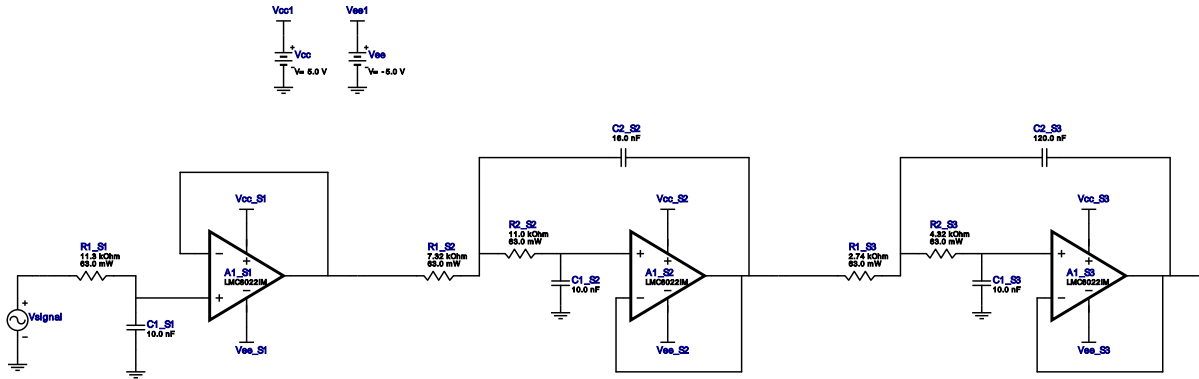



WEBENCH[®] Design Report

 Design : 3728462/5 LMC6022IM
 Lowpass, Sallen Key, Butterworth

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 0 mm ²
2.	A1_S2	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 0 mm ²
3.	A1_S3	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 0 mm ²
4.	C1_S1	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
5.	C1_S2	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
6.	C1_S3	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
7.	C2_S2	MuRata	GRM55N5C1H163JD01L Series= C0G/NP0	Cap= 16.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$1.26	 2220 54 mm ²
8.	C2_S3	Kemet	C1812C124J5GACTU Series= C0G/NP0	Cap= 120.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.73	 1812 23 mm ²
9.	R1_S1	Vishay-Dale	CRCW040211K3FKED Series= CRCW..e3	Res= 11.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	R1_S2	Vishay-Dale	CRCW04027K32FKED Series= CRCW..e3	Res= 7.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	R1_S3	Vishay-Dale	CRCW04022K74FKED Series= CRCW..e3	Res= 2.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	R2_S2	Vishay-Dale	CRCW040211K0FKED Series= CRCW..e3	Res= 11.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
13.	R2_S3	Vishay-Dale	CRCW04024K32FKED Series= CRCW..e3	Res= 4.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

Design Inputs

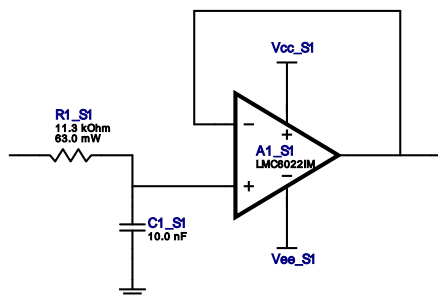
#	Name	Value	Description
1.	FilterType	Lowpass	
2.	FilterResponse	Butterworth	
3.	FilterOrder	5.0	
4.	FilterTopology	Sallen_Key	
5.	NumberOfStages	3.0	
6.	PassbandFrequency	1.4 k	
7.	StopbandAttenuation	-45.0	
8.	StopbandFrequency	5.0 k	
9.	Gain	1.0	
10.	DualSupply	+/-5.0 V	Power supply(s) to active 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. **LMC6022IM** Product Folder : <http://www.ti.com/product/LMC6022> : contains the data sheet and other resources.

Filter Stage :1

Cutoff Frequency 1.4 kHz
 Min GBW Req'd 70.0 kHz
 Stage Gain 1.0 V/V
 Stage Q 500.0 m
 Stage Topology Real_Pole

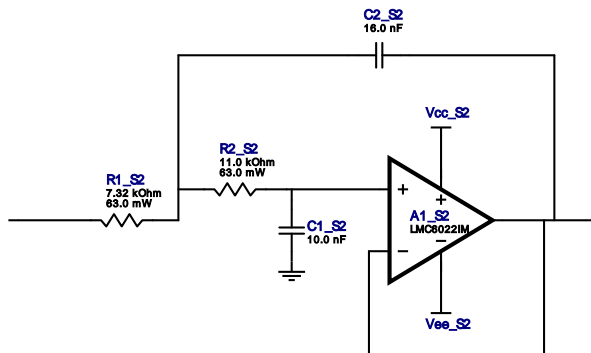


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mMHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 0 mm ²
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.	R1_S1	Vishay-Dale	CRCW040211K3FKED Series= CRCW..e3	Res= 11.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

Filter Stage :2

Cutoff Frequency 1.4 kHz
 Min GBW Req'd 86.8 kHz
 Stage Gain 1.0 V/V
 Stage Q 620.0 m
 Stage Topology Sallen_Key

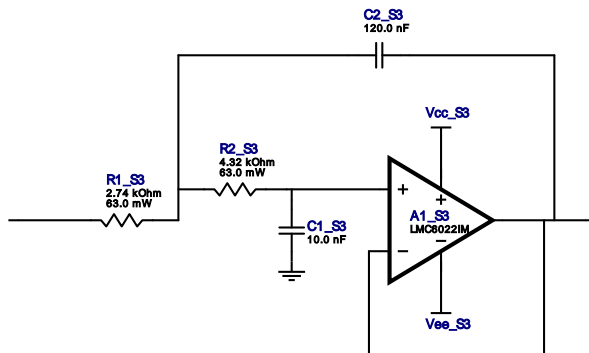


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S2	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mMHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 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	MuRata	GRM55N5C1H163JD01L Series= C0G/NP0	Cap= 16.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$1.26	2220 54 mm ²
4.	R1_S2	Vishay-Dale	CRCW04027K32FKED Series= CRCW..e3	Res= 7.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	R2_S2	Vishay-Dale	CRCW040211K0FKED Series= CRCW..e3	Res= 11.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

Filter Stage :3

Cutoff Frequency	1.4 kHz
Min GBW Req'd	226.8 kHz
Stage Gain	1.0 V/V
Stage Q	1.62
Stage Topology	Sallen_Key



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S3	Texas Instruments	LMC6022IM	GbwTyp= 350.0 mMHz VccMin= 4.75 V VccMax= 15.5 V	1	\$0.55	SOIC 0 mm ²
2.	C1_S3	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.01	0603 5 mm ²
3.	C2_S3	Kemet	C1812C124J5GACTU Series= C0G/NP0	Cap= 120.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.73	1812 23 mm ²
4.	R1_S3	Vishay-Dale	CRCW04022K74FKED Series= CRCW..e3	Res= 2.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	R2_S3	Vishay-Dale	CRCW04024K32FKED Series= CRCW..e3	Res= 4.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

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