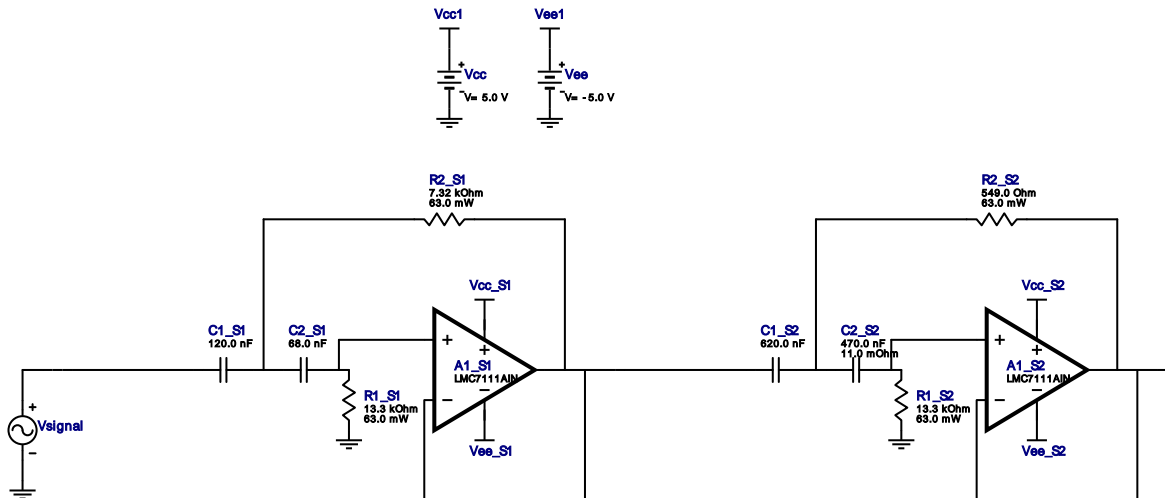









## WEBENCH® Design Report

 Design : 3989908/18 LMC7111AIN  
 Highpass, Sallen Key, Chebyshev 0.2 dB


### Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	LMC7111AIN	GbwTyp= 50.0 mMHz VccMin= 2.7 V VccMax= 11.0 V	1	\$0.55	DIP 0 mm <sup>2</sup>
2.	A1_S2	Texas Instruments	LMC7111AIN	GbwTyp= 50.0 mMHz VccMin= 2.7 V VccMax= 11.0 V	1	\$0.55	DIP 0 mm <sup>2</sup>
3.	C1_S1	Kemet	C1812C124J5GACTU Series= C0G/NP0	Cap= 120.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.73	 1812 23 mm <sup>2</sup>
4.	C1_S2	CUSTOM	CUSTOM Series= ?	Cap= 620.0 nF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
5.	C2_S1	AVX	12063A682JAT2A Series= C0G/NP0	Cap= 68.0 nF VDC= 25.0 V Tolerance= 5.0 %	1	\$0.14	 1206 11 mm <sup>2</sup>
6.	C2_S2	AVX	0805YC474JAT2A Series= X7R	Cap= 470.0 nF ESR= 11.0 mOhm VDC= 16.0 V Tolerance= 5.0 %	1	\$0.12	 0805 7 mm <sup>2</sup>
7.	R1_S1	Vishay-Dale	CRCW040213K3FKED Series= CRCW..e3	Res= 13.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
8.	R1_S2	Vishay-Dale	CRCW040213K3FKED Series= CRCW..e3	Res= 13.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
9.	R2_S1	Vishay-Dale	CRCW04027K32FKED Series= CRCW..e3	Res= 7.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
10.	R2_S2	Vishay-Dale	CRCW0402549RFKED Series= CRCW..e3	Res= 549.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

### Design Inputs

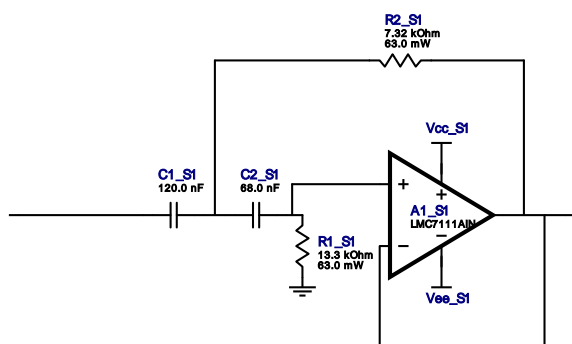
#	Name	Value	Description
1.	FilterType	Highpass	
2.	FilterResponse	Chebyshev	
3.	FilterOrder	4.0	
4.	FilterTopology	Sallen_Key	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	120.0	
7.	StopbandAttenuation	-20.0	
8.	StopbandFrequency	60.0	
9.	Gain	1.0	
10.	DualSupply	+/-5.0 V	Power supply(s) to active chips
11.	ResistorTolerance	E96	Resistor series - 1% Passive resistor tolerance
12.	CapacitorTolerance	E24	Capacitor series - 5% Passive capacitance tolerance
13.	SeedCapacitance	100.0 n	Seed Capacitance to start design of filter

## Design Assistance





1. **LMC7111AIN** Product Folder : <http://www.ti.com//product/LMC7111> : contains the data sheet and other resources.

## Filter Stage :1

Cutoff Frequency 171.157 Hz  
 Min GBW Req'd 11.057 kHz  
 Stage Gain 1.0 V/V  
 Stage Q 646.0 m  
 Stage Topology Sallen\_Key

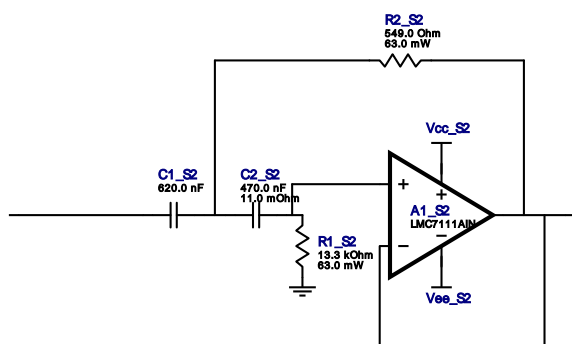


## Electrical BOM




#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	LMC7111AIN	GbwTyp= 50.0 mMHz VccMin= 2.7 V VccMax= 11.0 V	1	\$0.55	DIP 0 mm <sup>2</sup>
2.	C1_S1	Kemet	C1812C124J5GACTU Series= C0G/NP0	Cap= 120.0 nF VDC= 50.0 V Tolerance= 5.0 %	1	\$0.73	 1812 23 mm <sup>2</sup>
3.	C2_S1	AVX	12063A682JAT2A Series= C0G/NP0	Cap= 68.0 nF VDC= 25.0 V Tolerance= 5.0 %	1	\$0.14	 1206 11 mm <sup>2</sup>
4.	R1_S1	Vishay-Dale	CRCW040213K3FKED Series= CRCW..e3	Res= 13.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
5.	R2_S1	Vishay-Dale	CRCW04027K32FKED Series= CRCW..e3	Res= 7.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

## Filter Stage :2

Cutoff Frequency	109.606 Hz
Min GBW Req'd	26.689 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	LMC7111AIN	GbwTyp= 50.0 mMHz VccMin= 2.7 V VccMax= 11.0 V	1	\$0.55	DIP 0 mm <sup>2</sup>
2.	C1_S2	CUSTOM	CUSTOM Series= ?	Cap= 620.0 nF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
3.	C2_S2	AVX	0805YC474JAT2A Series= X7R	Cap= 470.0 nF ESR= 11.0 mOhm VDC= 16.0 V Tolerance= 5.0 %	1	\$0.12	 0805 7 mm <sup>2</sup>
4.	R1_S2	Vishay-Dale	CRCW040213K3FKED Series= CRCW..e3	Res= 13.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
5.	R2_S2	Vishay-Dale	CRCW0402549RFKED Series= CRCW..e3	Res= 549.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).