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Radio TechCheck



The Weekly NAB Newsletter for Radio Broadcast Engineers

New Algorithm Improves Micro Speaker Audio Quality

More and more portable devices utilize micro-sized speakers to deliver audio to consumers. In July, [NXP Semiconductors](#) N. V. (The Netherlands) announced a new, embedded algorithm as part of a new audio system which, according to NXP, will boost the output power of micro speakers by over 5 times, vastly improving the sound quality of mobile devices. By driving over 2.6 watts RMS into micro speakers that have previously been limited to 0.5 W, the [NXP TFA9887](#) IC will give mobile phones, portable music players and tablets much louder sound, deeper bass, and higher sound quality – without risking speaker damage.

With a unique combination of safety features including adaptive excursion control and real-time temperature protection, the TFA9887 monitors speakers through a current-sensing amplifier and enables safe operation while working at near peak output at all times. The figure depicts this capability, illustrating how the algorithms in the TFA9887 increase the density of the audio signal while at the same time limiting peak excursions.

Speaker makers have to balance competing demands for good sound, small size and reliability. As micro speakers have shrunk, phone, media player and tablet designers have been forced to limit output power and sound quality. Amplifiers could easily deliver enough power to destroy the speaker at one frequency, while under-powering it at others.

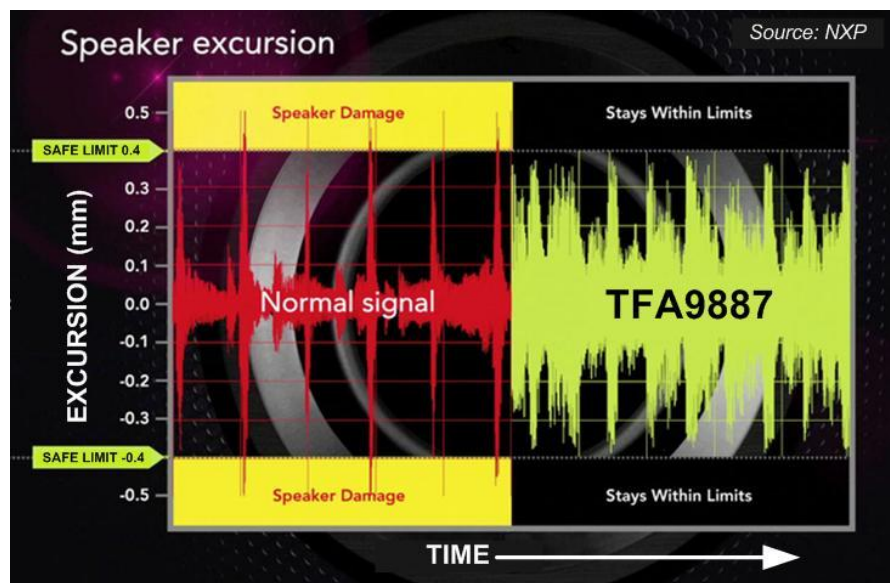
Until now, it has been more difficult for system designers to know when it was safe to apply extra power. The rule has therefore been to cut out bass frequencies and limit output power to avoid blowing the speaker – a common cause of failures in mobiles.

By incorporating circuits that monitor speaker performance and prevent damage, the NXP TFA9887 IC allows designers to break this rule.

Adaptive excursion control measures the actual excursion of the speaker membrane to ensure that it never exceeds its rated limit. Real-time temperature protection measures the voice-coil temperature directly to prevent thermal damage.

Further, because the speaker is fully protected, the system can deliver significant levels of extra power to make the sound louder and better than before. The TFA9887 optimizes the audio signal based on the movement of the speaker, using the full capabilities of the speaker without pushing beyond the limits. An advanced clip avoidance algorithm monitors audio performance and prevents clipping, even when the power supply begins to sag. Bandwidth extension increases the low frequency response well below speaker resonance. And an intelligent DC-to-DC boost converter maximizes audio headroom from any supply level despite battery undervoltage. The TFA9887 automatically adapts to any changes in the speaker – including ageing, damage to the enclosure, and blocked speaker ports – helping to optimize performance and maintain the desired sound quality.

The entire system is integrated into a single chip with digital interfaces for portable devices. The IC incorporates NXP's CoolFlux audio DSP, a high-efficiency class-D amplifier with current sensing, and a DC-to-DC boost converter. The advanced, embedded algorithms require no separate licensing. Additional tools allow designers to customize audio sound quality and choose how to optimize mobile device performance. A video demonstration of this technology is available on the Internet [here](#).



Hilton Anatole – Dallas, Texas – September 19-21



This year's all new technology program covers issues that are important to all radio engineers. Change is occurring very quickly and impacting the ways we conduct business and generate revenue. "It's not your father's radio station anymore..." is more appropriate today than ever. Technology is moving consumers to

new platforms and generating competition for our products. We have assembled a program of sessions and discussions developed specifically for radio professionals who need to keep up with regulatory issues, HD radio developments, disaster preparedness and new Hybrid Radio technologies. You will have ample time to network with your peers and meet with Radio Show exhibitors who can assist with your technical challenges and offer fresh insights and solutions.

The Marketplace at the Radio Show will showcase a robust exhibit floor, packed with products and services to drive your business forward. Also the hub for a variety of special events, the Marketplace gives conference attendees the opportunity to grow key business relationships, network with industry partners and explore what's on the horizon for radio.

The Marketplace is also the venue for the Opening Reception, Super Sessions, a special Thursday lunch buffet, a Networking Lounge and coffee breaks.

Registration details and more are available online at www.radioshowweb.com. See you in September!

Registration Open for 2012 IEEE Broadcast Symposium

Registration for the [2012 IEEE Broadcast Symposium](#) is now underway. This year, the October 17-19, 2012 event's [technical program](#) includes more than 20 presentations from top industry leaders on cutting edge broadcast engineering topics, as well as half-day tutorial sessions on broadcast IP technology and broadcast engineering computer simulation tools.



In addition to technical presentations and tutorial sessions, this year's program features a panel discussion on broadcast towers and an update on the government's broadband plan, spectrum usage, and broadcast audio issues.

The Symposium also offers attendees the opportunity to network and socialize with their peers at evening receptions and luncheon programs. This year's luncheon keynote speakers are Kevin Gage, NAB's executive vice president and chief technology officer, and Sam Matheny, Capitol Broadcasting's vice president of policy and innovation. For those unable to attend in person, all Symposium sessions will be made available globally via live and archived streaming on the Internet. Also, up to 2.5 Continuing Education units (CEUs) are available to on-site attendees. Complete information is available on the Symposium website..

The three-day event will be held at [The Westin Alexandria](#) hotel in Alexandria, Va. Early registration is encouraged in order to take advantage of special rates which expire after Oct. 1, 2012. Special early bird hotel room rates are also available. For complete registration information, visit the organization's website at <http://bts.ieee.org/broadcastsymposium>.





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