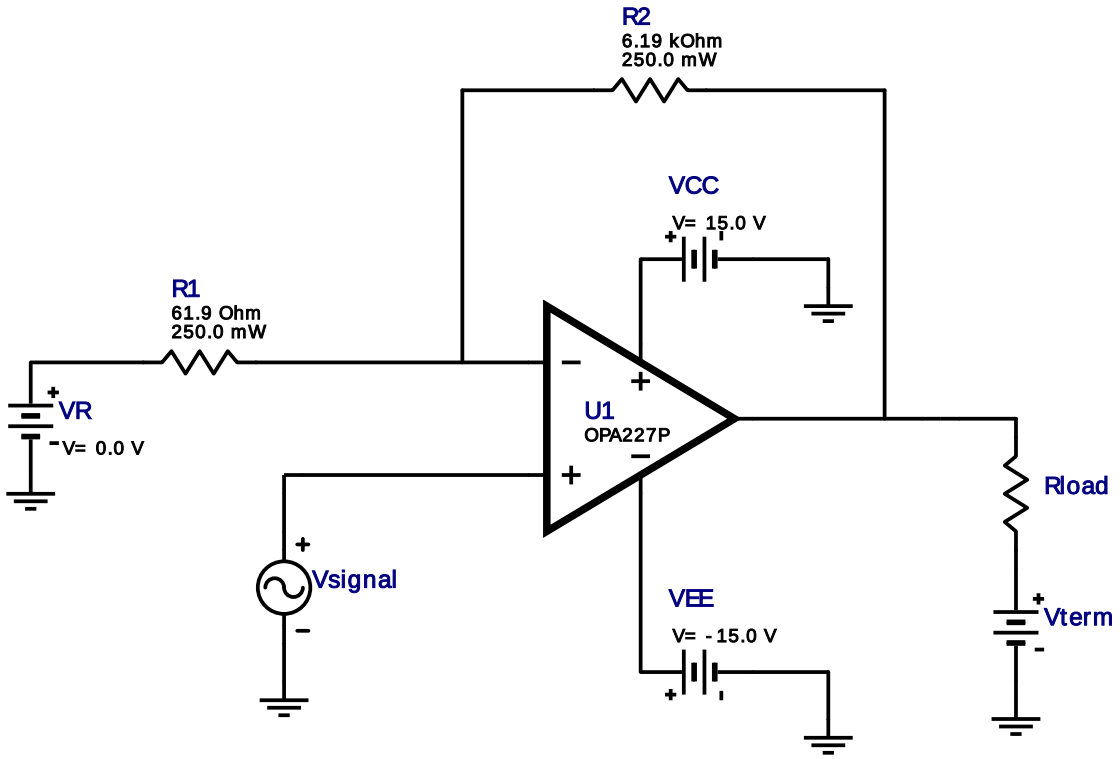
Device = OPA227P
Topology = Non-inverting
Created = Aug 02 2016 7:41PM
BOM Cost = $3.08
Footprint = 137.4 mm^2
BOM Count = 3

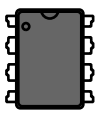
WEBENCH® Amplifier Design Report

Design : 4446210/42 OPA227P
Your OPA227P Non-inverting Amp Design



My Comments
No comments

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	R1	Panasonic	ERJ-8ENF61R9V Series= ERJ-8E	Res= 61.9 Ohm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm^2
2.	R2	Panasonic	ERJ-8ENF6191V Series= ERJ-8E	Res= 6.19 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm^2
3.	U1	Texas Instruments, Inc.	OPA227P	GbwTyp= 8.0 MHz VccMin= 5.0 V VccMax= 36.0 V	1	$3.06	 P0008A 116 mm^2

Design Inputs

#	Name	Value	Description
1.	Topology	Non-inverting	
2.	ClosedLoopGain	100.0 V/V	System Gain
3.	SmallSignalClosedLoopBandwidth	10000.0 Hz	Circuit Bandwidth
4.	DualSupply	true	Power supply(s) to active chips
5.	PositiveSupplyVoltage	15.0 V	
6.	PositiveSupplyTolerance	5.0 %	
7.	NegativeSupplyVoltage	-15.0 V	
8.	NegativeSupplyTolerance	5.0 %	
9.	VinMin	0.0 V	Minimum input voltage

#	Name	Value	Description
10.	VinMax	0.01 V	Maximum input voltage
11.	VinPkPk	0.01 V	Peak to peak input voltage (VinMax – VinMin)
12.	VinMidpointVoltage	0.005 V	Midpoint of input voltage ((VinMax – VinMin)/2 + VinMin)
13.	VoutMin	0.0 V	Minimum output voltage
14.	VoutMax	1.0 V	Maximum output voltage
15.	VoutPkPk	1.0 V	Peak to peak input voltage (VoutMax – VoutMin)
16.	VoutMidpointVoltage	0.5 V	Midpoint of input voltage ((VoutMax – VoutMin)/2 + VoutMin)
17.	VRefRecommended	0.0 V	Recommended WEBENCH Voltage Reference Value
18.	VRefUserSpec	0.0 V	User override of Voltage Reference Value
19.	TempMin	0.0 degC	Minimum Specified Temperature
20.	TempMax	70.0 degC	Maximum Specified Temperature

Performance Values - Design Criteria

#	Name	Value	Description
1.	Vcc	15.0 V	Positive Power Supply
2.	Vee	-15.0 V	Negative Power Supply
3.	Op Amp	OPA227P	Circuit's Operational Amplifier
4.	Gain	100.0 V/V	Signal Gain
5.	Vin Min	0.0 V	Input minimum voltage
6.	Vin Max	10.0 mV	Input maximum voltage
7.	Vin pk-pk	10.0 mV	Input peak-to-peak voltage
8.	Vin Midpoint	5.0 mV	Input midpoint voltage
9.	Vout Min	0.0 V	Output minimum voltage
10.	Vout Max	1.0 V	Output maximum voltage
11.	Vout pk-pk	1.0 V	Output peak-to-peak voltage
12.	Vout Midpoint	500.0 mV	Output midpoint voltage
13.	Voltage Reference	0.0 V	Voltage reference
14.	R1	61.881 Ohms	Gain resistor
15.	R1 Tolerance		Gain resistor tolerance
16.	R2	6.126 kOhms	Feedback resistor
17.	R2 Tolerance		Feedback resistor tolerance
18.	SS Bandwidth	10.0 kHz	Small Signal Bandwidth
19.	Temp Minimum	0.0 degC	Minimum circuit temperature
20.	Temp Maximum	70.0 degC	Maximum circuit temperature
21.	R1	61.9 Ohms	Gain resistor
22.	R1 Tolerance	1.0 %	Gain resistor tolerance
23.	R2	6.19 kOhms	Feedback resistor
24.	R2 Tolerance	1.0 %	Feedback resistor tolerance
25.	SS Bandwidth	79.208 kHz	Small Signal Bandwidth

Performance Values - Actual Design

#	Name	Value	Description
1.	Vcc	15.0 V	Positive Power Supply
2.	Vee	-15.0 V	Negative Power Supply
3.	Op Amp	OPA227P	Actual Circuit operational amplifier
4.	Gain_target	101.0 V/V	Signal gain with actual resistors
5.	Vin Min	0.0 V	Input minimum voltage
6.	Vin Max	10.0 mV	Input maximum voltage
7.	Vin pk-pk	10.0 mV	Input peak-to-peak voltage
8.	Vin Midpoint	5.0 mV	Input midpoint voltage
9.	Vout Min	0.0 V	Actual Output minimum voltage
10.	Vout Max	1.01 V	Actual Output maximum voltage
11.	Vout pk-pk	1.01 V	Actual Output peak-to-peak voltage
12.	Vout Midpoint	505.0 mV	Actual Output midpoint voltage
13.	Voltage Reference	0.0 V	Actual Voltage reference
14.	Temp Minimum	0.0 degC	Minimum circuit temperature
15.	Temp Maximum	70.0 degC	Maximum circuit temperature

Performance Values - Operating Frequency Values

#	Name	Value	Description
1.	Amplifier GBWP	8.0 MHz	Amplifier Gain Bandwidth Product
2.	Amplifier Slew Rate	2.3 V/usec	Amplifier Slew Rate
3.	Closed Loop Bandwidth	79.208 mMHz	System Bandwidth
4.	FPBW	12.202 mKHz	Circuit Full-power Bandwidth

Performance Values - Power Requirements

#	Name	Value	Description
1.	Vcc	15.0 V	Positive nominal power supply
2.	Vee	-15.0 V	Negative nominal power supply
3.	Vsupply Max	36.0 V	Operational amplifier maximum power supply range
4.	Vsupply Min	5.0 V	Operational amplifier minumum power supply range

#	Name	Value	Description
5.	Power IC	111.0 mW	Operational amplifier nominal power dissipation

Performance Values - Vos / Ib Vout error

#	Name	Value	Description
1.	Vout Vos(max) error	7.575 mV	25 deg C maximimum offset voltage error at the output
2.	Vout Ib(max) error	0.0 mV	25 deg C maximimum input bias current error at the output
3.	Tot error RSS	7.575 mV	Root sum square of output offset errors
4.	Tot error Worst Case	7.575 mV	Sum of output offset errors

Performance Values - Vout Gain vs. Resistor Tolerance

No calculated performance values for this design.

Performance Values - Error Over Temperature

#	Name	Value	Description
1.	Vos at maximum temperature	959.5 mmV	Maximum amplifer offset voltage drift error at high temperature
2.	Vos at minimum temperature	757.5 mmV	Maximum amplifier offset voltage drift error at low temperautre

Performance Values - Total Output Noise

#	Name	Value	Description
1.	Noise (rms)	112.014 uVrms	Total output rms noise error
2.	Noise (p-p)	739.292 uVp-p	Total peak-to-peak output noise (3 sigma)
3.	SNR	69.98 dB	Operational amplifier output Signal to Noise ratio

Design Assistance

1. OPA227 Product Folder : http://www.ti.com//product/OPA227 : contains the data sheet and other resources.