

## 2 x 50 W Digital Input Closed-Loop Class-D Audio Amplifier with Audio DSP

### Features

- Digital Input Signal
  - Supports I<sup>2</sup>S, LJ, RJ, TDM 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
  - 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
  - 2-ch. x 50 W maximum audio output powers
  - Closed-loop class-D amplifier with DSP
  - 2-ch., 2.1-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 < 0.01% at 1 W, 1 kHz
  - SNR 110 dB
  - N+N power DMOS output stage
  - Separated power stage power supplies for less cross-talk (inter-channel)

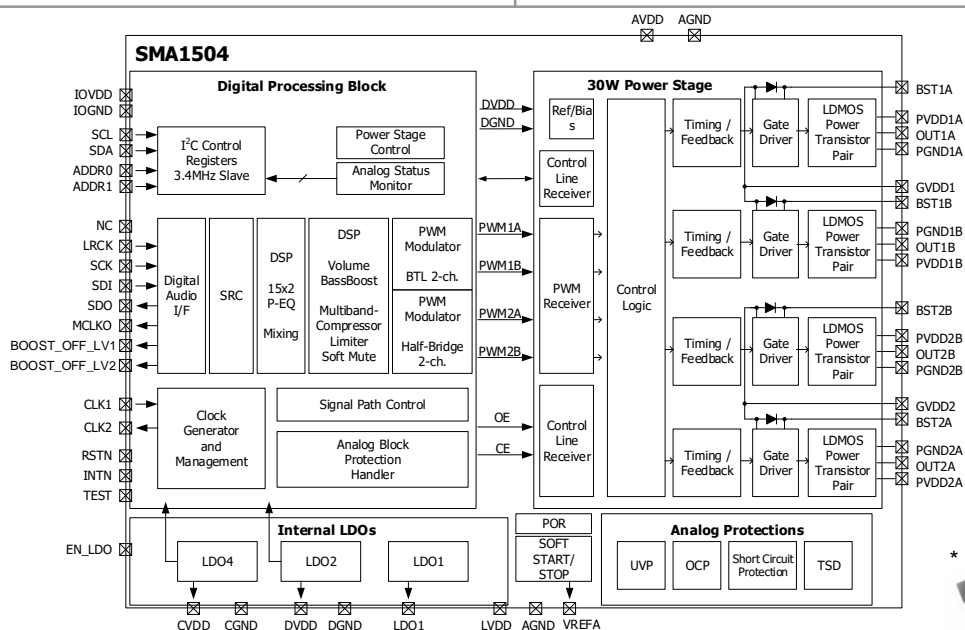
- Soft start and soft stop function for half-bridge pop-up controls
- Smart Analog Protections
  - Thermal protection and warning state feedback
  - Under voltage protection (UVP) for all power supplies
  - Over current protection
  - Short circuit protection: output-to-output, output-to-ground, output-to-power
  - Interrupt signal output pin
  - Fault diagnostics by I<sup>2</sup>C status register reading
- Internal Power Management Circuits
  - Programmable internal LDOs (DVDD, CVDD, LDO1)
  - Power down controls for each analog and digital block
  - Boost converter control output pin for feed-forward (three steps)
- 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
SMA1504-F	48 - QFN	6.0 mm x 6.0 mm
SMA1504-T	48 - HSSOP (T)	6.1 mm x 12.5 mm
SMA1504-U	48 - HSSOP (B)	6.1 mm x 12.5 mm



\* Technology by  
**Iron Device Corporation**

## ***Description***

This document contains detailed target specifications for a full digital audio amplifier with switching mode four half-bridge power stages. SMA1504 is a high performance monolithic full digital amplifier with digital audio input ports. Equipped a rich set of digital signal processing functions, it can be used for digital signal inputs. The maximum audio output power is 50 W RMS per channel.