

# Smart Amplifier NAU83G10/G20 with KLIPPEL Controlled Sound (KCS)



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KLIPPEL is excited to announce that our cooperation partner Nuvoton is going to release a new breed of smart amplifier with integrated KLIPPEL Control Sound (KCS) technology based on nonlinear speaker model.

Nuvoton Technology Corp., a leading worldwide provider of consumer-electronics and computer ICs, developed the highly efficient mono Class D audio amplifier device, NAU83G10 and NAU83G20, with our adaptive nonlinear control system.



Both NAU83G10 and NAU83G20 devices have on-chip and low latency Tensilica HiFi Audio DSP, a high quality 24bit audio ADCs for current and voltage sense, and a battery tracking and brownout prevention ALC which are optimized for Klippel Controlled Sound (KCS) technology.

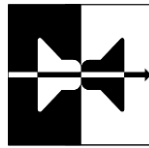
## KEY HARDWARE FEATURES

- Ultra-Low-Noise and yet Powerful Mono Boost Class D Amp
  - 12W Output Power @ 4Ω Load, <10% THD+N, 5V Battery for NAU83G10
  - 20W Output Power @ 4Ω Load, <10% THD+N, 12.6V external supply for NAU83G20
  - Low Output Noise in Receiver Mode: 12  $\mu\text{V}_{\text{RMS}}$  for NAU83G10
  - Highly adaptive Class-H Boost Converter with Multi Level Tracking for NAU83G10
  - Over 92dB Power Supply Rejection Ratio (PSRR)

The NAU83G10 operates with analog supply voltages from 1.6V to 1.98V, while the battery supply voltage can operate from 2.9V to 5.5V (NAU83G20 can operate up to 14V). The operating temperature range is for both specified from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , and it is available in CSP 50 Ball package with a 0.5mm pitch.

## KEY SOFTWARE FEATURES

- Unique KCS Software for Improving Speaker Performance
  - Adaptive, nonlinear control to generate more sound pressure output
  - Predictive speaker protection against thermal / mechanical overload
  - Adaptive compensation of varying speaker parameters
  - Automatic speaker equalization to a desired bass response
  - On-line speaker diagnostics to improve product reliability



The adaptive, nonlinear control system cancels the DC displacement, harmonic and intermodulation distortion generated by speaker nonlinearities (THD, IMD). Furthermore, the KCS operates the voice coil at the optimum rest position without mechanical sensor and compensates for speaker parameter variation due to aging and climate changes. The new hardware and software capabilities in the NAU83G10 and NAU83G20 allow to safely operate smaller speakers at the physical limits to generate more acoustical output at higher sound quality while providing reliable protection against thermal and mechanical overload compared to conventional linear algorithms.

“We are very excited to be working with Klippel on creating this new breed of smart amp devices, which can deliver maximum output at unparalleled sound quality from smaller speakers, offer a precise speaker protection, provide a real time speaker diagnostic data, simplify the speaker tuning process, and increase the barge-in AEC performance compared to conventional linear model base smart amplifier” said Aditya Raina, president of audio product business group at Nuvoton Technology Corporation America.

NAU83G10 and NAU83G20 engineering samples and evaluation systems are available now through all Nuvoton sales channels. More information on [www.nuvoton.com](http://www.nuvoton.com) or [www.klippel.de](http://www.klippel.de).

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