

## 2 x 150 W Digital & Analog Input Closed-Loop Class-D Audio Amplifier with Audio DSP

### Features

- Digital and / or Analog Input Signal
  - Supports I<sup>2</sup>S, LJ, RJ, **TDM**, IOM-2 digital audio format inputs
  - Automatic 32 fs / 64 fs detection
  - Hardware sample rate converters (no pop-up noise by input sample rate change)
  - 8 kHz to 192 kHz sample rate support
  - Stereo analog inputs with AFE and 24-bit ADC
  - Programmable PGA gain setting (0.75dB Step)
  - Noise gate / ALC ADC function / digital volume
  - Stereo ECM / analog - MEMS / digital - MEMS micro phone interface
  - **Fine volume control (0.125 dB steps)**
  - Supports 3.4 MHz I<sup>2</sup>C interface for quick initial setup
  - **I<sup>2</sup>C address control**
- Digital Signal Processing
  - Input signal mixer
  - Low power digital signal processing circuits
  - Soft mute / soft digital volume
  - 15 x 2-ch. parametric equalizers
  - Intelligent bass boost
  - Limiter and compressor
  - Multi-band DRC
  - PEQ L/R mixer function
  - Power meter
  - Special audio DSP configuration mode
- Single Chip Power Stages
  - 150 W x 2-ch. maximum audio output powers
  - Closed-loop class-D amplifier with DSP
  - 2-ch. or paralleled 1-ch. configuration
  - Two-way mono configuration with professional active crossover filters
  - Possible drive for 4 Ω loads
  - Output LC filter-less operation with internal analog feedback loop
  - Smart pulse-by-pulse current regulation to prevent shutdown at low impedance frequency point
  - THD+N < 0.02% at 1 W, 1 kHz

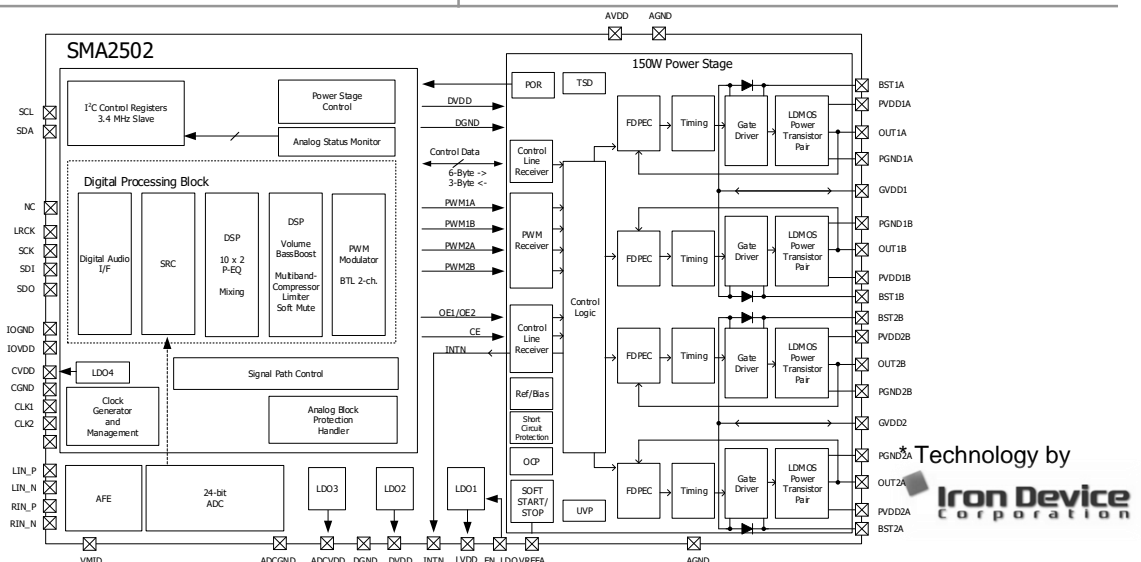
- SNR 102 dB
- N+N power DMOS output stage
- Separated power stage power supplies for less cross-talk (inter-channel)
- Smart Analog Protections
  - Thermal protection and warning state feedback
  - Undervoltage protection (UVP) for all power supplies
  - Over current protection
  - Short circuit protection: output-to-output, output-to-ground, output-to-power
  - **Initial pin to power short circuit protection (IPSC)**
  - Interrupt signal output pin
  - Fault diagnostics by I<sup>2</sup>C status register reading
- Internal Power Management Circuits
  - Programmable internal LDOs
  - Power down controls for each analog and digital block
  - Boost converter control output pin for **feed-forward processing (optional feature)**
- Clock Management Circuits
  - Internal stand-alone oscillator with self-calibration
  - TCXO clock interface
  - Crystal oscillator circuit
  - High performance clock generator (low jitter fractional-N PLL)

### Applications

- BT Speakers, Smart Hubs
- Sound Bars, Digital TVs
- Digital Set Top Boxes
- Car A/V Systems

### Device Information

Part Number	Package	Body Size
SMA2502-F	64 - QFN	9.0 mm x 9.0 mm
SMA2502-T	48 - HSSOP (T)	6.1 mm x 12.5 mm



# **SMA2502**

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## ***Description***

This document contains detailed target specifications for a full digital audio amplifier with switching mode four half-bridge power stages. SMA2502 is a high performance monolithic full digital amplifier with **both digital and analog** audio input ports. Equipped with a rich set of digital signal processing functions, it can be used for digital signal inputs. The maximum audio output power is 150 W RMS per channel.