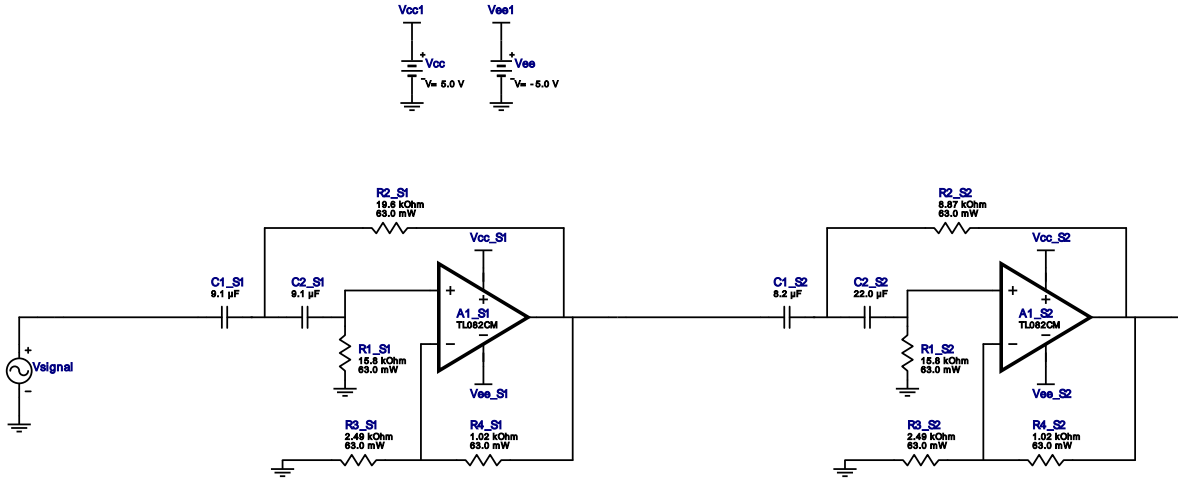


**WEBENCH<sup>®</sup> Design Report**

 Design : 3989908/17 TL082CM  
 Highpass, Sallen Key, Butterworth

**Electrical BOM**

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	TL082CM	GbwTyp= 4.0 MHz VccMin= 10.0 V VccMax= 36.0 V	1	\$0.21	SOIC 0 mm <sup>2</sup>
2.	A1_S2	Texas Instruments	TL082CM	GbwTyp= 4.0 MHz VccMin= 10.0 V VccMax= 36.0 V	1	\$0.21	SOIC 0 mm <sup>2</sup>
3.	C1_S1	CUSTOM	CUSTOM Series= ?	Cap= 9.1 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
4.	C1_S2	CUSTOM	CUSTOM Series= ?	Cap= 8.2 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
5.	C2_S1	CUSTOM	CUSTOM Series= ?	Cap= 9.1 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
6.	C2_S2	CUSTOM	CUSTOM Series= ?	Cap= 22.0 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
7.	R1_S1	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
8.	R1_S2	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
9.	R2_S1	Vishay-Dale	CRCW040219K6FKED Series= CRCW..e3	Res= 19.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
10.	R2_S2	Vishay-Dale	CRCW04028K87FKED Series= CRCW..e3	Res= 8.87 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
11.	R3_S1	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	R3_S2	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
13.	R4_S1	Vishay-Dale	CRCW04021K02FKED Series= CRCW..e3	Res= 1.02 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
14.	R4_S2	Vishay-Dale	CRCW04021K02FKED Series= CRCW..e3	Res= 1.02 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

## Design Inputs

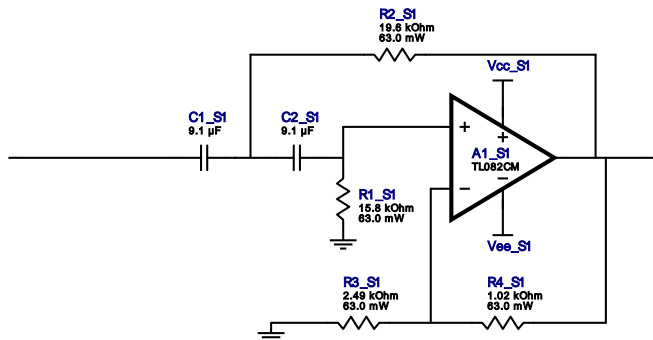
#	Name	Value	Description
1.	FilterType	Highpass	
2.	FilterResponse	Butterworth	
3.	FilterOrder	4.0	
4.	FilterTopology	Sallen_Key	
5.	NumberOfStages	2.0	
6.	PassbandFrequency	1.0	
7.	StopbandAttenuation	-20.0	
8.	StopbandFrequency	500.0 m	
9.	Gain	2.0	
10.	DualSupply	+/-5.0 V	Power supply(s) to active chips
11.	ResistorTolerance	E96	Resistor series - 1% Passive resistor tolerance
12.	CapacitorTolerance	E24	Capacitor series - 5% Passive capacitance tolerance
13.	SeedCapacitance	10.0 µ	Seed Capacitance to start design of filter

## Design Assistance

1. **TL082CM** Product Folder : <http://www.ti.com/product/TL082-N> : contains the data sheet and other resources.

## Filter Stage :1

Cutoff Frequency	1.0 Hz
Min GBW Req'd	76.356 Hz
Stage Gain	1.414 V/V
Stage Q	540.0 m
Stage Topology	Sallen_Key

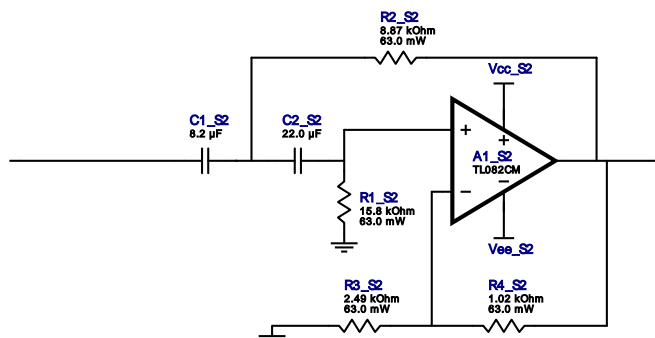


## Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	A1_S1	Texas Instruments	TL082CM	GbwTyp= 4.0 MHz VccMin= 10.0 V VccMax= 36.0 V	1	\$0.21	SOIC 0 mm <sup>2</sup>
2.	C1_S1	CUSTOM	CUSTOM Series= ?	Cap= 9.1 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
3.	C2_S1	CUSTOM	CUSTOM Series= ?	Cap= 9.1 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
4.	R1_S1	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
5.	R2_S1	Vishay-Dale	CRCW040219K6FKED Series= CRCW..e3	Res= 19.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
6.	R3_S1	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
7.	R4_S1	Vishay-Dale	CRCW04021K02FKED Series= CRCW..e3	Res= 1.02 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

## Filter Stage :2

Cutoff Frequency	1.0 Hz
Min GBW Req'd	185.234 Hz
Stage Gain	1.414 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	TL082CM	GbwTyp= 4.0 MHz VccMin= 10.0 V VccMax= 36.0 V	1	\$0.21	SOIC 0 mm <sup>2</sup>
2.	C1_S2	CUSTOM	CUSTOM Series= ?	Cap= 8.2 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
3.	C2_S2	CUSTOM	CUSTOM Series= ?	Cap= 22.0 uF VDC= 0.0 V Tolerance= 0.0 %	1	NA	CUSTOM 0 mm <sup>2</sup>
4.	R1_S2	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
5.	R2_S2	Vishay-Dale	CRCW04028K87FKED Series= CRCW..e3	Res= 8.87 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
6.	R3_S2	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	R4_S2	Vishay-Dale	CRCW04021K02FKED Series= CRCW..e3	Res= 1.02 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

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