



DIASONIC TECHNOLOGY CO., LTD.



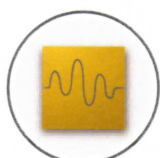
SHUTTLE DAC

HIGH RESOLUTION AUDIO



Hi-Res
AUDIO

High Resolution Audio
DSD, FLAC, WAV / 32bit 384kHz



DAC
AK4490



DSD, FLAC, WAV



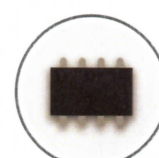
32bit 384kHz



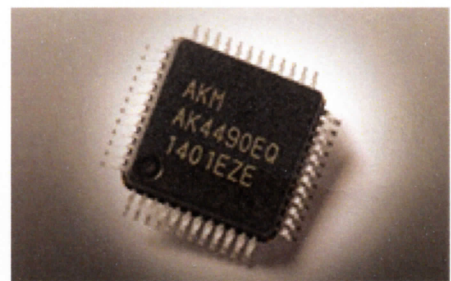
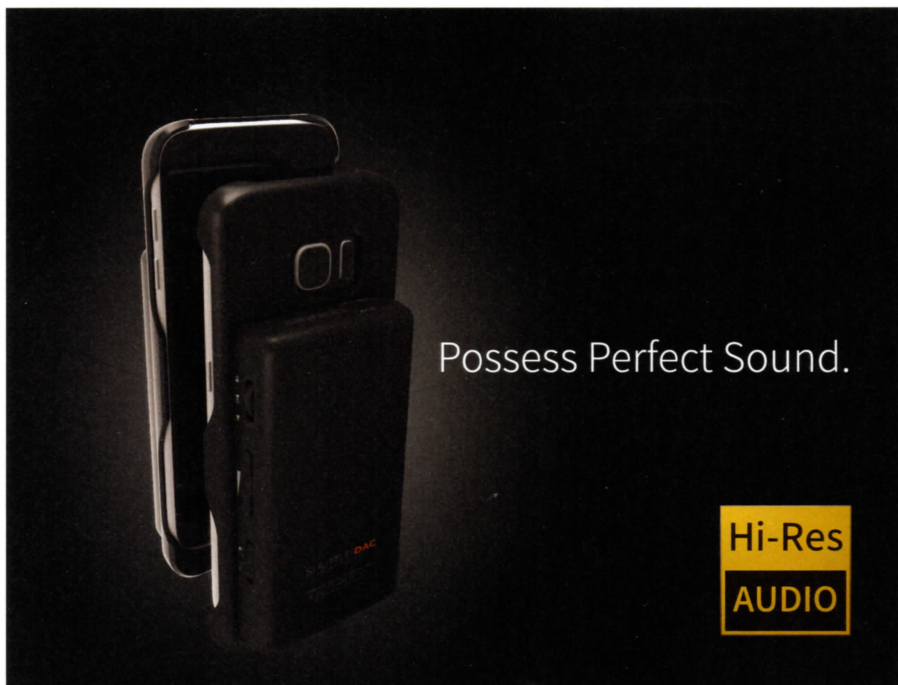
Wireless Charger
& Extra Battery



Extra Line Out



High-Fidelity,
Bi-Input Op-AMP



All for Absolute Sound Premium Hi-Fi Audio Solution 32bit / 384kHz

Premium 32-bit D/A Converter, "AK4490", enables reproduction of original acoustic sound in portable audio. The AK4492 accomplishes low distortion and low power consumption at the industry's highest level with AKM's VELVET SOUNTECH technology and original process dedicated to audio products. High-resolution audio sources are supported for digital input, up to 32bit/384kHz PCM and 11.2MHz DSD256, DXD (352.8/384kHz) data.

Abiding Power Capacity

- 3,000mAh 3.7V Li-ion Battery
- STD-1 provides extra power source to the smart phone through its internal battery.
- Using the Micro USB at STD-1, the internal battery can be charged and smart phone.



Clear Signal Components

- STD-1 has dual 3.5mm Audio-out terminal (Headphone, Line-out) that Gold-Plating applied to improve signal quality.
- All accessories are applied Gold-Plating finish.



Line connected Charging

- 3-half hours (STD-1) and 3 hours (Mobile Phone) by Quick Charger, 5V/3A



Wireless (Qi) Charging

- 4-half hours (STD-1) 5V/1A



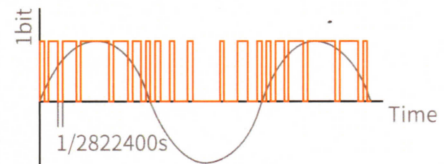
DSD, Direct Stream Digital

DSD has not been broadly successful in the consumer markets and brings new challenges if immediate manipulation of the recorded data is desired. PCM is far easier to manipulate and is more easily built into existing applications such as the advent of very-high-resolution PCM media and tools, such as DXD. DSD however is used as a master archive format in the studio market and seen as a possible low-noise replacement for analog tapes. As a little quality is lost when converting from DSD to PCM, the debate continues as to whether the ultimate quality digital audio can be found by using DSD players or recording directly into a high quality PCM format in the first place.

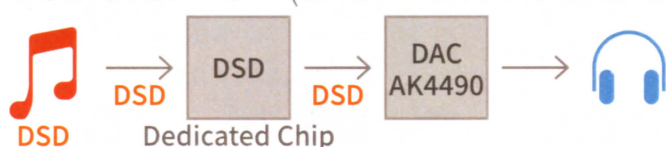
DSD uses pulse-density modulation encoding—a technology to store audio signals on digital storage media that are used for the SACD. The signal is stored as delta-sigma modulated digital audio; a sequence of single-bit values at a sampling rate of 2.8224 MHz (64 times the CD Audio sampling rate of 44.1 kHz, but only at 1/32768 of its 16-bit resolution). Noise shaping occurs by use of the 64-times oversampled signal to reduce noise/distortion caused by the inaccuracy of quantization of the audio signal to a single bit. Therefore, it is a topic of discussion whether it is possible to eliminate distortion in one-bit Sigma-Delta conversion.

In the DSD format, a sinusoidal signal is represented by 1 bit. It is a digital signal sampled at 5.6MHz. In general, SACD is known to reproduce most music signals while maintaining the sharpness of the sound by extending the sampling frequency to 100kHz and the dynamic range to more than 120dB compared to the Audio CD recorded by 16bit 44.1kHz PCM format.

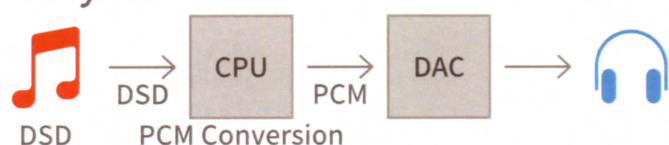
DSD



DSD over PCM (SHUTTLE DAC STD-1)



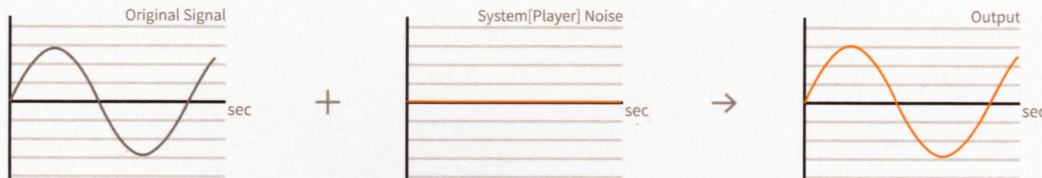
Only PCM



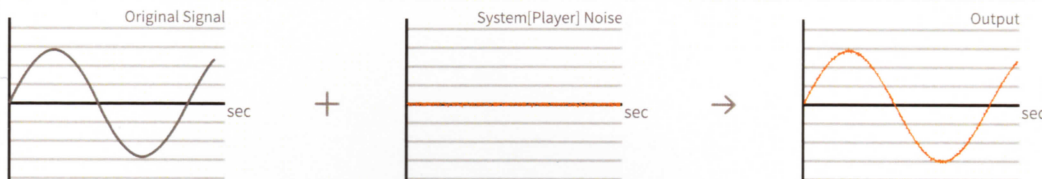
Gleaming-Sound, Bold Performance by SNR Know-How

SNR, Signal-to-noise ratio, is defined as the ratio of signal power to the noise power, often expressed in decibels. A ratio higher than 1:1 (greater than 0dB) indicates more signal than noise. In analog and digital communications, signal-to-noise ratio, often written S/N or SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB) using a signal-to-noise ratio formula. 1bit difference in digital signal has as much as 6dB difference of SNR value. For example, when comparing a device with 113dB of SNR value and SHUTTLE DAC with 120dB, SHUTTLE DAC is considered as twice better performance to produce clear sound than the product with 1bit lower value. Also, when an audio component lists a signal-to-noise ratio of 100dB, it means that the level of the audio signal is 100dB higher than the level of the noise. A signal-to-noise ratio specification of 100dB is considerably better than one that is 70dB (or less). Therefore, in order to enjoy 24bit Hi Res sound properly, it is necessary to have excellent SNR value. If SNR or THD is not good, even if you play 32bit sound source, you can not really feel the difference with existing 16bit or 24bit sound source. DIASONIC has invested a long development period to achieve the best SNR, THD and so on from the beginning of planning and development, and this is the best choice for enjoying Hi-Res Sound with a faithful SHUTTLE DAC.

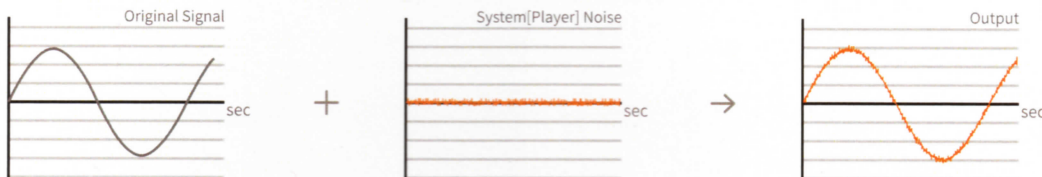
BEST SNR 120dB SHUTTLE DAC STD-1



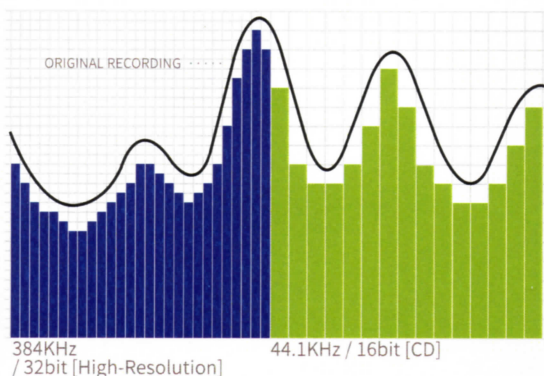
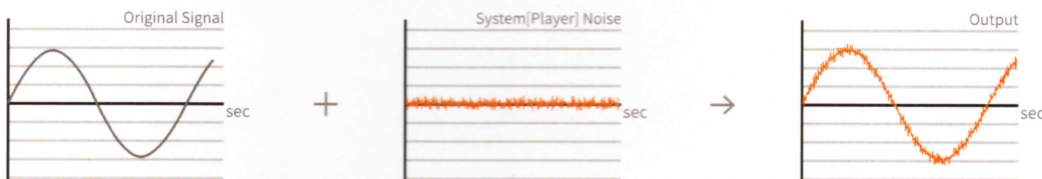
BETTER SNR 110dB



GOOD SNR 95dB

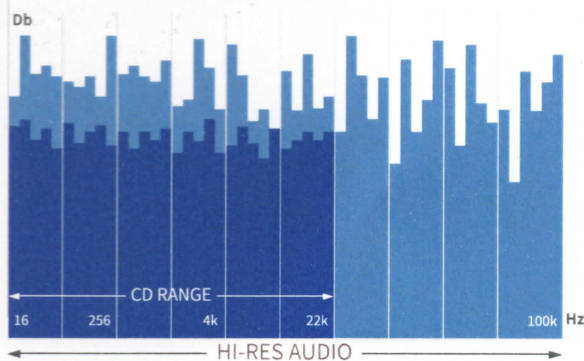


BAD SNR 85dB



Higher Sample Rate than CD

In general, STD-1 has sample rate at 96kHz 24bits or even 384kHz 32 bits, much higher than CDs.



Vivid and Polished Sound

CD and MP3 support at about 20kHz, but high resolution audio supports frequencies over 24kHz (up to 100kHz for this model) and a wide dynamic range

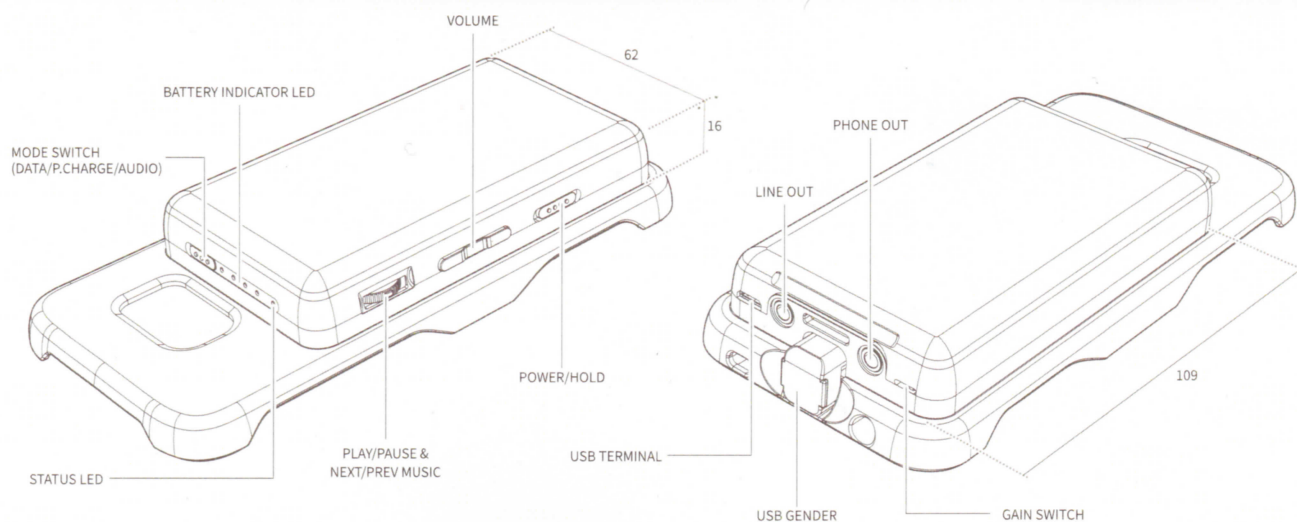
Future Compatibility

Compatible with Galaxy S7 / Galaxy S7 Edge and iPhone 7 / iPhone 7 Plus by replacing Phone Case.

- ※ STD-1 should be matched with proper platform for mobile phone.
- ※ Subsequent models will be added.



Product Features



Specification

Model Name	SHUTTLE DAC STD-1
Color	White, Metallic Blue
Size	62mm x 16mm x 109mm (W/D/H, Phone Case Excluded)
Weight	Apporx. 115g (Phone Case Excluded)
Codecs	DSD, WAV, FLAC, WMA, MP3, OGG, APE (Normal, High, Fast), AAC, ALAC, AIFF, DFF, DSF etc.
Sample Rate	FLAC,WAV,ALAC,AIFF : 8kHz~384kHz (8/16/24/32 bits per Sample) / DSD64 (1bit 2.8MHz), Stereo / DSD128 (1bit 5.6MHz), Stereo
Output Level	Output Power : Max. 125mW Line-out : 2.3Vrms
DAC	AKM AK4490
Decoding	Support up to 32bit / 384kHz Bit to Bit Decoding
Input Ports	USB Micro-B input [for charging & data transfer (PC)] / Connection Mode : MTP (Media Device)
Profile	USB 2.0, USB Audio 2.0
Outputs Jack (Gold Coating)	3.5mm stereo headphone / 3.5mm stereo line-out
Battery	3,000mAh 3.7V Li-ion Battery
STD-1 Battery Charging (Audio Mode)	Wire charger : 5V / 1.2A (QI Charger : 5V / 1A) Charging time : Up to 3 hours (QI Charger 4 hours)
Battery Life Time	Up to 7 hours (DEFAULT VOLUME PLAY)

Audio Performance

Frequency Response	$\pm 0.023\text{dB}$ (Condition : 20Hz~20kHz) / $\pm 0.3\text{dB}$ (Condition : 10Hz~80kHz)
Signal to Noise Ratio	110dB @ 1kHz, Unbalance
Crosstalk	120dB @ 1kHz, Unbalance
THD+N	0.0007% @ 1kHz, Unbalance
IMD SMPTE	0.0004% 800Hz 10kHz (4:1) Unbalance
Output Impedance	16ohm ~ 32ohm
Headphone Amplifier Output Impedance	1.0ohm
Maximum Headphone Output Power (Per Channel)	124mW into 16ohm 65mW into 32ohm



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