

2 x 30 W Digital & Analog Input Closed-Loop Class-D Audio Amplifier with Audio DSP

Features

- Digital and / or Analog Input Signal
 - Supports I²S, LJ, RJ, PCM and 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 (0.75 dB step)
 - Noise gate, ALC ADC function, digital volume
 - Stereo ECM, analog-MEMS, digital-MEMS microphone interface
 - Supports 3.4 MHz I²C interface for quick initial setup
- Digital Signal Processing
 - Input signal mixer
 - Low power digital signal processing circuits
 - Soft mute / soft digital volume
 - 10 x 2-ch. parametric equalizers
 - Intelligent bass boost
 - Limiter and compressor
 - Multi-Band DRC
- Single Chip Power Stages
 - 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 < 0.02% at 1 W, 1 kHz
 - SNR 102 dB
 - Half-bridge soft-start for pop-noise reduction
 - N+N power DMOS output stage
 - Separated power stage power supplies for less cross-

talk (inter-channel)

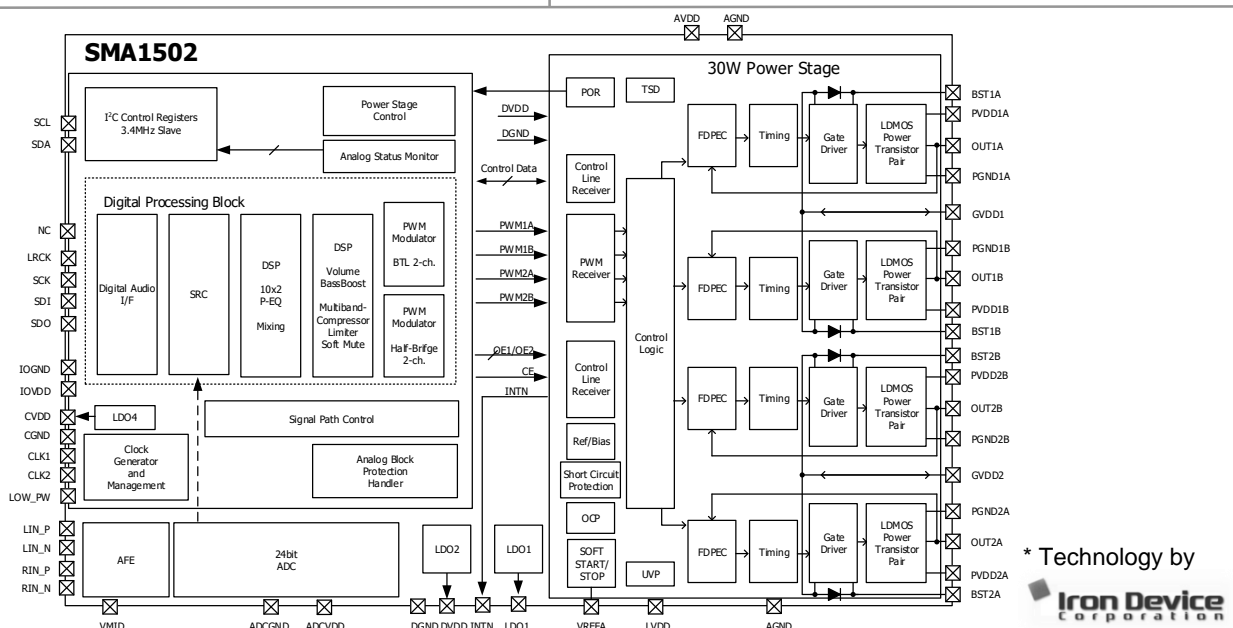
- Soft start and soft stop function for half-bridge pop-up controls
- Smart Analog Protections
 - Thermal protection and warning state feedback
 - Undervoltage protection (UVP) for all power supplies
 - Over current protection
 - Short circuit protection: output-to-output, output-to-ground, output-to-power
 - Interrupt signal output pin
 - Fault diagnostics by I²C status register reading
 - HBM 4 kV ESD for speaker connection pin
- Internal Power Management Circuits
 - Programmable four 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/AI Speakers, Digital Set Top Boxes
- Smart Hubs, Sound Bars, Digital TVs
- Car A/V Systems

Device Information

Part Number	Package	Body Size
SMA1502-F	48 - QFN	6.0 mm x 6.0 mm



* Technology by
Iron Device Corporation

SMA1502

Description

This document contains detailed target specifications for a full digital audio amplifier with switching mode four half-bridge power stages. SMA1502 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 and / or analog signal inputs. The maximum audio output power is 30 W RMS per channel.

SMA1502

Figure 1. 2.1 Channel Schematic