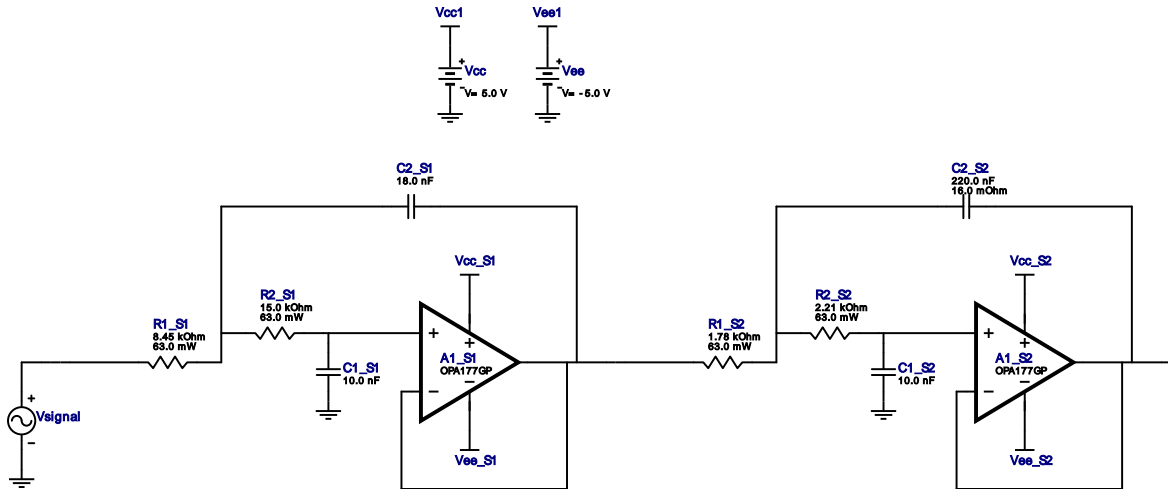


WEBENCH[®] Design Report

 Design : 3728462/9 OPA177GP
 Lowpass, Sallen Key, Chebyshev 0.2 dB


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	OPA177GP	GbwTyp= 400.0 mMHz VccMin= 6.0 V VccMax= 36.0 V	1	\$1.00	DIP 0 mm ²
2.	A1_S2	Texas Instruments	OPA177GP	GbwTyp= 400.0 mMHz VccMin= 6.0 V VccMax= 36.0 V	1	\$1.00	DIP 0 mm ²
3.	C1_S1	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
4.	C1_S2	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
5.	C2_S1	MuRata	GRM21B5C1H183JA01L Series= C0G/NP0	Cap= 18.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.08	0805 7 mm ²
6.	C2_S2	AVX	0805YC222JAT2A Series= X7R	Cap= 220.0 nF ESR= 16.0 mOhm VDC= 16.0 V Tolerance= 5.0 %	1	\$0.11	0805 7 mm ²
7.	R1_S1	Vishay-Dale	CRCW04028K45FKED Series= CRCW..e3	Res= 8.45 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
8.	R1_S2	Vishay-Dale	CRCW04021K78FKED Series= CRCW..e3	Res= 1.78 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	R2_S1	Vishay-Dale	CRCW040215K0FKED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	R2_S2	Vishay-Dale	CRCW04022K21FKED Series= CRCW..e3	Res= 2.21 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

Design Inputs

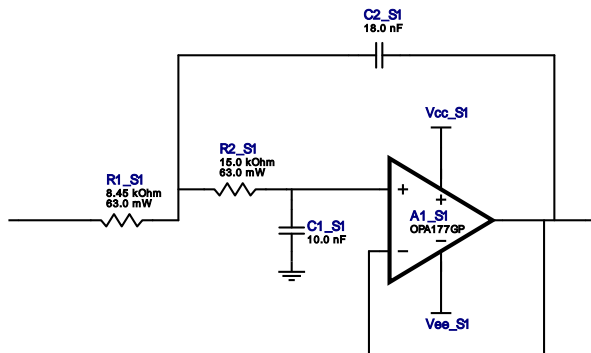
#	Name	Value	Description
1.	FilterType	Lowpass	
2.	FilterResponse	Chebyshev	
3.	FilterOrder	4.0	
4.	FilterTopology	Sallen_Key	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	1.5 k	
7.	StopbandAttenuation	-45.0	
8.	StopbandFrequency	5.0 k	
9.	Gain	1.0	
10.	DualSupply	+/-5.0 V	Power supply(s) to active chips
11.	ResistorTolerance	E96	Resistor series - 1% Passive resistor tolerance
12.	CapacitorTolerance	E24	Capacitor series - 5% Passive capacitance tolerance
13.	SeedCapacitance	10.0 n	Seed Capacitance to start design of filter

Design Assistance

1. **OPA177GP** Product Folder : <http://www.ti.com//product/OPA177> : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency 1.052 kHz
 Min GBW Req'd 67.937 kHz
 Stage Gain 1.0 V/V
 Stage Q 646.0 m
 Stage Topology Sallen_Key

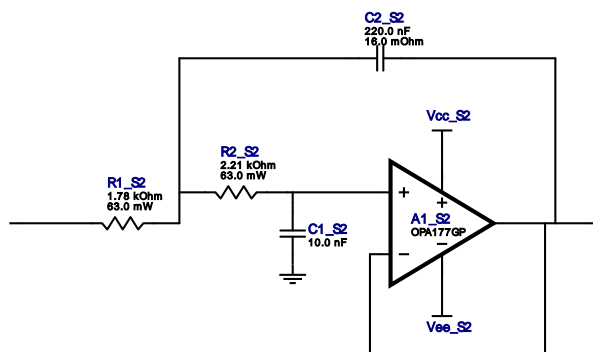


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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2.	C1_S1	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
3.	C2_S1	MuRata	GRM21B5C1H183JA01L Series= C0G/NP0	Cap= 18.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.08	0805 7 mm ²
4.	R1_S1	Vishay-Dale	CRCW04028K45FKED Series= CRCW..e3	Res= 8.45 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	R2_S1	Vishay-Dale	CRCW040215K0FKED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

Filter Stage :2

Cutoff Frequency	1.642 kHz
Min GBW Req'd	399.888 kHz
Stage Gain	1.0 V/V
Stage Q	2.435
Stage Topology	Sallen_Key



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S2	Texas Instruments	OPA177GP	GbwTyp= 400.0 mMHz VccMin= 6.0 V VccMax= 36.0 V	1	\$1.00	DIP 0 mm ²
2.	C1_S2	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
3.	C2_S2	AVX	0805YC224JAT2A Series= X7R	Cap= 220.0 nF ESR= 16.0 mOhm VDC= 16.0 V Tolerance= 5.0 %	1	\$0.11	0805 7 mm ²
4.	R1_S2	Vishay-Dale	CRCW04021K78FKED Series= CRCW..e3	Res= 1.78 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	R2_S2	Vishay-Dale	CRCW04022K21FKED Series= CRCW..e3	Res= 2.21 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

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