



The most anticipated piece of Hi-Fi equipment for 2012 definitely is the Reference-D1 DUAL. Digital to analog converters that's available today on the market that use discrete R2R Ladder DAC are all more than twice the price of this unit, that make us simply can't wait to find out how this unit performs and compares with others!

Totaldac Reference-D1 DUAL

The Colorful and vibrant Macaron

The audio quality of the Reference-D1 DUAL resembles the colorfully vibrant Macaron, its performances on any kind of music passed with flying color, natural, honest, musical and excellent fidelity, just like the satisfaction from crispy crust and fulfilling inner meringue of macaron melting in your mouth! This is the closest reproduction of sound of the nature!



Specification : Separated PSU Stereo Digital to analog converter: Released in 2012. Analog output terminal; One set each of Balanced(XLR) and Unbalanced(RCA), Headphones output (32-600 Ohms) X 1. Digital input terminal; S/PDIF(RCA) X 1, AES/EBU(XLR) X 1, Fiber optic(TOSLink) X 1, USB(B Type, non-synchronous) X 1. Supported sampling rate(Highest for fiber optics is 96kHz): 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz, 16 to 24 bit. The USB port supports Jplay's 24 bit extreme hibernate mode. Comes with fully functional remote, digital volume control, non oversampling DAC compensation filter(switchable), switchable screen. Class A digital to analog output level. Output 3.3V(Unbalanced), 6.6V(Balanced). Each channel use 200 VishayPG foil naked (VAR) 0.01% super precision resistor for R2R DAC. Comes with two types of feet, rubber and metal cones, aluminum outer casing, PMMA box. Power consumption: 18 Watts. External dimensions(WHD): 360 X 110 X 290mm(DAC unit), 122 X 65 X 180mm(power supply unit). Weight: 4 kgs. Preferred retail price: NT\$438000. Sole distributor HongKong, Taiwan and China: EuroAsiatique LTD (02-27911319)

Material use for the test:

Signal source: MSI Wind Top AE2060 Touch screen computer, Densen B-410XS

Amplifier: Luxman L-505u

Speakers: PMS twenty 23 floor speakers, Tannoy Precision 6.2 floor speakers

Cables: Transparent Reference-Balancing cable, KingRex uART-S USB signal cable

Listening environment:

The listening room 2(Length 5.4 meters, width 4.4 meters, around 23.17 square meters).

Audio equipment used: Sheng Kai wooden diffusors



IF WE had to vote for the most anticipated high end audio equipment for 2012, I'm sure this Reference-c DUAL unit (shortened as D1 in the rest of the text) will definitely nominated, why is that so? All the other R2R Ladder DAC products on the market are more than double of its price, one would be very curious of its audio performance from this very standpoint. Even the overseas reviewers considered the D1 doubtlessly can perform as equal level as the products selling for prices many times higher I say that this unit will give us a lot of anticipation.

A company from France

Totaldac is a company founded by Vincent Brient in June 2010. He started to build his audio system when he was a student 15 years ago. Before he officially founded Totaldac, he was a circuit designer. For many years, Vincent Brient also learned the designing and measurement of speaker and amplifier from John Westlake, who has nothing to do with the speaker brand Westlake but definitely a genius, whose design included Pink Triangle DaCapo Digital to Analogue converter and more recently the M-DAC from Audiolab and DAC Magic from Cambridge

Audio. Vincent also made some prototype, which could be found on his own web pages. The most interesting part in his design is the digital active crossover, which will separate bass from mid and high before the signal is sent to the DAC then to speaker. This took him 15 years to accomplish. After that he tried all the industrial DAC chips in order to find one to meet his expectation, but no one could. Therefore, he decided to design his own ultimate DAC. With his background and research in digital active crossover and DAC chips, Vincent finally made a prototype DAC. This prototype DAC had a lot of compliment from the people visiting Vincent's bass horn system and they asked Vincent to build another prototype DAC for them. Consequently, Vincent decided to found Totaldac to produce this product. You can judge from Vincent's experience and get a clear idea that Totaldac is not a big company. If you have any question, you can just contact Vincent via E-Mail. You don't have to wait long for his reply.

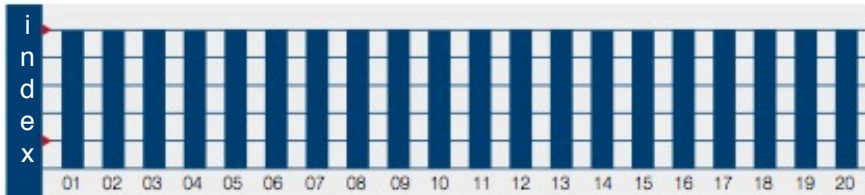
The Sparkle -- R2R Ladder DAC

Those who have seen the review on MSB in No.277 by Chief Editor Liu will know that R2R Ladder DAC is not a new

technology, though which might be considered a solid design by digital professionals. There are some integrated circuit chips that utilize R2R Ladder DAC, such as TDA 1541, PCM 1702 and PCM 1704, etc.. But when the cheap Delta-Sigma DAC hit the market, these DACs were replaced, which made discrete DAC designers had to build their own chip. But obviously, it was too difficult to do for the sake of highly increased cost. Some of the brands which still make R2R DAC are MSB, dCS, emmLabs, Weiss, and now we have Totaldac join in the party. They all receive compliments from all over the world. The R2R DAC like Totaldac needs not I/V conversion. The sound gets cleaner because of the reduction of the I/V conversion. Like some of the NOS DACs, Totaldac is not favor of oversampling, the primary culprit for the existence of "digital sounds".

Designed to reduce the noise floor

When I opened the Totaldac, its internal design reminded me of La Rosita, also a French brand. Both of them are imported by Euroasiatique. There are two circuits inside D-1. The upper one is the R2R Ladder DAC. You are



1.Sound Quality 2.Tonality 3.Treble sweetness 4.Mid richness 5.Bass firmness 6.Width and depth 7.Density and weight 8. Transparency 9.Texture 10.Focus 11.Music liveliness 12. Image and physical presentation 13.Resolution 14.Speed and transient 15.Macro and micro dynamic 16.Instrument and vocal proportion 17.Instrument and vocal quality and airiness 18.Details 19.Presentation of space 20.Overall balance

Reference CD



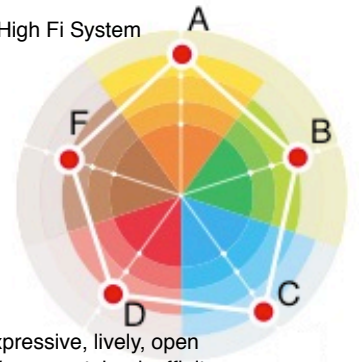
Lorna Hunt's "All in one day": Produced by Michael Hobson of Classic Records label, utilized direct recording method in California's Lompoc theater, with all 5 musicians played together live, without any post processing whatsoever, the result is definitely realistic, this can be seen as Classic Records' signature characteristic. That's why many hi-end compilation album are likely to include some of their songs in them. CR also has the analog master copy to the 24/96 DAD version afterwards, only it is sad that it is no longer available anymore, however some stores might still have some CD versions left, you better hurry if you want one! (RTHCD1015, Joy Audio).

welcome to look closer at how it is designed. But the analogue output section is enclosed in black boxes, like what La Rosita does. So I don't have any clue what it is inside. But I'm sure that inside the black box there must be the discrete circuit, which I believe will guarantee excellent sound. On the upper circuit, the R2R Ladder is aligned in four lines, each channel using two lines. Each line has twenty-four rows. So I know that it is a 24 bit R2R Ladder DAC. All the resistors are Vishay PG foil naked (VAR) 0.01% super precision resistors. As for the USB input, it is equipped with asynchronous XMOS chip. Beside the DAC, we can see the Lattice XP2 series FPGA use to perform digital filtering and buffering, a very thoughtful design. From D1 external equipped power supply, we can see Vincent Brient non tolerant attitude for digital noise, moreover, when you choose one digital input, the other digital inputs will be turned off automatically. Of

course, the OLED screen can be turned off to further reduce noise floor.

Don't improve only the source

If you think that all can be done about digital playback is done, then you're wrong. There is also issue about jitter. How did Vincent Brient deal with jitter? He didn't use external clock to solve the jitter problem, but use FPGA to be buffer memory, using first in first out (FIFO) to store about 10ms of audio data. The British digital master, Meridian, used the same method to solve the jitter problem. Reference D1 is improved version and successor of Reference A1. A1 doesn't have XLR output, beside that D1 has Single and Dual versions. In the Single version, single DAC set are used for stereo channel, while in the Dual version, single DAC set are used per single channel, which makes it a true balance design. Vincent also mentioned some other ways to improve your sound after you got a D1 DAC. These



A. Gold : Expressive, lively, open
B. Wood : Warm, contained, affinity
C. Water : Silky, natural, smooth
D. Fire : Fast, passionate, impact
E. Earth : Bold, full, firm

Highlights

1. One of the very few units on the market that use 24bits R2R Ladder DAC converting methods, which produces transparent, natural, and further possesses ultra realistic tones.
2. Radiant and full, sharp contours, powerful and lively.
3. Extremely high resolution and rich in detail.

Recommendations

1. For the more sophisticated result, you can refer to the original manufacturer's recommendation by adding a digital electronic crossover system.
2. Please do make use of a balanced output system.
3. Please make use of amplifiers and speakers that can complement the D1's rich, dynamic and detailed system

methods are: 1. using bi-wire 2. using bi-amp 3. using an analog active crossover 4. using a digital active crossover 5.using a digital active crossover integrated in the Totaldac DAC. The main idea is to let each amplifier drive each unit of your speaker. The closer you get to this goal, the better sound you can get. Therefore, Totaldac also offers DAC with digital active crossover version. D2 is a DAC with two way active crossover, while D3 with three way active crossover.

So Transparent, So Rich, So Dulcet

First, I tried to listen to the *Sarah McLachlan/Surfacing*, the sound played by the Totaldac justified the title of the album. In this album, I



Appearance

D1's interior components look disproportionately complex compared to its simplicity design of external outlook, however the designer put a lot of effort into designing the side panel so that it appears slanted, at the same time only an OLED screen is present on the panel, not one button is in sight, it is quite unique among other DAC products.

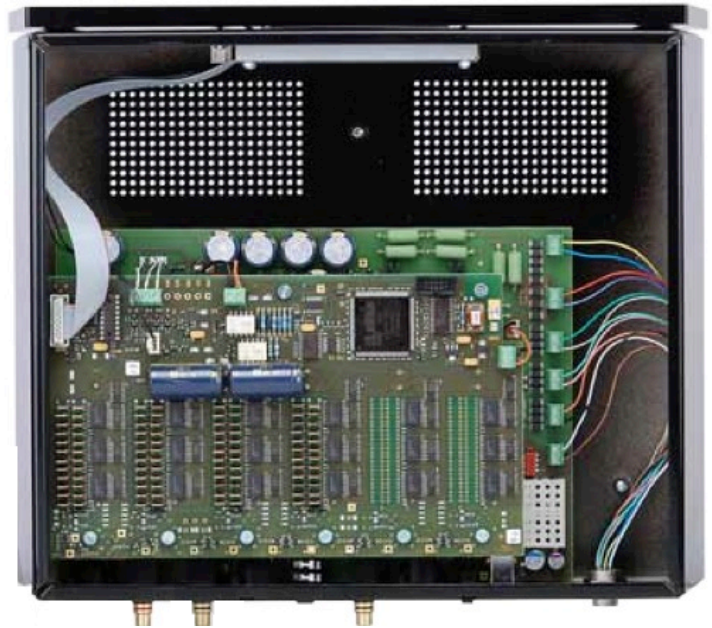


Rear Side

Since it is chosen to have the totally balanced version (DUAL), it is clear that only the balanced terminal can fully unleash the D1's full capabilities, the original manufacturer also recommends users to take this path, however, shall you not be in the possession of a balanced terminal, they have an unbalanced to balanced converter option.

Interior

Since it utilized an external power supply, there is no power transformer within the D1. The electric circuits are divided into two layers, the upper layer is the discrete R2R Ladder DAC core, while the lower layer is the input and analog output terminal, the analog output also utilizes discrete components, not the Operational Amplifier IC.



I heard the transparency that beyond my expectation. The instruments mixed into the song by the sound engineer were just materialized in front of you. It was so real, natural, and effortless. Due to the high transparency, it cast a realistic wide open three dimensional soundstage. The sound of guitar bloomed with crispy and fullness quality, pronouncing authority and impact of the playing. Why I described Totaldac as a rich DAC, I meant on one hand, it demonstrated an excellent sound texture, and on the other hand, it has abundant in details. Listening to the latest Grammy Award winner, *Adele/Rolling in the Deep* from the Album 21, I heard the texture richness in the crescendo just at the beginning of the song. The drums following is strong and powerful, Adele's

voice is bathed with charisma, and I could even hear the detail and the spectral ambience infused by mixing engineer which I had never heard before. The music played with D1 won't remind me of anything about harsh, cold, sharp, brittleness of the so-called digital sound, instead, it demonstrated a very natural lively rhythm. Both in *Houston Person/Together At Christmas* (HighNote HCD7058) and in *Art Pepper/Meets the Rhythm Section*, the sax sounded so real and full that make you just cannot turn away from that sonic bliss.

Capable of handling big occasion

Given that D-1 can play high resolution files through UBS, I picked the DAD version of *Lorna Hunt/All in one day* and played through the DVD-ROM of the

computer. The CD version and the high resolution DAD version made such a big difference. Listening to Lorna's voice with her acoustic guitar, accompanied by double bass, drums, resonator, and accordion, I was immersed in the live atmosphere, the transparency of reverberation, and the naturalness of the sound produced by each instrument. All of these aspects showed how excellent a DAC D1 is. In *Piece of My Heart*, the combination of voice and sound of each kind of instrument is intertwined as colorful fabric. The unpolished quality of the live recording was truthfully captured. In *Don't Know Much*, the duet of Aaron Neville and Linda Ronstadt were full of exquisite quality. Their resonant voices are so soft and pleasant. Linda Ronstadt showed her splendid and bright voice when she reached to the high-pitched notes. The duet of Ronstadt and Neville was so intoxicating that you

just can't resist the immersion into their voices

Finally, I played Beethoven Symphony No.9 (DG 002894775869) by Abbado conducting Berlin Philharmonic Orchestra. The micro-dynamic of the orchestra was so discernible, especially the vibration of the group of strings playing in *pianissimo*. However, when the orchestra played the *tutti*, the instant burst of the energy seemed no limitation, resulting in tremendous momentum; therefore, I realized how versatile a DAC the

D1 was. Each instrument had its body and pinpoint position, and no blurring indistinctness among the choirs and instruments.

Excellent Musicality

The most biggest impression for me is that D1 can handle every kind of music excellently. For classical music, D1 can be tremendous. For pop music, D1 can show some punch. For jazz, D1 shows you the dense ambience. D1 is just like colorful Macarons. If you ever tasted high-quality Macaron, you will

understand the rich tastes of the mixing up numerous natural ingredients. Macaron is a classic French dessert. But after you taste it, you would know the indispensability of the complicated procedures of making Macaron. Totaldac, which Vincent took a long time to build with its discreet R2R construction, is just like Macaron. The combination of crispy taste and fragrance of Macaron is just like the ideal combination of musicality and hi-fi presented by Totaldac Reference D1 Dual.

