

D2Audio® DAE-1: D2-814xx PWM Controllers


The World's First Intelligent Digital Amplifier Solution

The **DAE-1 Digital Audio Engine™** is the world's first Intelligent Digital Amplifier™, combining the superb audio processing of an on-chip DSP with a powerful adaptive Class-D PWM control engine. The 4 self-contained PWM controllers can be used in a variety of configurations, from Bi-Amp Stereo solutions up to 4 independent channels. The inner-chip communication interface allows two or more DAE-1 devices to work in tandem, supporting 5.1 to 7.1 AVRs as well as 8 channel and higher multi-room audio amplifiers.

Advanced Sample Rate Converters (SRCs) are used on every channel to deliver the very best audio performance with SNR as high as 114dB and 0.05% THD+N. The combination of adaptive PWM controllers and independent SRCs deliver 55dB better THD+N than competing solutions.

Other Class-D amplifiers suffer from inherent architectural problems, but D2Audio has developed significant intellectual property to address these weaknesses. The result is an All-Digital amplifier that truly delivers an audiophile quality, with a sweet sound that simply must be heard. The exceptional D2Audio performance quality is backed up with definitive quality measurements, as well as by a growing and highly respected customer base.

Key Features Include:

- Patented Output Stage Compensation and Optimization Enables Incredible Performance from a Wide Range of Drivers/Level Shifters and FETs
- Integrated 192kHz S/PDIF Receiver and Multichannel I2S I/O support seamless HDMI® connection as well A/V Sync capability
-  D2Audio SoundSuite™ **HDTV** processing optimizes speaker performance adding value



Extensive 3rd Party Algorithm Support:

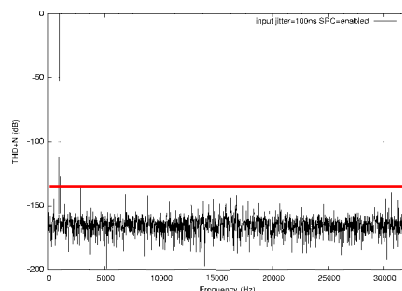


EmbracingSound™

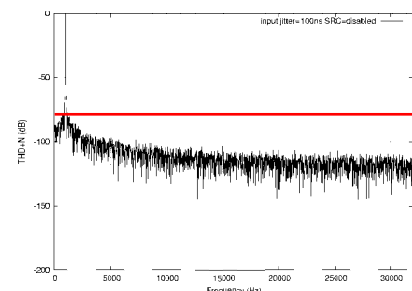


Integrated Sample Rate Conversion on Every Input Removes Digital Audio Jitter:

- The advanced SRCs of the DAE-1 accepts multiple totally independent (related or unrelated) audio sampling frequencies. This enables seamless integration with DVD-Audio data which support grouping of various output sampling frequencies (e.g. L/R at 96 kHz, Ls/Rs/C/Sub at 48 kHz).
- With other PWM Controllers, the system microcontroller is responsible for downloading new coefficient sets every time a sampling frequency changes. With the D2Audio PWM Processor, this is no longer a concern, reducing critical time on microcontroller overhead, programming & coefficient generation.
- Over 55dB of THD+N performance improvement over other digital amplifier ICs, regardless of input jitter or sampling frequency, as can be seen below.



Noise Floor with D2Audio PWM Processor (100nS Input Jitter)

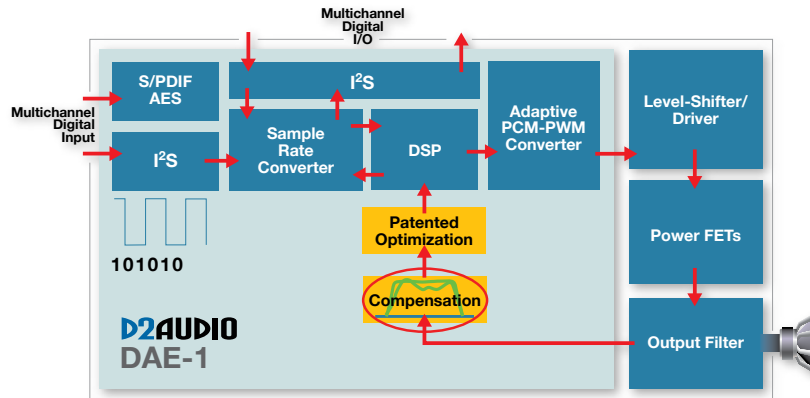


Noise Floor with Typical PWM Controller (100nS Input Jitter)

D2-PS-814xx-140

D2Audio® DAE-1: D2-814xx PWM Controllers

As the top performing PWM Controller available today, all of the intelligence of DAE-1 is folded into the controller, not the power stage. This enables the same DAE-1 controller to be placed into amplifier reference designs which range from 15W/Channel up to 600W/Channel and vary from 1 to 24 Channels. The DAE-1 has been designed into numerous, production-grade, end-product tested, reference design platform (RDP) packages that are available today. All of the performance of the MXR125-7, the compactness of the TXS25-2, and the versatility of the MXS100-2, and the cost effectiveness of the TXF15-2, are all now available to you, for high-volume amplifier applications.



Complete Class-D Amplifier Controller SOC

- Advanced Digital Audio Engine-1 (DAE-1)TM
- 4 Channel Digital Switching Controller
- Flexible Audio Input Sources
- Multiple Controller Synchronization Bus
- Supports Bridged and Non-Bridged Topologies
- Stand-Alone (EEPROM) or Microcontroller Boot Capability

High-Performance Sound

- World's ONLY Digital Amplifier Controller IC / Complete Amplifier Design capable of meeting the criteria for THX[®] Ultra2TM amplification performance levels (XRT125-7 Module)
- 114 dB SNR/Dynamic Range
- Less than 0.05% THD+N, 100W, 20Hz - 20kHz, 8 Ohm (MXR125-7 Reference Design Platform)
- +/-0.5dB Frequency Response, 20Hz ~ 20kHz, 8 Ohm (MXR125-7 Reference Design Platform)

Graceful Protection and Recovery

- Complete short-circuit, over-current, and over-voltage fault protection

Support for both D2Audio & the latest 3rd Party Algorithms

- D2Audio SoundSuite[™] (ARMC, Acoustic Speaker Detect, Speaker Distance, Speaker Polarity, Speaker Size, Sound Pressure Level Normalization, Mono2Stereo, WideSound, DeepBass, AudioAlign, DigitalEQ)
- Dolby[®] Virtual Speaker, SRS[®] TruSurround HD/HD4, EmbracingSound[™]

D2Audio DAE-1 Reference Design Platform (RDP) Package & Processing Firmware Offering

| RDP Package / Eval Kit Family Name | DAE-1 P/N, Pin Count | Channels of Amplification | Rated Power/Channel | Supported Application Configurations | Processing Firmware Available for the DAE-1*** |
|------------------------------------|---|---------------------------|---------------------|--------------------------------------|---|
| MXS100-2 | D2-81412-LR, 144-pin | 2 | 100W (8Ω) | 2.0, Bi-Amp, 2.1 | Baseline |
| MXS50-2 | D2-81412-LR, 144-pin | 2 | 50W (8Ω) | 2.0, Bi-Amp, 2.1 | Baseline |
| MXR125-5/6/7 | D2-81412-LR, 144-pin | 5, 6, 7 | 100W (8Ω) | 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 | Baseline, D2Audio SoundSuite [™] LEO Complete (ARMC, Acoustic Speaker Detect, Speaker Distance, Speaker Polarity, Speaker Size, Sound Pressure Level Normalization) |
| MXM100-6/8 | D2-81412-LR, 144-pin | 6, 8 | 50W (8Ω) | 6.0, 8.0 | Baseline, EmbracingSound [™] |
| RXR75-7 | D2-81412-LR, 144-pin | 5, 6, 7 | 75W (8Ω) | 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 | Baseline, D2Audio SoundSuite [™] LEO Complete |
| TXD25-2 | D2-81433-LR, 128-pin | 2 | 25W (8Ω) | 2.0, 2.1 | D2Audio SoundSuite [™] HDTV (Mono2Stereo, WideSound, DeepBass, AudioAlign, DigitalEQ) |
| TXF15-2 | D2-81433-LR, 128-pin | 2, 4 | 15W (8Ω) | 2.0, 2.0 Bi-Amp, 2.1, 3.0, 3.1, 4.0 | D2Audio SoundSuite [™] HDTV |
| TXS25-2 | D2-81412-LR, 144-pin | 2 | 25W (8Ω) | 2.0 | Baseline, D2Audio SoundSuite [™] HDTV |
| TXS25-4 | D2-81412-LR, 144-pin & D2-81433-LR, 128-pin | 2, 3, 4 | 25W (8Ω) | 2.0 Bi-Amp, 2.1, 3.0 | Baseline, D2Audio SoundSuite [™] HDTV, EmbracingSound[™] |
| XVIR40-2* | D2-8143x-LR, 128-pin** | 2, 3 | 40W x 2 (4Ω) | 2.0, 2.1 | D2Audio SoundSuite [™] HDTV, Dolby[®] Virtual Speaker (Reference Mode, Wide Mode, 5.1 Channel Input, Bass Management) |
| XVIR20-4* | D2-8143x-LR, 128-pin** | 2, 3, 4 | 20W x 4 (4Ω) | 2.0, 2.1, 3.0, 3.1, 4.0, 4.1 | D2Audio SoundSuite [™] HDTV, SRS[®] TruSurround HD/HD4[™] (WOW HD, Definition, Dialog Clarity, Headphone, 6.1 Channel Input, Bass Management) |
| WX5600-1 | D2-81412-LR, 144-pin | 1 | 600W (4Ω) | 0.1, 2.1 | Baseline, SoundSuite [™] LEO Sub (ARMC) |
| XPC100-5 | D2-81433-LR, 128-pin | 5 | 100W (8Ω) | 5.0, 5.1 | Baseline, SoundSuite [™] LEO XPC (ARMC, Acoustic Speaker Detect) |
| XPC100-7 | D2-81433-LR, 128-pin | 3, 4, 5, 6, 7 | 100W (8Ω) | 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 | Baseline, SoundSuite [™] LEO XPC (ARMC, Acoustic Speaker Detect) |

*Please specify which IC when ordering the XVIR40-2 or XVIR20-4 Evaluation Kit. **D2Audio is obliged to confirm that NDAs and/or Evaluation Sample Licenses are in place with all 3rd Party IP Owners and potential D2Audio customers before the sale of an evaluation kit which contains either a D2-81434-LR or D2-81435-LR. Sale of the D2-81434-LR is only available to Dolby Laboratories licensees in good standing. Sale of the D2-81435-LR is only available to SRS Labs licensees in good standing. ***Delivery of 3rd party Firmware is subject to prior confirmation with the 3rd party IP vendors that the OEM/ODM/ Customer is currently in good standing and have the appropriate licenses in place for the respective technology. TruSurround HD and TruSurround HD4 are trademarks of SRS Labs, Inc. Dolby and the Double-D symbol are registered trademarks of Dolby Laboratories. EmbracingSound is a trademark of Embracing Sound Experience AB. THX is a registered trademark of THX Ltd. HDMI is a registered trademark of HDMI Licensing LLC.



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