 1.4 MHz VccMin= 4.75 V VccMax= 15.5 V	1	$0.32	SOIC 0 mm²
3.	C1_S1	MuRata	GRM155R70J222KA01D Series= X7R	Cap= 2.2 nF VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm²
4.	C1_S2	MuRata	GRM188R71E682KA01D Series= X7R	Cap= 6.8 nF ESR= 400.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
5.	C2_S1	Samsung Electro-Mechanics	CL10C681JA8NNNC Series= C0G/NP0	Cap= 680.0 pF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
6.	C2_S2	MuRata	GRM188R71E152KA01D Series= X7R	Cap= 1.5 nF ESR= 1.8 Ohm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
7.	R1_S1	Vishay-Dale	CRCW040215K0JNED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²
8.	R1_S2	Vishay-Dale	CRCW040215K0JNED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²
9.	R2_S1	Vishay-Dale	CRCW040210K0JNED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²
10.	R2_S2	Vishay-Dale	CRCW04021K50JNED Series= CRCW..e3	Res= 1.5 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Vsignal	AC	AC Voltage Source Amplitude	1 V
		DC	AC Voltage Source DC Offset	0.0 V
2.	Vcc	V	Vcc Supply Rail Value	5.0 V
3.	Vee	V	Vee Supply Rail Value	-5.0 V





Design Inputs

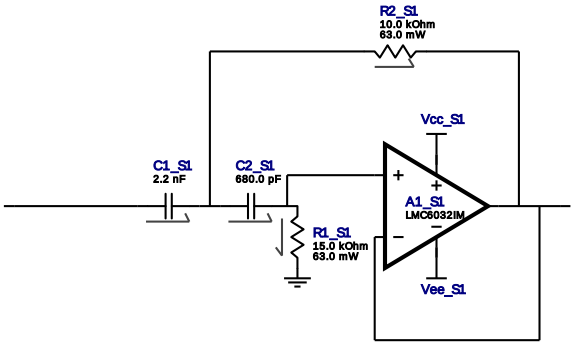
#	Name	Value	Description
1.	FilterType	Highpass	
2.	FilterResponse	Butterworth	
3.	FilterOrder	4.0	
4.	FilterTopology	Sallen_Key	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	10.0 kHz	
7.	StopbandAttenuation	-45.0 dB	
8.	StopbandFrequency	2.0 kHz	
9.	Gain	1.0 V/V	
10.	DualSupply	+/-5.0 V	Power supply(s) to active chips
11.	ResistorTolerance	E6	Resistor series - 20% Passive resistor tolerance
12.	CapacitorTolerance	E6	Capacitor series - 20% Passive capacitance tolerance
13.	SeedCapacitance	1.0 nF	Seed Capacitance to start design of filter

Design Assistance

1. **LMC6032IM** Product Folder : http://www.ti.com//product/LMC6032 : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency	10.0 kHz
Min GBW Reqd	540.0 kHz
Stage Gain	1.0 V/V
Stage Q	540.0 m
Stage Topology	Sallen_Key



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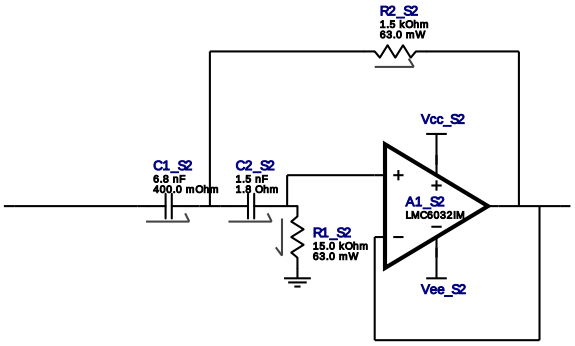
3.	C2_S1	Samsung Electro-Mechanics	CL10C681JA8NNNC Series= C0G/NP0	Cap= 680.0 pF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm^2
4.	R1_S1	Vishay-Dale	CRCW040215K0JNED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm^2
5.	R2_S1	Vishay-Dale	CRCW040210K0JNED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm^2

Filter Stage :2

Cutoff Frequency	10.0 kHz
Min GBW Reqd	1.31 MHz
Stage Gain	1.0 V/V
Stage Q	1.31
Stage Topology	Sallen_Key



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S2	Texas Instruments	LMC6032IM	GbwTyp= 1.4 MHz VccMin= 4.75 V VccMax= 15.5 V	1	$0.32	SOIC 0 mm²
2.	C1_S2	MuRata	GRM188R71E682KA01D Series= X7R	Cap= 6.8 nF ESR= 400.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
3.	C2_S2	MuRata	GRM188R71E152KA01D Series= X7R	Cap= 1.5 nF ESR= 1.8 Ohm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
4.	R1_S2	Vishay-Dale	CRCW040215K0JNED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²
5.	R2_S2	Vishay-Dale	CRCW04021K50JNED Series= CRCW..e3	Res= 1.5 kOhm Power= 63.0 mW Tolerance= 5.0%	1	$0.01	0402 3 mm²