

Introducing SMSL VMV Digital PFFB Amplifier Technology

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Introduction

The audiophile's choice: Class D? Class A or A/B?

Class D amplifier uses a PWM controlled voltage generator to produce the output. This is very different from the continuous analog Class A or A/B. Class D advantages include high efficiency, compact size, and low heat dissipation compared to traditional Class A and A/B amplifier designs. The result is a broad application of Class D amplifiers in modern products such as AV-R's, soundbars, and speakers.

However, despite technical advances over traditional amplifiers, lingering technical limitations to audio fidelity draw objections from audiophiles who pursue a flawless, high-fidelity sound.

This page explores the current state of Class D amplifiers and highlights how SMSL raises the bar with its new Digital PFFC Amplifier technology.

The Shortcomings of Class-D

The distortion

The cause of Class-d amplifier distortion always by this 4 points:

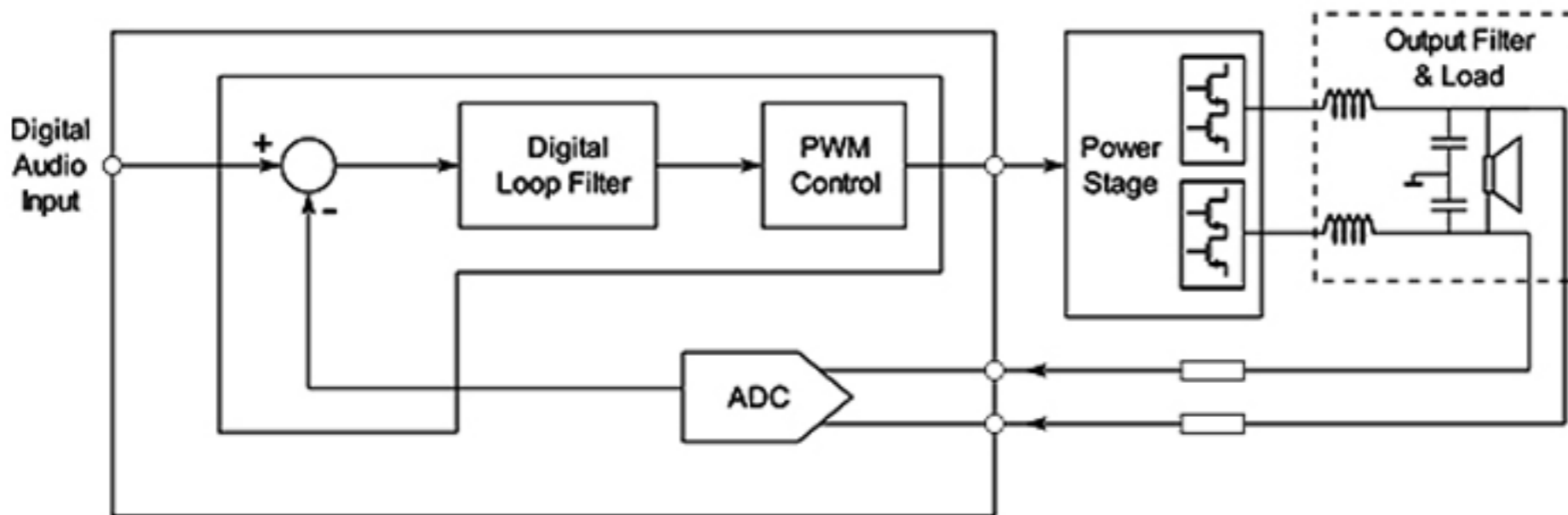
1. Output filter load dependency over audio frequency
2. Power stage dead time
3. Supply voltage ripple
4. Analog feedback loop limitations

Each of these factors increase amplifier non linearity, unnatural sharp-sounding distortion, and noise. This reduces the sound fidelity, stereo imaging, and subtlety of any audio performance.

Introducing SMSL Digital PFFB Amplifier Technology

To address these shortcomings of Class-D to great sound, introduces Digital PFFB Amplifier technology. With PFFB, feedback is taken across the speaker terminals, after the output filter. As a result, the feedback accurately reflects how the wired speakers' impedance is affecting the amplifier's sound—this is then compared with the input signal and corrected in real-time. The result is a digital amplifier that exactly reproduces the desired output signal for any type of wired loudspeaker, no matter the impedance.

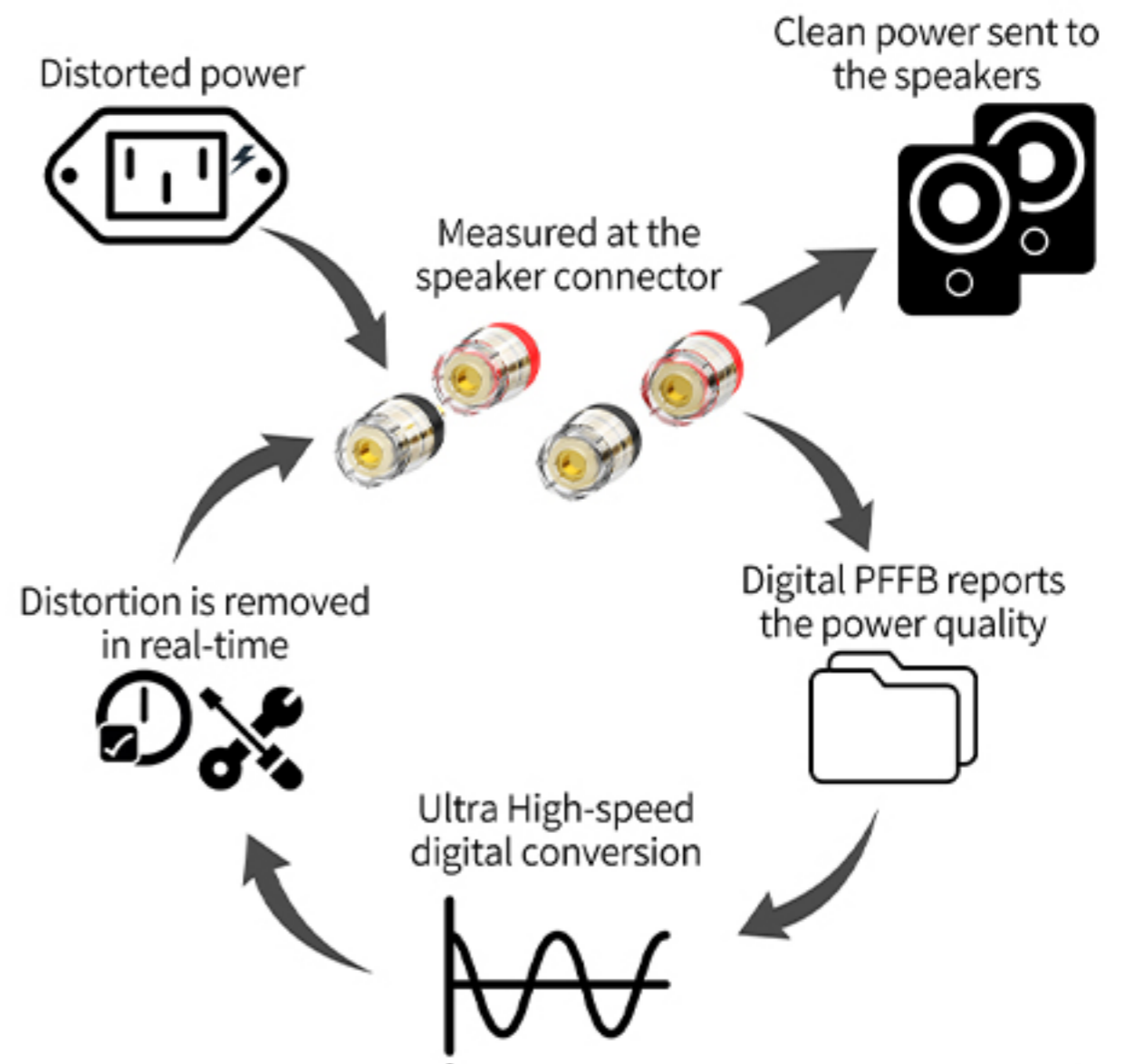
Typical Application Diagram



VMV A2 Creating two solution for Class D shortcomings requires deep innovation.

The key breakthrough is an ultra-fast, low-latency analog-to-digital conversion (ADC) of the analog output signal from the speaker terminals back into the digital control loop. The Digital PFFB can achieve speeds of 20 nanoseconds. The result is that the feedback can accurately enter the digital domain and correct any differences from the audio input signal – throughout the entire audio band. At the same time, VMV A2 using revolutionary digital input and passes through ADC, which is not limited by ADC, that made signal integrity.

The employing high loop gain without compromising amplifier stability. Typical analog amplifier feedback systems can only obtain a low loop gain before experiencing stability issues. Low loop gain weakens the effectiveness of the feedback loop’s distortion and noise-suppression. However, PFFB uses a high digital loop gain that is typically 100 times higher than other amplifiers, without a drop inside the audio band. The effect is that the feedback loop is more effective at cleaning the distortions and restoring the sound to its proper form.

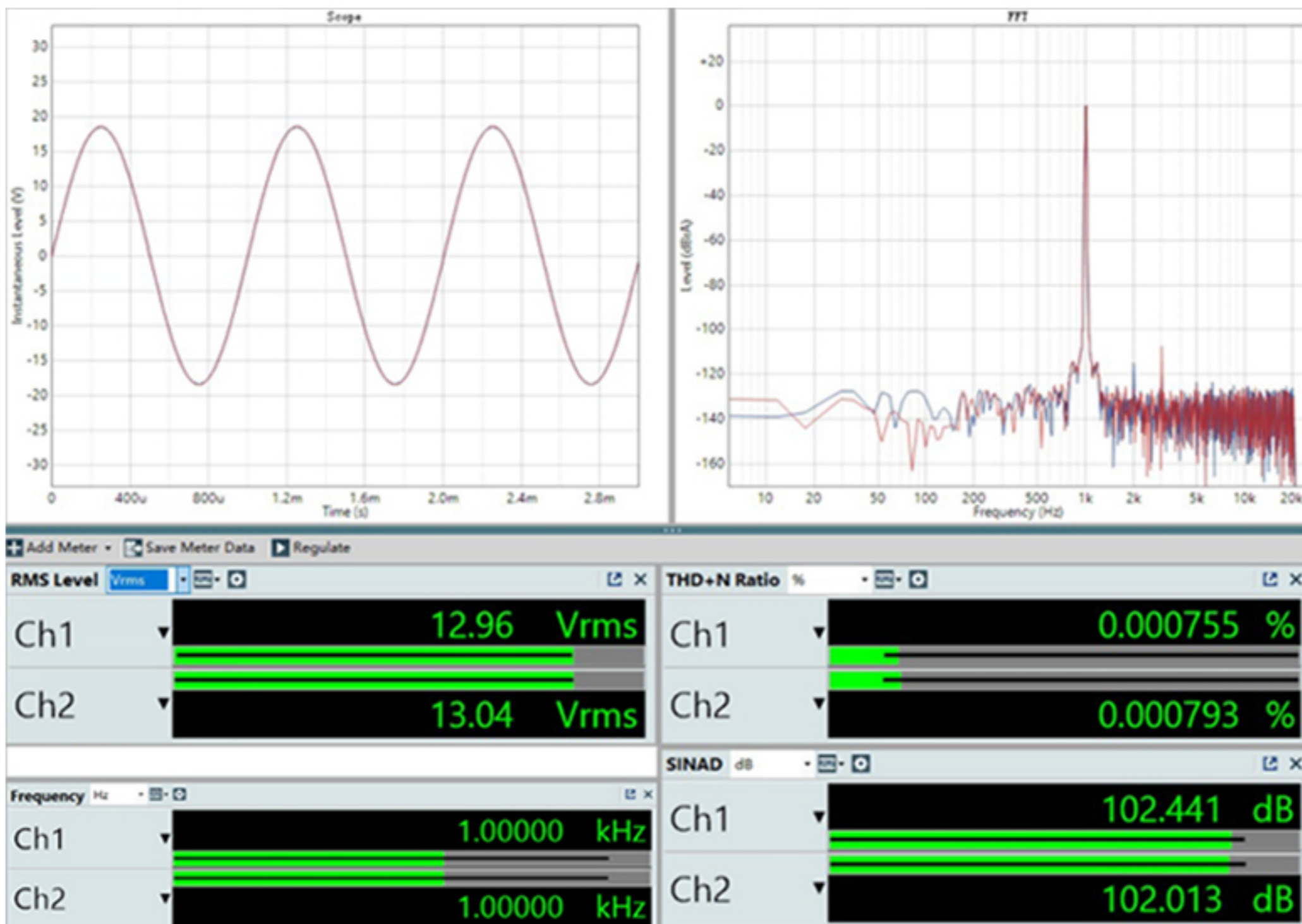


Balanced: Minimalist timeless design to meet Multi-demand

VMV A2 use revolutionary Digital PFFB Class D amplification technology - using digital input and passes through ADC, which is not limited by ADC, and at the same time uses excellent power supply to avoid the shortcomings of traditional amplifiers.

VMV A2 only 28×25×4.3cm(11×9×1.6in), but max power match 200W to run any large floor speaker easily. Load-invariant frequency response and negligible output impedance, which made A2 handles difficult loudspeakers with ease, including those that challenge most other amplifiers. This gives A2 more possibilities.

THD remains extremely low at any frequency and any power level right until clipping. Translates into a total lack of sonic signature, and an ability to reproduce any type of music without preference for genres or production style.



Until SMSL changed the game, Class D amplification was only about compactness and electrical efficiency - but VMV A2 also offers obvious superiority where clarity, resolution and outright musicality are concerned. That is what makes A2 an enjoyable and convincing listen.

Amplifier feature	Standard Class-D Amps		Other direct digital feedback	Digital PFFB
	Analog-in	Digital-in	Digital-in	Digital-in
Feedback across the loudspeaker connectors	✗	✗	✗	✓
Ultra high-speed ADC in the feedback loop	✗	✗	✗	✓
4 Ω, 8 Ω, open load independent frequency response	✗	✗	✗	✓
High order Digital Feedback Loop, flat low THD+N over the entire audio bandwidth (related to clear sound quality)	✗	✗	✓	✓
No Inter Modulation Distortion (related to defined sound quality)	✗	✗	✓	✓
No audible Pop Sound	✗	✗	✓	✓
Digital input (no loss of dynamic range at the input)	✗ DAC required	✓	✓	✓
Dynamic Range (related to low noise on set-level)	97 dB-A	105 dB-A	111 dB-A	118 dB-A
THD+N @ 10 W / 8 Ω / 6 kHz	0.1%	0.1%	0.005%	0.0018%
THD+N @ 10 W / 8 Ω / 1 kHz	0.05%	0.03%	0.003%	0.0007%