



E7402

Op-Amp Swap Guide

Hi-Fi USB DAC (Digital-to-Analog Converter)

Essence Series & Xense

First Edition

May 2012

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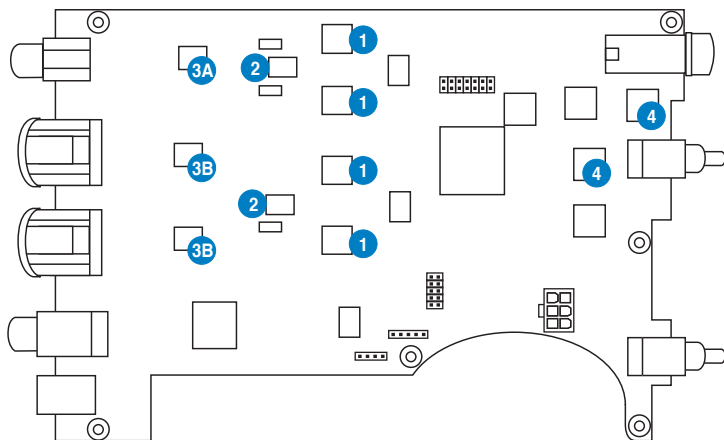
An operational amplifier (Op-Amp) plays an important role in audio performance and tonal style by creating distinct listening experiences. Catering to the needs of audiophiles, Essence series and Xonar Xense streamline Op-Amp modifications with easily-swappable Op-Amp sockets.

1. Swap Guide

1.1 Essence One



Change all the Op-Amps of the same types in the same slot. For example, if you need to change DAC I/V (slot 1), you would need to change all the Op-Amps of the same types in all slot 1. If you need to change DAC buffer (slot 2), you need to change the Op-Amps of the same types in all slot 2.



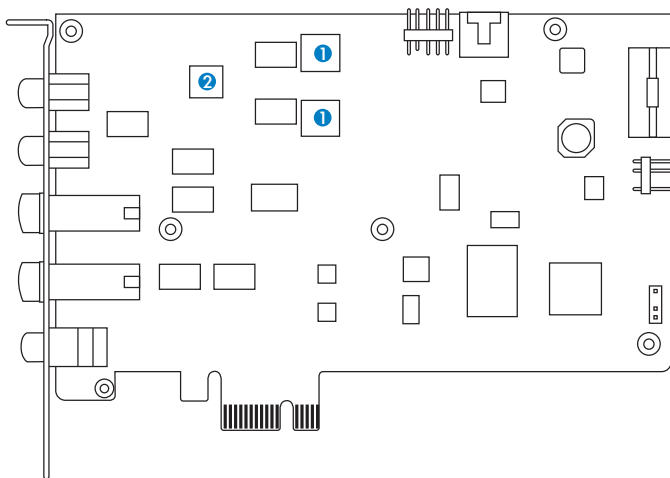
1. Serves as I/V (current to voltage convertor) that turns current from DAC into voltage for output purpose. Changing this will affect all outputs (including Headphone output, RCA output and XLR output).
2. Serves as Low Pass Filter that filters background noises. Changing this will affect all outputs (including Headphone output, RCA output and XLR output).
- 3A. Serves as buffer that enhances the output signal for the speaker. Changing this will affect the RCA output.
- 3B. Serves as buffer that enhances the output signal for the speaker. Changing this will affect the XLR output
4. Serves as buffer that enhances the output signal for the headphone. Changing this will affect the headphone output.

	All outputs (Headphone output, RCA output, XLR output)	Headphone output	RCA output	XLR output
1	✓			
2	✓			
3A			✓	
3B				✓
4		✓		

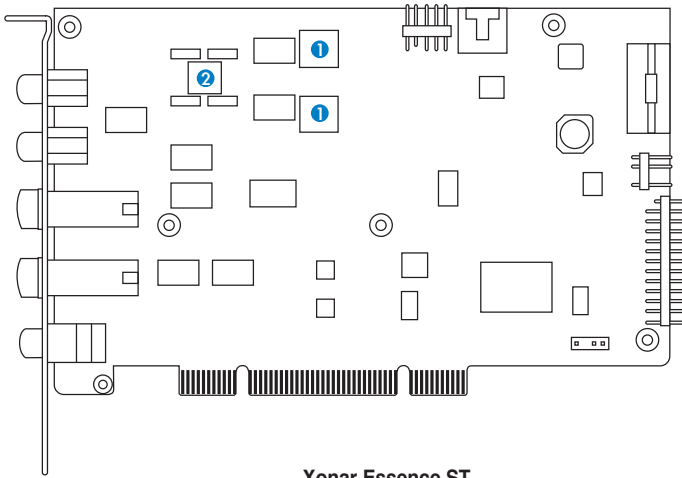
1.2 Essence Series and Xonar Xense



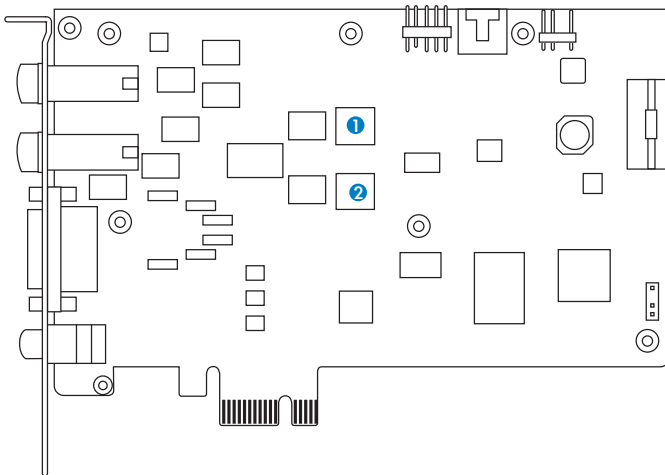
Before you start swapping, ensure that you have removed the EMI shield and unplugged the power cord that connects to the Xonar Xense or Essence ST/STX.



Xonar Essence STX



Xonar Essence ST



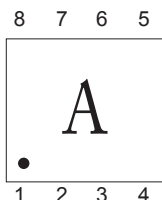
Xonar Xense

1. Serves as I/V (current to voltage convertor) that turns current from DAC into voltage for output purpose. Changing this will affect the tonal quality for all outputs (including both RCA and 1/4" Headphone output).
2. Serves as buffer that enhances output signal for speaker. Changing this will affect the tonal quality of RCA outputs.

2. Instructions

2.1 Place down an Op-Amp correctly

To avoid reversion, make sure that Pin 1 is at the lower left corner when the bracket is on your left-hand side. Pick up Op-Amp with an IC clamp vertically upward to avoid bending.

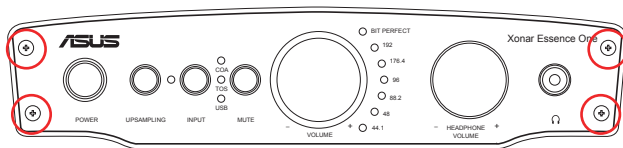


2.2 Disassembly

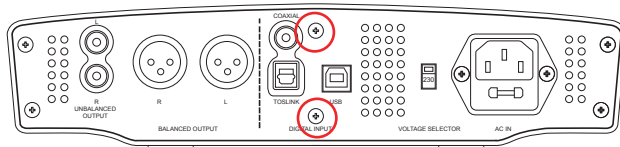
Essence One

1. Loosen the four screws in the front panel and the two screws in the rear panel with a screwdriver.

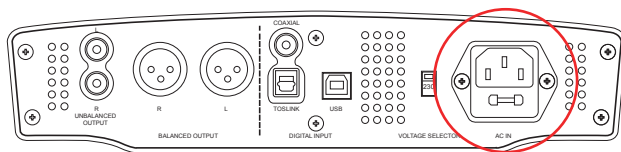
Front Panel



Rear Panel



2. Push the power connector on the rear panel to remove the machine bed (including the PCB board and power module) from the machine housing.



Essence Series and Xonar Xense

1. Loosen the screws with a screwdriver.
2. Remove the EMI shield.

2.3 Swapping Op-Amps

1. Use an IC clamp to clasp an Op-Amp and remove it vertically upwards.
2. Replace it with a new Op-Amp from the Op-Amp kit.

3. Op-Amp Pairing Impression

Recommended Op-Amp Pairing combinations:

Essence One

I/V Slot 1	Buffer Slot 2	Impression
TI – OPA2132	NS – LM4562NA	Brighter, dense bottom end, wider sound stage and articulate with detail, slightly cool
TI – OPA2132	TI – NE5532	Open sound stage, less detailed but with more powerful bass and bottom end sound
TI – NE5532	TI – OPA2132	Less transparent, softer, tighter bottom end
TI – NE5532	NS – LM4562NA	Brighter and more detailed, airy, a little distant and less warm

Essence One - Alternative Pairing

DAC I/V Slot 1	DAC buffer Slot 2	Sound Impression
TI – OPA2107	TI – OPA2132	Sweet and articulate, brighter vocal, slightly less bottom end sound
TI – OPA2107	NS – LME49860	Detailed and delicate, with less but tighter bottom sound
NS – LME49720	NS – LM4562NA	Cool, more extensive detailed and dampened mid-range, smooth, Essence ST/STX style
NS – LM4562NA	NS – LM4562NA	Wider sound stage but less detailed than the above combination
NS – LM4562NA	NJRC – MUSE02	Powerful, punchy sound with good sound stage and richness, less resolution but good dynamic
NS – LME49720NA	NJRC – MUSE02	Brighter, sweet sound and more detail than the above combination
TI-OPA1232	NS-LME49720NA	Wider sound stage, brighter and more detailed but less body

Essence Series and Xonar Xense

I/V Slot 1	Buffer Slot 2	Impression
NS – LME49720	NS – LM4562NA	Natural sounding, punchy, great sound stage with depth and details

4. Recommended Op-Amp List

Brand	Model name
NS	LME49860
NS	LME49720NA
NS	LM4562NA
TI	OPA2111
TI	OPA2132
TI	OPA2107
ADI	OP275
ADI	AD823
NJRC	MUSE01
NJRC	MUSE02