ASUS ®

Essence One Series

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

User Guide

Contents

Safety Information

For your own safety please read the following important safety instructions carefully before attempting to connect this unit to the mains power supply. They will also enable you to get the best performance from and prolong the life of the unit.

Voltage Selection

The rear panel includes a voltage selection switch with two settings: '115' and '230'. Check to see that it is properly configured for your location before connecting AC power. Actually, the AC input has a very wide input voltage range and can operate over a frequency range of 47.5 to 52.5 or 57 to 63 Hz. At 115, the Essence One Series will operate normally over a range of 95 to 132 VAC. At 230, the Essence One Series will operate normally over a range of 190 to 264 VAC.

> **CAUTION:** Always insure that the voltage setting is correct for your locality. Incorrect configuration may blow fuses or cause erratic operation.
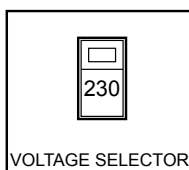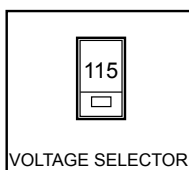
230V   115V

Repairs

Do not service or repair this product unless properly qualified. Only a qualified technician should perform repairs.

Fuses

The fuse holder is built into a drawer next to the IEC power connector.

> **CAUTION:** For continued fire hazard protection always replace the fuses with the correct size and type (1A 250V, 5 x 20 mm).

Use tools to replace the fuses.
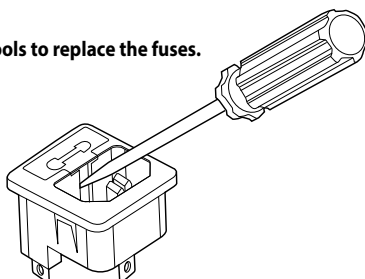
Other Safety Information

1.   Read and keep these instructions for future reference.
2.   Follow all instructions and take note of all warnings.
3.   Do not use this apparatus near water or expose the device to moisture.
4.   Clean machine surface with a cloth. Avoid using detergent or cleaning fluid.
5.   Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
6.   Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
7.   The polarized or grounding-type plug is for user safety. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the outlet.
8.   Protect the power cord from being stepped on or compressed particularly at the point where it exits from the apparatus.
9.   Only use attachments/accessories approved by the manufacturer.
10. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When using a cart, take care to avoid tipping over the load when moving the device.

11. Unplug this apparatus during lightning storms or when not in use for a long period of time.
12. Refer all repairs to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Philosophy

We at ASUS, recognizing that computers and digital devices are the major platforms for audio entertainment, started out with consumer-sound cards in 2007 to build the ASUS brand in the audio industry. This gives our ASUS brand a more stable foundation through gradual growth, making it possible to move into the Hi-Fi/audiophile market.

In 2009, we launched Essence ST/STX, one of our mid-range products that covered a wide variety of applications, from high-end music applications to games. Essence ST/STX was very popular in forums and user communities, leading us to conclude that the time was right for more upscale audiophile products.

We then started work on a prototype which eventually became the Essence One Series, with its greater flexibility, more spacious PCB and higher power delivery – all attributed to Essence One Series being an external device rather than an internal card.

ASUS now has a large team dedicated to designing and engineering audio products. We have been able to expand our audio product range into more diverse categories in recent years, and have met considerable success. In 2010 we partnered with Sennheiser on a headset-soundcard set, which confirmed our level of expertise as partners of one of the world's leading audiophile brands.

Design Story

ASUS has an eclectic group of visionaries and acoustic engineers coming from the art, user experience, and the entertainment industry with a shared passion for music. Knowing that digital media constantly changes and evolves based on our personal experience, the ASUS team constantly evaluates the design segments with different outlook and perspective, striving to provide new and better experience for music lovers and audiophiles.

Being Present

Instead of defining hard-stoned desired results, we believe that sound is about appreciating the present. Top-grade component is just one tiny part of the puzzle that we mold and build to bring you the "essence of sound". Through our meticulous testing and product performance checks, we examine our design rules and layout with excruciating detail because any misstep could lead to a misrepresentation of the originality of sound.

Made for You

Across all our products, you will find that the Essence of Sound is sublime rather than overdominating, composed yet powerful. The Essence series follow the Confucius thinking of "Respect" and "Harmony" – we respect that personal taste for music may vary and hence we've included swappable op-amps for further customization. We recognize that beautiful sound is about being in harmony with the surrounding and the environment. Hence having an independent volume control for audiophiles' smooth volume switching experience becomes crucial.

Aesthetically Pleasing

ASUS is well known for its quality control, but beyond the hard and cold facts of humidity storage and drop test, there's the soft appeal and the intrinsic properties that we look into when it comes to material selection. Whether it is sweat-proof and finger print free surface finish, an elegant color palette or smooth curvatures, it is our commitment to bring a state-of art audio with innovative material application and usage.

Feature Summary

- Native DSD Support via DOP
- World's first 8X symmetrical upsampling technology restores lossless audio
- Built-in 600ohm headphone amplifier drives all headphones on the market
- Ultra-high 120dB SNR for the purest sound
- User customizable tone characters with 11 swappable OP-amps
- Dedicated internal linear power supply ensures the cleanest audio

Ultimate audio enjoyment with native Direct Stream Digital (DSD) support via DOP

Digital Stream Digital (DSD) is an encoding technology at 1 bit representation of the audio waveform, allowing high reproduction of the original audio. With native DSD support via DOP, the DSD container bypasses operating system through ASIO PCM, hence allowing audiophiles to enjoy high-fidelity audio.

384kHz/24Bit 8X Symmetrical Upsampling Technology to restore lossless audio

The Essence One Series series can support up to 384kHz for multiples of 48kHz and 352.8kHz for multiples of 44.1kHz. This ensures that all sample rates are symmetrically upsampled without any loss of resolution that provides pure representation of audio content.

Built-in 600ohm headphone amplifier drives all headphones on the market

Supports up to 600ohms impedance, allowing headphone enthusiasts to enjoy the best of their favorite headphones without any additional amplification needed. The headphone amplifier powers up all Hi-Fi headphones with high performance and low distortion.

Ultra-high 120dB SNR for the purest sound

The SNR of normal USB DAC is about 110dB. With the extremely high SNR (>120dB), the Essence One Series provides audiophiles clearer sounds with every details with significantly reduced noise level.

User customizable tone characters with 11 swappable OP-amps

Op-amp is the key part that amplifies the analog signal in your soundcard and affects tone characters (darker, brighter, sound image etc..) We respect your personal taste and preferences and on our model you will find 11 swappable op-amp sockets. The Essence One Series allows easy customization to swap in your favorite op-amps for a fully customized audio experience.

Dedicated internal linear power supply ensures the cleanest audio

A clean power source is crucial for ensuring minimal supply contamination and consistent power delivery. The toroidal comes with a specially designed silicon strip to prevent hysteresis loss The internal power supply supports all international voltages and has generous margins for over and under voltage conditions. It provides cleanest power for cleanest sound with excellent immunity to noise on the AC line.

Minimal Clock Jitter with Asynchronous Data Transfer:

Most USB audio uses Synchronous Data Transfer mode to adjust internal clock to compensate different data transfer rate between PC and USB Audio Device.

However, the jitter is worse if the transfer rate is a lot different between PC and Device.

For the Essence One Series, the USB DAC monitors the PC clock transfer speed and adjusts the data transfer speed accordingly based on a buffer status to the system. When the PC clock is firing too fast, this is regulated and the data transfer feed is adjusted to slow down and vice versa. This greatly improves the precision of digital audio and provides more detail with less listening fatigue.

Bit-perfect with ASIO 2.2 driver:

Bit-perfect mode allows user to use ASIO or similar function while doing audio playback, avoiding any sample rate conversion being done by PC's operating system. This feature keeps audio contents of all resolutions being played as its original sample rate without any potential quality loss during sample rate conversion.

The ASIO 2.2 driver simplifies the process of multiple audio streams, bypassing latency issues in Windows, to deliver a low-latency, high fidelity sound file that is identical to the original audio file.

Dedicated volume controls:

Most USB DACs on the market only comes with one or no volume control for both headphone and speaker. This prevents user from keeping their favorite volume level and has to keep adjusting volume when switching between devices. Not to mention that a careless move can easily cause damage to your headphones.

The Essence One Series has an independent volume control for headphone and speaker such that user can keep their favorite volume level without switching back and forth when listening to different output devices.

Toslink and Coaxial S/PDIF inputs:

The Essence One Series is fitted with both Coaxial and Toslink inputs, enabling connection of multiple sources. The digital inputs accept data formats at sample rates up to 192 kHz.

Balanced XLR output:

Essence One Series also features balanced (XLR) outputs. This is a higher quality output that is useful for eliminating unwanted noises and interference. Since a balanced line contains two signal carrying conductors of equal magnitude but opposite polarity, noises induced along the cable path cancel each other out when they reach the destination load. This makes balanced lines the professional applications for long cable connection which induced noises might be a problem. XLR connectors should be wired as follows:

Pin 1- Ground; Pin 2- Hot (in-phase); Pin 3- Cold (phase-inverted).

Product Line Up

	Essence ONE	Essence ONE PLUS EDITION	Essence ONE MUSES EDITION	Essence ONE MKII	Essence ONE MKII MUSES EDITION
Key Audience	Entry-level audiophiles	Op-Amp lovers and DIY adventurers	HI-FI adventurers	Entry-level audiophiles	HI-FI adventurers
Key Focus	Desire to enjoy high fidelity music on both headphone and speaker	Desire to DIY and customize sound based on personal preferences	Desire to experience high fidelity music with world known Muse01 Op-Amp	Desire to enjoy high fidelity music on both headphone and speaker	Desire to experience high fidelity music with world known Muse01 Op-Amp
Audio Clarity	120dB SNR Hi-Fi audio clarity				
Audio Precision	Ultra jitter-free fidelity with asynchronous USB audio interface				
Op-Amp Selection & Tonal Customization	Customizable tone characters with 11 swappable Op-Amps, focusing on 6 key Op-Amps	Op-Amp Tweaking Kit with additional TI-2132 (4 pcs) and NS-4562 (2 pcs) and tweaking tool set	Unimaginably heart-touching and spacious sound powered by MUSES 01 Op-Amp (6 pcs)	Customizable tone characters with 11 swappable Op-Amps, focusing on 6 key Op-Amps	Unimaginably heart-touching and spacious sound powered by MUSES 01 Op-Amp (6 pcs)
Powerful Headphone Amplifier	Headphone amplifier for up to 600ohm headphone impedance				
Clean Power	Dedicated linear power supply				
Additional Features	8X Upsampling to 384kHz				
	--	--	--	Native DSD Support via DOP	Native DSD Support via DOP

Design Highlights

Power Management

- **High-fidelity LDO Regulation**
  Using the highly regarded LDO regulators, the power source is regulated twice to reduce heat energy and ensure stable power.

- **Robust Capacitor**
  WIMA FKP2 capacitor serves as a stable water reservoir for stabilizing power source, hence reducing ripples.

- **Toroidal transformer**
  Specially designed toroidal transformer to reduce hysteresis loss and prevent easy worn-out.

Signal Management

- **4-Layer Hyper grounding with balanced design**
  4 layer PCB board for separating Digital and Analog signals on different grounds and heat source. Not only are the analog and digital signals are on different layers, it is sandwiched in between multiple ground layers to further prevent signal interferences.

- **Asynchronous data transfer**
  PC uses a different clock system than E3 and hence a buffer will monitor the data speed such that when the PC clock is firing too fast, this is regulated and the data transfer feed is adjusted to slow down. This greatly improves the precision of digital audio and provides more detail with less listening fatigue.

- **384kHz/ 24Bit 8X Upsampling Technology**
  While common upsampling USB DACs just transfer whatever audio source to 192kHz indistinguishably, Essence One Series upsamples 44.1/88.2 /176.4kHz input to 352.8kHz and 48/96/192kHz input to 384kHz in a symmetrical way, preserving the originality of your music collection. It also upsamples bit-rate to 32bit corresponding to the original contents. (Note: 44.1x8=352.8kHz; 48x8=384kHz)

NOTES:
- Sample rate is the number of samples of audio carried per second, measured in Hz or kHz (one kHz being 1,000 Hz). The more samples per second (the higher the "sample rate"), the better the quality.
- Bit rate measures how much data is transmitted in a given amount of time. The higher the bit rate, the higher the quality of the audio playback and the larger the file.
- Upsampling is the process of increasing the sampling rate of a signal. For instance, upsampling raster images such as photographs means increasing the resolution of the image.
- Therefore, upsampling both sample rate and bit rate will make your audio source sound clearer.

- **Custom Resistor with high temperature and heat tolerance**
  0.1% tolerance and high tolerance for temperature changes with +/-0.5ppm/Celsius with ultra-low noise and better stability.

- **DC Servo to reducing DC biasing:**
  The DC servo design helps to reduce decoupling and this helps to extend bass performance with richer and deeper sounds.

Ease of Use & Customization

- **DSD Support**
  DSD Support for USB 2.0

- **Bit Perfect Mode**

  Bit-perfect mode allows user to use ASIO or similar function while doing audio playback, avoiding any sample rate conversion being done by PC's operating system. This feature keeps audio contents of all resolutions being played as its original sample rate without any potential quality loss during sample rate conversion.

  NOTE: When you run bit-perfect in Windows, the "BIT PERFECT" LED in the front panel will light up.

Component Selection

- DAC: TI PCM1795: Excellent dynamic performance (123dB dynamic range) and improved tolerance to clock jitter
- DSP: ADI ADSP-21261 High-performance audio processing capabilities and strong reliability for handling upsampling and DSD support
- WIMA FKP2/FKS2: High temperature tolerance with robust performance
- Swappable Op-amps: NE5532
- Swappable Op-amps: LM4562 (for Speaker out)
- Swappable Op-amps: LME49720NA (for Headphone out)
- Headphone Amplifier: NS LME49600TS (for Headphone out)

Package contents

This package should contain the following:

- Essence One Series Hi-Fi USB DAC x 1
- USB cable ('B-A' type) x 1
- Power cord x 1 (Some versions may have 2 power cords for different countries)
- 6.3mm to 3.5mm adaptor x 1
- Quick start guide x 1
- User guide x 1
- Audio Precision (AP) test report x 1
- Installation driver CD x 1

  NOTE: The package contents vary with models. Refer to the package contents for each model on ASUS website at www.asus.com

System requirements

To ensure a successful installation of the ASUS Essence One Series USB DAC, your computer must meet the following requirements:

- IBM compatible PC with one USB2.0 (or higher) compatible port for the USB audio device
- Microsoft® Windows® XP/7/8/8.1 (32/64 Bit) / MacOSX 10.6
- Intel® Pentium® 4 1.4GHz or AMD Athlon 1400 CPU or faster CPU
- 256 MB DRAM system memory
- 60 MB available HDD space for driver installation package
- CD-ROM drive (or DVD-ROM drive) for software installation
- High-quality headphones or powered analog speakers to enjoy the ultra-high fidelity sound of the card

Driver installation

After connecting ASUS Essence One Series with your computer by the bundled USB cable, you need to install the device driver that enables the Essence One Series to work with Windows operating system.

NOTES:
- The driver is only needed when you connect ASUS Essence One Series with PC/NB.
- The version and content of the support CD are subject to change without notice.

To install the device driver:

1. Insert the ASUS Essence One Series support CD into your optical drive. If Autorun is enabled, the ASUS Essence One Series driver screen appears automatically. Go to step 4. If Autorun is not enabled in your computer, perform step 2.
2. Click **My Computer** on your desktop and double-click the optical drive icon.
3. Double-click the **setup.exe** icon located on the optical drive.
4. Follow the on-screen instructions to complete the installation. Read the **END USER LICENSE AGREEMENT** in the process and make sure that you understand and accept it before continuing the installation.
5. When the installation finishes, you may be prompted to restart your computer. You can choose to restart the computer later if desired.
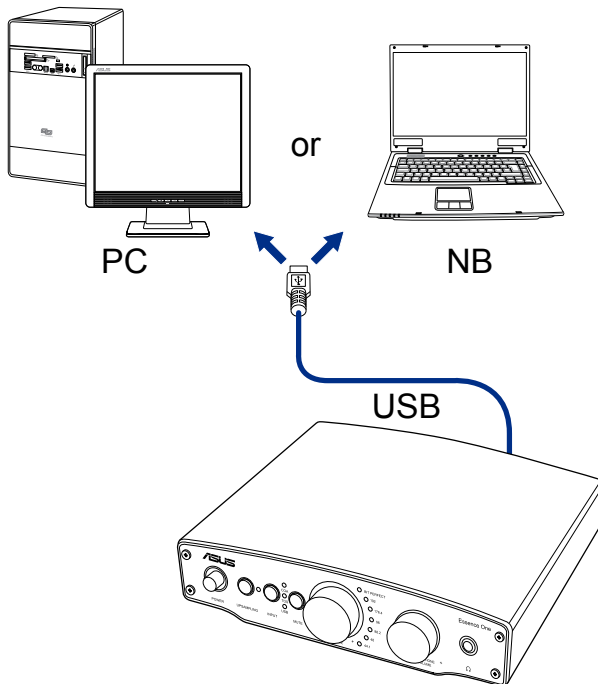
Functionality

1. USB DAC (Digital-to-Analog Convertor)

Clear, detailed, life-like sound for your digital music collection in PC/NB, with all the connection(XLR, RCA) you need for end devices.

Steps:

- Connect PC/NB with an USB cable
- Need to install driver in your PC/NB to work
- Select "USB" in front panel as the input source

2. Stand alone DAC

With S/PDIF in and input select, it also serves as an independent DAC which connects with digital inputs such as CD audio source and then plays to the end devices.

Steps:

- Connect with other audio resource with S/PDIF input (by Coaxial/Optical cable)
- Select COA (coaxial input) or TOS (optical input) in the front panel as the input source
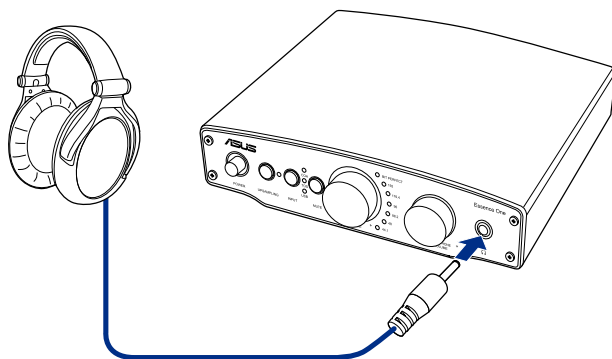

CD/DVD player

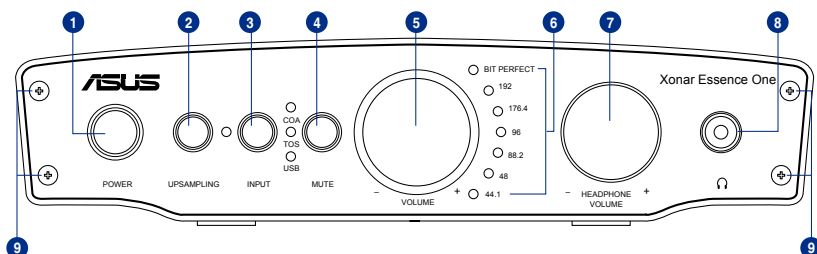S/PDIF
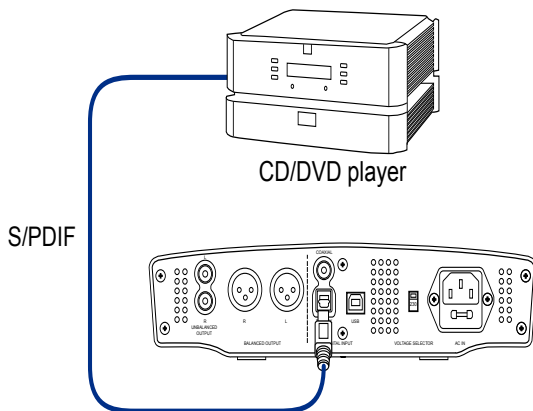
3. Headphone amplifier

Grants 100% performance of ALL hi-end headphones, even with impedance up to 600ohms, providing extra dynamics and sound details.

Steps:

- Connect with high-quality headphones/headsets

Front Panel

1. Power On/Off

Press to turn on and again to turn off.

2. Upsampling function on/off

(1) Press to turn on the upsampling function which increases sample rate to 352.8 or 384kHz symmetrically and bit rate to 32bit

(2) When the upsampling function is turn on, the LED light of Bit perfect / sample rate indicator will light off.

> **NOTE**: For models EONE MKII/ EONE Muses MKII , the upsampling LED indicator turns red when the DSD function is on. Under the DSD mode, the upsampling mode is disabled.

3. Input selection

Press to select among USB, Toslink or Coaxial Inputs. The corresponding LED will light up to show which source has been selected.

4. Mute

Press to mute headphone and speaker output; again to unmute.

5. Speaker Volume control

The Volume Control controls the output level of the balanced XLR and unbalanced RCA analog outputs.

6. Bit perfect / sample rate indicator

(1) The relevant LED will light up to indicate the sample rate of your audio source (44.1kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz)

(2) Bit perfect: light on under ASIO model

7. Headphone Volume control

The Volume Control is used to control the output levels of the headphone jacks.

8. 1/4" Headphone output

Connect your high-quality headphones/headsets with 6.3mm connector (Please use the attached 6.3mm to 3.5mm connector if your headphones/headsets are of 3.5 mm ports)

9. Set screws

These 4 screws are used to hold the machine bed (including PCB board and power module) and machine housing together. For repair's sake, ASUS technicians may need a small screwdriver to loosen the 4 screws to remove the front panel and then draw the machine bed out for checking PCB board (or power module).

Rear Panel
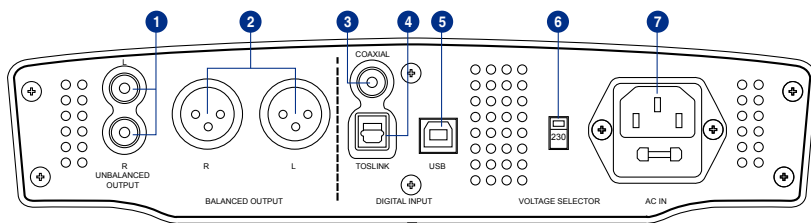
1. Unbalanced RCA Output (line-out)

Conventional stereo outputs for connection to the line-level phono/RCA inputs of a speaker

NOTES:
- Most audio equipment has unbalanced audio inputs and outputs. This means that the audio output (left, right, or mono) appears on a single wire, and is referenced to "0V" or "Ground". Typical connectors used are RCA "phono" connectors and 1/4" (6.3mm) or 1/8" (3.5mm) jack plugs/sockets.
- Unbalanced audio works well for short cable runs in low noise environments. For long distances connection or complex setups where RF noise may be a problem, Balanced XLR Output is recommended to eliminate unwanted noises.

2. Balanced XLR Output(line-out)

ASUS Essence One Series also features true balanced (XLR) outputs. Connect Essence One Series with equipment such as speakers of Balanced XLR connections.

NOTES:
- A lot of professional equipment will have balanced audio inputs and outputs, usually on 3-pin "XLR" connectors. The line is said to be balanced since the two signal carrying conductors are of equal (though opposite) potential.
- Balanced XLR Output is a higher quality output that can reject noise and interference with equipment with balanced inputs, especially perfect for long cable runs or anywhere that induced noises might be a problem

3. **Coaxial S/PDIF Input**

   Connect your digital source, such as CD/DVD players or computer with S/PDIF output, to digital input. Use either S/PDIF coaxial or Toslink optical type, each being of equal quality.

4. **Toslink Optical Input**

   As mentioned in point 3, this port is for Toslink Optical Input.

NOTES:
- Both Coaxial and Toslink Inputs can be used to connect and run equipment at the same time
- This unit only accepts two-channel LPCM digital audio (e.g. Dolby Digital 2.0). You cannot connect a Dolby Digital 5.1 or a DTS signal as they will not be recognized. If you wish to connect a DVD or similar device, please ensure that the sound output of your player is set to two-channel PCM.

5. **USB port**

   Connect a PC via a Type B to Type A USB lead.

NOTES:
- The Essence One Series's operation is independent of your PC soundcard-it will operate whether your PC has a soundcard or not. Please select Essence One Series as the default audio playback device in your system. This can be confirmed in the Control Panel's Sounds, Speech and Audio Devices properties window under the Volume tab.
- You need to install the device driver that enables the Essence One Series to work with Windows operating system.

6. **Voltage selection (115/230V)**

   Always insure that the voltage setting is correct for your locality. See page 4 "Voltage Selection" for more information.

7. **Power port (AC in)**

   Plug the supplied power adaptor into the Essence One Series once you have completed all connections.
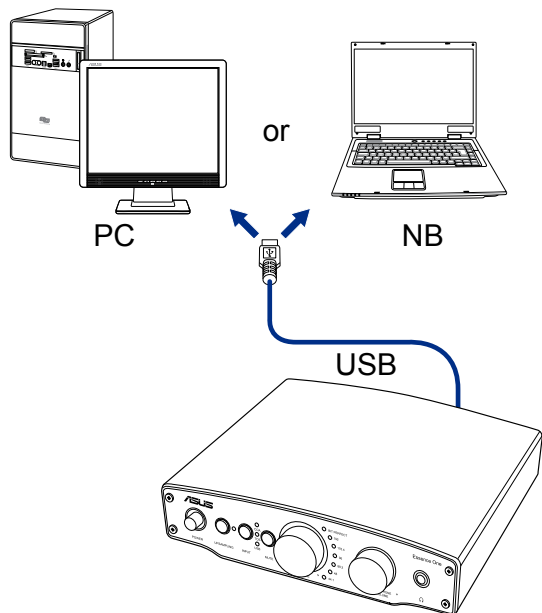
Connections

Input

1. NB/PC-USB connections

NOTE: Do not turn on the machine until all connections have been made.

(1) Connect a USB 'B–A' type lead (as illustrated at left) from the Essence One Series's USB input to one of the USB ports on the PC/NB.

(2) Turn on the Essence One Series using the front panel On/Off switch and make sure that the USB input is selected (USB LED lit).

(3) Install the device driver that enables the Essence One Series to work with Windows operating system.

NOTES:

• The PC's previous audio output device should now be temporarily disabled and the Essence One Series becomes the default audio playback device for the PC/NB. This can be confirmed in the Control Panel's Sounds, Speech and Audio Devices properties window under the Volume tab.

• If you wish to disconnect your Essence One Series and return to using your previous soundcard, etc., simply disconnect it or switch off the power on the front panel. If the PC fails to disable the Essence One Series and automatically re-enable your default soundcard, you can manually disable the Essence One Series in the hardware device manager. To do this, navigate to the Device Manager (click Start — Control Panel — (Vista: Performance and Maintenance —) System — Hardware— Device Manager in Windows XP). Scroll down the device manager window and expand the heading Sound, Video and Game Controllers to display a list of the connected devices. The Essence One Series will be listed as "ASUS Essence One Series". Click on this description to highlight in blue and then click on the Disable icon at the top of the window. A warning message will appear: "Disabling this device will cause it to stop functioning. Do you really want to disable it?" Click Yes to disable the Essence One Series. The previous audio playback device will now be re-instated by Windows.

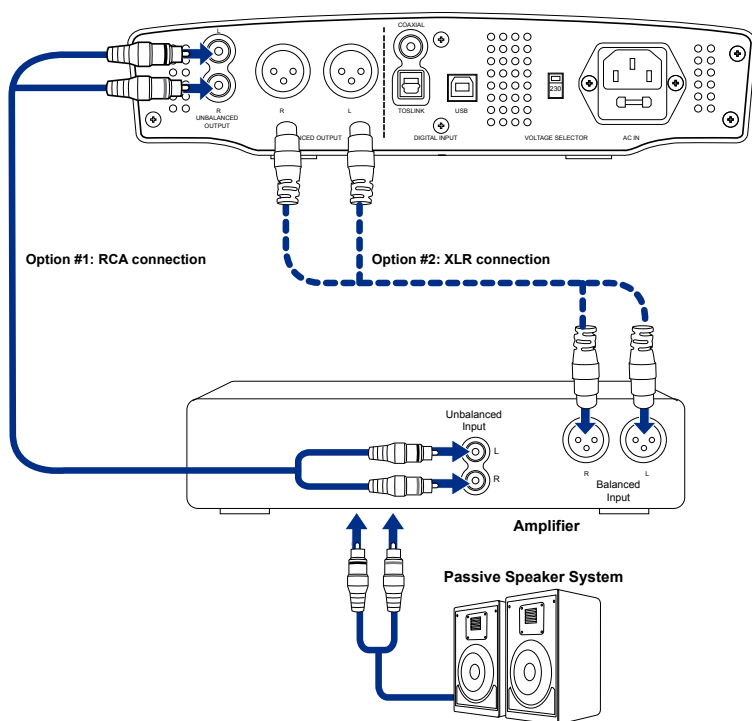## 2. Toslink and Coaxial S/PDIF audio input connections
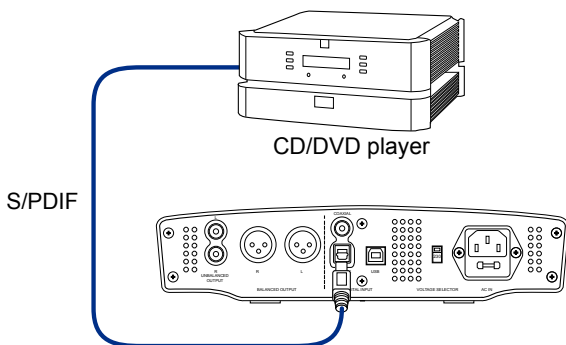
CD/DVD player

S/PDIF

(1) Connect your digital source (ex. CD/DVD players or some PC/NB with SPDIF output) to Digital Input. Either S/P DIF Coaxial or Toslink optical types can be used, each being of equal quality.

NOTE: Both Coaxial and Toslink Inputs can be used to connect and run equipment at the same time.

Output

1. With Amplifier and Passive Speaker System

Option #1: RCA connection   Option #2: XLR connection

Unbalanced Input
L
R

Balanced Input
R   L

Amplifier

Passive Speaker System

(1) Use either the unbalanced (RCA/Phono) or balanced (XLR) outputs of the Essence One Series to connect unbalanced or balanced inputs of an amplifier.

(2) Connect the amplifier with a Passive Speaker System.

NOTE: It is possible to use the RCA phono connections and the XLR balanced connections at the same time, e.g. for connecting to different amplifiers or multi-room operations. However, no same audio quality is guaranteed as using RCA and XLR output non-simultaneously.
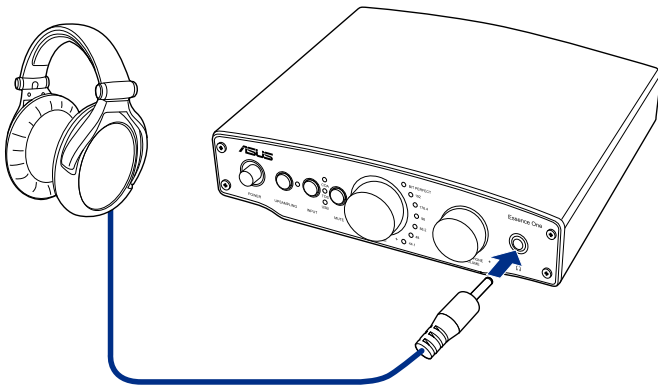
2. With Active Speaker directly
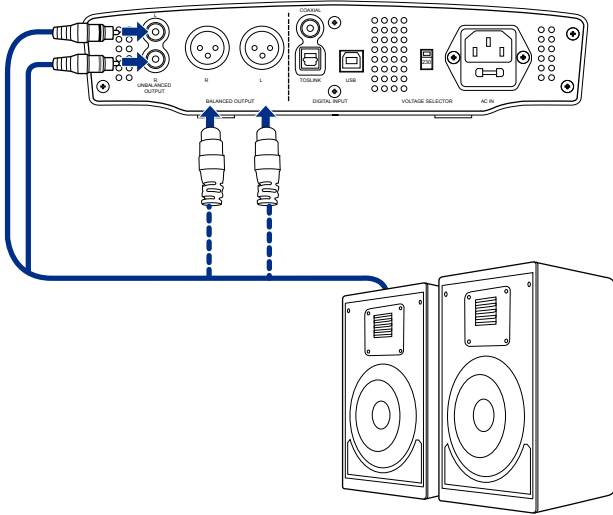
Active speaker

(1) Connect Essence One Series with a set of active speakers directly.

3. With Headphone/Headset

(1) Connect Essence One Series with high-quality headphones/headsets directly.

Specifications

Items	Description
Audio Performance	
Output Signal-to-Noise Ratio (A-Weighted):	120dB
Output Total Harmonic Distortion + Noise at 1kHz@-3dB (A-Weighted):	-110dB
Output/Input Full-Scale Voltage	Balanced Output: 4Vrms
	Unbalanced Output: 2Vrms
	Headphone: 7Vrms
Frequency Response (-3dB, 24-bit/192kHz output):	<10Hz to 48kHz
Bus Compatibility	
USB	USB 2.0 High speed
S/PDIF	IEC 60958
Main Chipset	
Audio Processor	C-Media CM6631/ CM6631A
S/PDFI Receiver	AKM 4113
DSP	ADI ADSP-21261
D-A Converter for Analog Inputs	TI PCM1795
OP Amp	
Headphone	I/V: NE5532
	LPF: NE5532
	Current Buffer: LME49600
Balanced / Un-balanced I/V	NE5532
Balanced / Un-balanced LFP	NE5532
Clock	
Crystal clock	12MHz For USB
	24.576MHz For S/PDIF
Oscillator	45.1584MHz (for 44.1, 88.2, 176.4KHz sample rate)
	49.152MHz (For 48, 96, 192KHz sample rate)
Sample Rate and Resolution	
Analog Playback Sample Rate and Resolution	44.1K/48K/88.2K/96K/176.4K/192KHz @ 16/24bit
Upsampling capability	Up to 352.8kHz (44.1/88.2 /176.4kHz input) or 384kHz (48/96/192kHz input), 32bit
I/O Ports	
Output Jack:	Balanced Output (XLR)
	Unbalanced Output (Dual RCA)
	6.3mm Jack headphone output
	Metal with plated gold, black housing

Specifications

Input Jack:	USB jack
	Coaxial / Toslink jack
	Metal with plated gold, black housing
Power Input Jack:	IEC AC Inlet
Volume controller	Balanced Output: Quad Units Taper B Potentiometer
	Headphone Output: Quad Units Taper B Potentiometer
Voltage Selector	AC 115V/223V Slide Switch
Accessories	
Accessories	USB cable ('B-A' type) x1
	Power cord x1 (Some versions may have 2 power cords for different countries)
	6.3mm to 3.5mm adaptor x1
	Quick Start Guide x1
	User Guide x1
	Installation driver CD x1

* Specifications are subject to change without notice.

Essence One Series
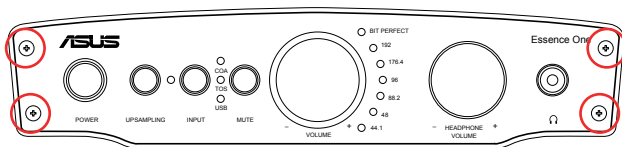
Hi-Fi USB DAC (Digital-to-Analog Converter)
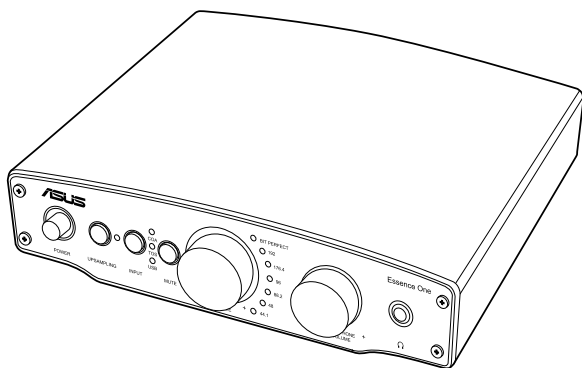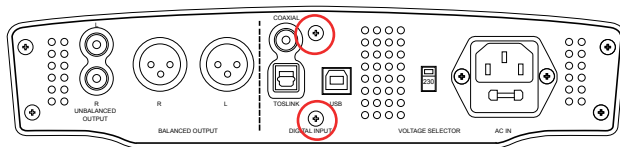
Opamp Swap Guide

1. Disassembly

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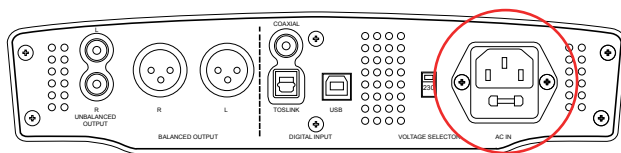
Front Panel

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.

2. Swap Guide

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.
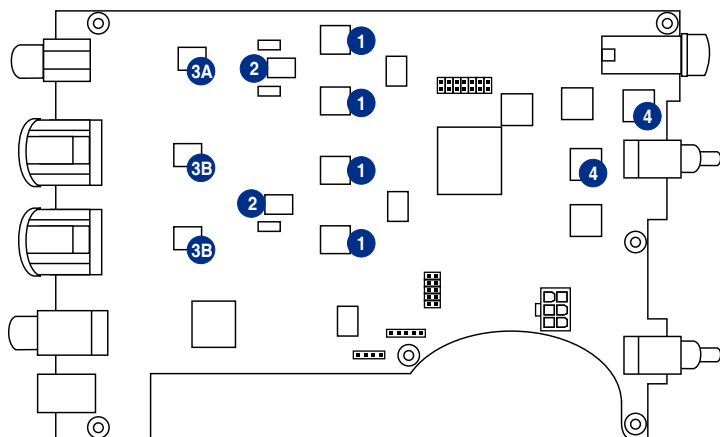
1. Serves as I/V (current to voltage convertor) that turns current from DAC into voltage for output purpose. Changing this will affect all outputs (including Headphone output, RCA output and XLR output).
2. Serves as Low Pass Filter that filters background noises. Changing this will affect all outputs (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.

Opamp \ Output	All outputs (Headphone output, RCA output, XLR output)	Headphone output	RCA output	XLR output
1	√			
2	√			
3A			√	
3B				√
4		√		

Recommended OPamp List

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

Sound Impression

The following table lists the sound impression brought by different combinations of op-amp pairing.

DAC I/V Slot 1	DAC buffer Slot 2	Sound Impression
TI – OPA2107	TI – OPA2132	Brighter vocal, slightly less booming sound
TI – OPA2107	NS – LME49860	Even brighter than the above combination, and more detailed with less but tighter booming sound
NS – LME49720	NS – LM4562NA	Less warm than stock OP-amps, more extensive detailed and dampened mid-range, 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; less detailed present.
NS – LME49720NA	NJRC – MUSE02	Brighter, thinner sound and more detailed than the above combination

Essence One Series

Audio Precision Test Report

- Disclaimer: The information and contents contained in this test report are for Essence One Series user's reference only and may not be altered in any manner. Test results may vary with different testing environment and equipment.

Audio Precision Test Report

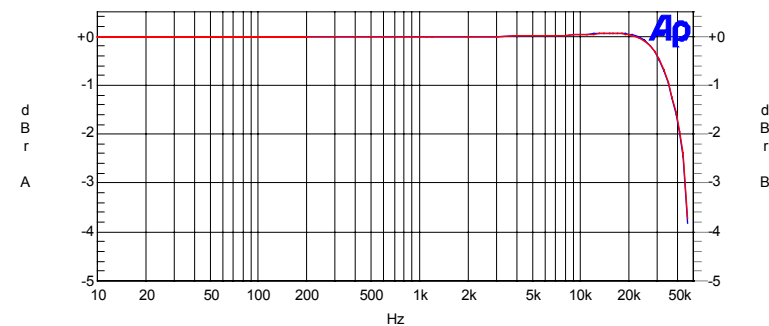Test Signals: 96KHz, 24bit (192KHz, 24bit for frequency response test)

Noise Level

(SNR~120dB)

Audio Precision   A-A FFT SPECTRUM ANALYSIS   07/15/11 10:34:20
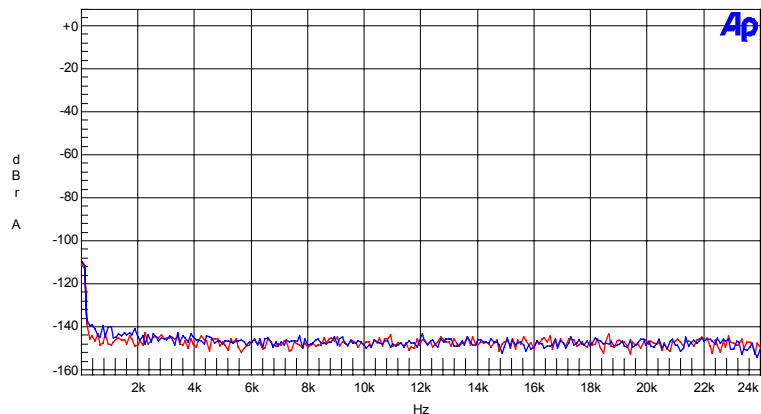
Frequency Response

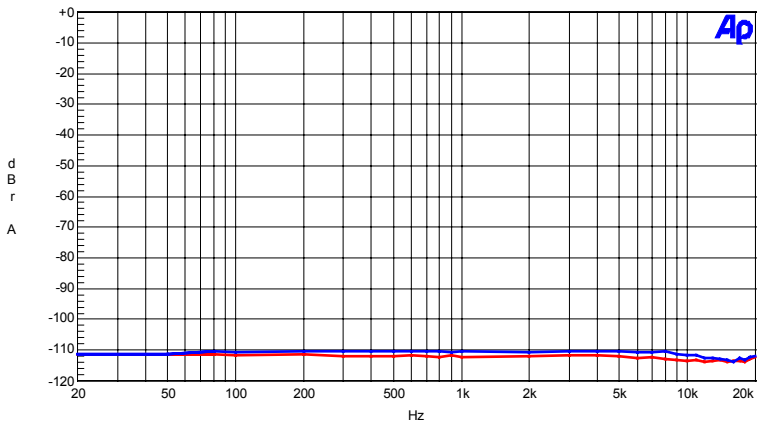Audio Precision   07/15/11 11:11:49

THD+N Full Band

(-114~-110dB for 20~20KHz)

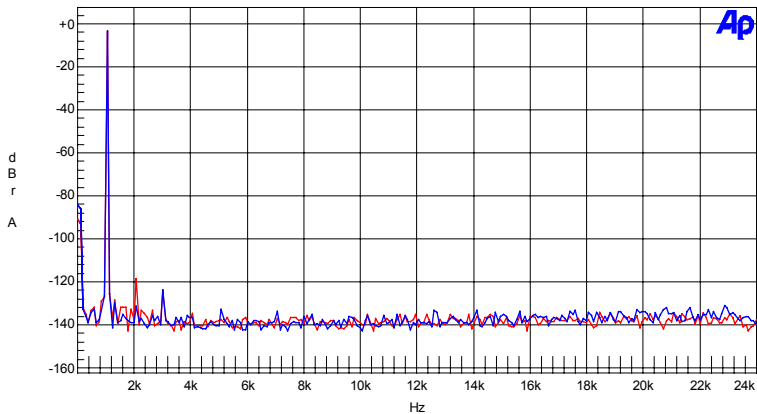Audio Precision   07/15/11 10:40:54

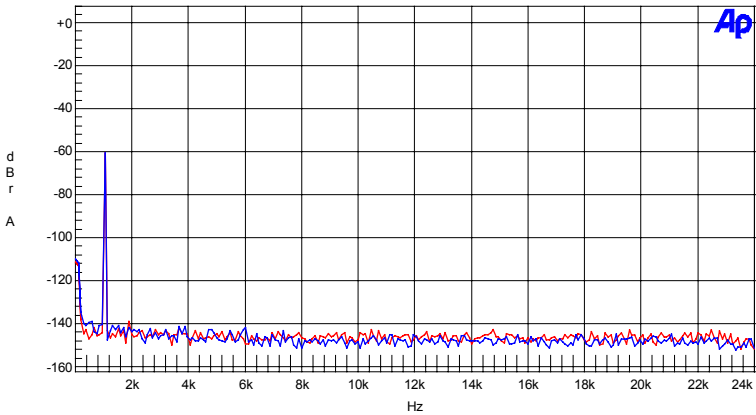## THD+N 1KHz

0.0003%

(-110dB) @997Hz
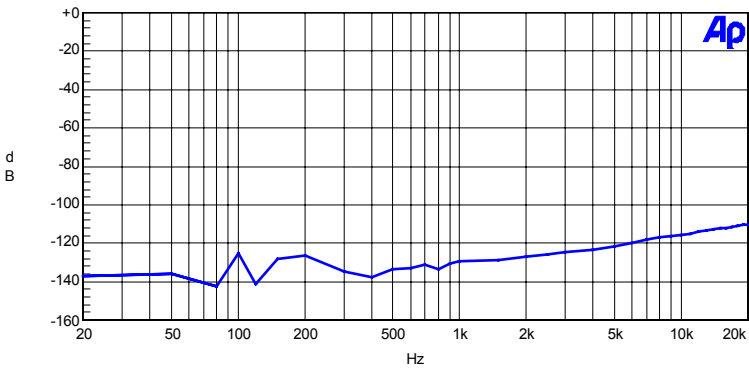
Audio Precision   A-A FFT SPECTRUM ANALYSIS   07/15/11 10:37:25

Dynamic Range

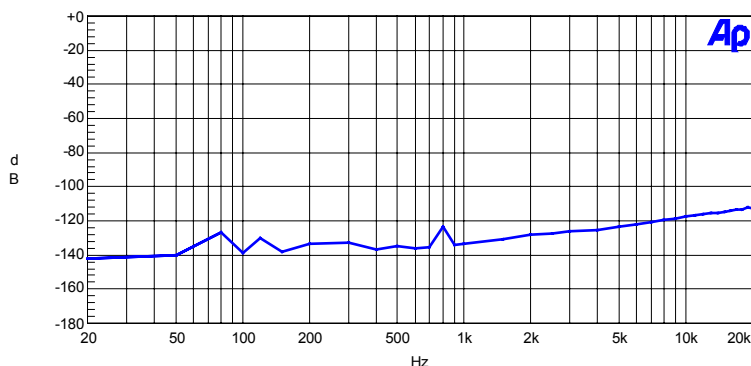# (~120dB)

Audio Precision　　　　A-A FFT SPECTRUM ANALYSIS　　　　07/15/11 10:35:38

Crosstalk

-132dB @ 1KHz

-142~-115dB for 20~20KHz

Left

Audio Precision　　　　　　　　　　　　　07/15/11 10:46:20

Audio Precision   07/15/11 10:48:30

Appendix: Glossary

- **Noise Level**

The level of any undesired system noise signals over the audio spectrum, including AC mains hum, white noises, stray magnetic field, etc.

- **SNR**

Signal-to-Noise Ratio, the ratio of the maximum amplitude signal to the sum of the noise energy. The higher, the better.

- **THD+N**

Total Harmonic Distortion plus Noise, measured by attenuating the fundamental signal with a narrow band notch filter, then measuring the remaining signal which consists of harmonics of various order. This implies the linearity of the audio converter and the lower, the better.

- **Frequency Response**

A measure of a device's ability to respond to a fixed input voltage, at different input frequencies, and the difference in amplitude reproduced for each frequency. The flatter curve at wider frequency range is better.

- **Dynamic Range**

The difference, usually expressed in dB, between the highest and lowest amplitude portions of a signal which a device can linearly handle. Ideally it should be very close to SNR value and the higher, the better.

- **Crosstalk**

Unwanted signal coupling from another channel of stereo or multi-channel transmission. The lower value is better.