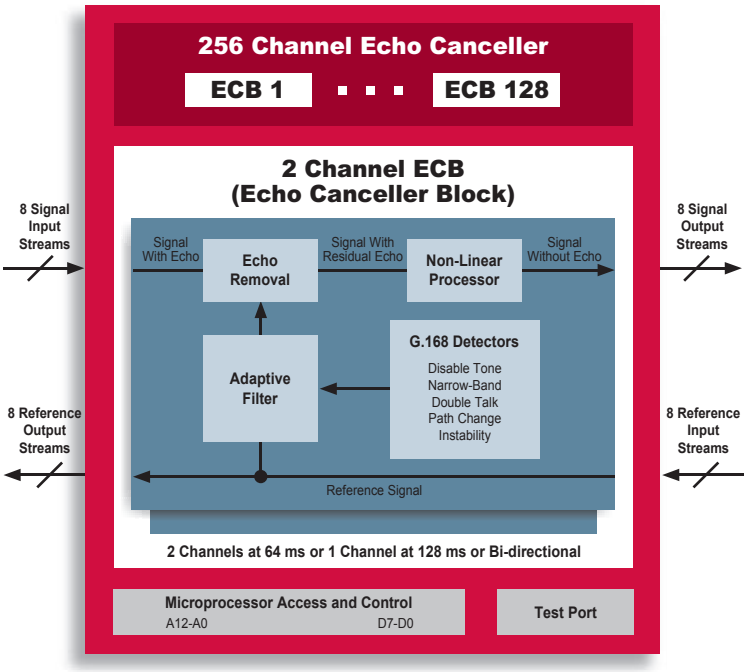
ZL50211/2
VOICE PROCESSING/VOICE ECHO CANCELLATION

VOICE/DATA

ZL50211 Simplified Block Diagram



The ZL™50211 and ZL50212 are voice echo cancellers (VECs) that use a patented non-linear processor (NLP) software algorithm to improve voice quality in delay-sensitive, packet-based networks.

The devices use an efficient architecture that reduces board space and development resource requirements, thereby providing the industry's lowest cost per channel. The family includes a full range of solutions to meet specific customer and class-of-service requirements.

The ZL50211 supports 256 channels of echo tails at 64 ms. This is eight times the capacity of Zarlink's previous generation, providing existing customers with a 58% reduction in board space. The ZL50212 supports 288 channels of echo tails at 64 ms. Cascading this device with the 256-channel ZL50211 and 128-channel MT93L04 easily enables DS3 capacity.

The ICs are carrier-grade echo cancellers, having undergone rigorous testing by AT&T's Voice Quality Assessment lab. The tests found the devices to outperform competitive offerings in convergence speed, double-talk performance, and stability.

Package and Availability

- Package: 535-ball BGA
- Volume production: Now

Highest Channel Density

- ZL50211—128 ch. at 128 ms up to 256 ch. at 64 ms
- ZL50212—144 ch. at 128 ms up to 288 ch. at 64 ms

Highest Voice Quality

- Removes long residual echo tails without noise gating or contrasting
- Comfort noise injection uses spectrally matched background noise
- Adjustable signal gain/loss reduces clipping, squalling and hissing sounds
- Variable slow convergence speeds improve performance during double talk
- Instability detector suppresses variable pitched ringing or oscillation
- Path change detect permits fast re-convergence when a major change occurs in the echo channel
- Narrowband detect enables stable performance against signal divergence and high echo environments

Flexibility

- Configurable to allow simultaneous operation of echo channels at 64 ms or 128 ms
- Programmable for normal (64 ms), back-to-back (bi-directional 64 ms) or extended delay (128 ms) configurations

Ease of Use

- Streamlines AT&T equipment certifications
- Backwards compatibility ensures seamless upgrade path

Applications

- Media access gateways
- T1/E1 multi-channel echo cancellation pools
- Wireless CDMA/GSM networks
- Interactive voice response systems

Standards Compliant

- ITU-T G.168 revisions for 1997 and 2000
- ITU-T G.165
- ITU-T G.164 tone disable requirements

Complimentary Products

MT92210/20, MT9072/6, MT90866, MT93L04, MT90401

Customer Support

The ZL50211/2 VECs are supported by Zarlink's network of in-house field application and design engineers. Evaluation boards are available, supplied with full design and applications documentation.

ZARLINK SEMICONDUCTOR

ZL50211/2
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Applications

In telephony systems, echo becomes noticeable when the round-trip delay of voice traffic exceeds 30 ms. When voice and data are converged over packet-based networks, round-trip delay can approach 50 ms—at which point virtually all callers will complain of poor voice quality.

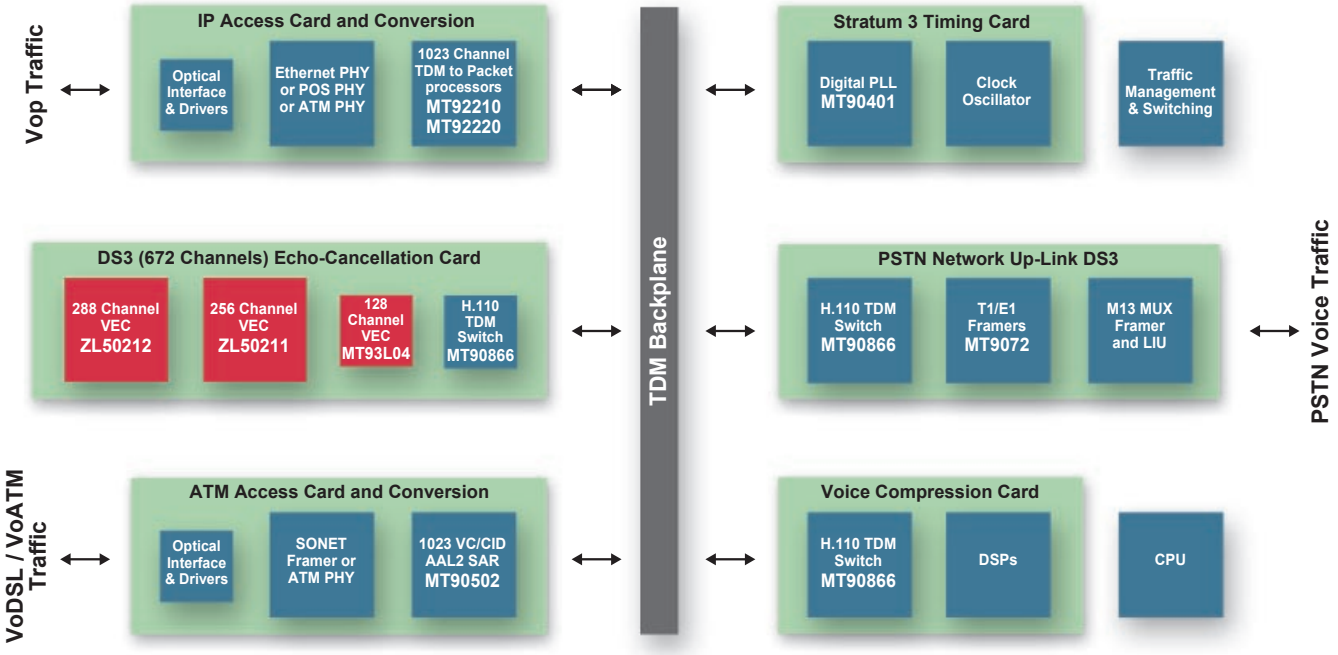
The ZL50212 and ZL50211 reduce the effects of this delay using a patented NLP software algorithm. The algorithm includes several features to improve voice quality when implemented in equipment like the carrier-class IP gateway illustrated below.

First, when removing residual echoes, the algorithm uses a spectral matcher to inject comfort noise. This eliminates the echo or switching effects associated with conventional methods.

The algorithm also improves performance during double talk. Unlike alternative solutions, which cannot determine whether the signal is echo or far-end speech, Zarlink's algorithm adjusts to a slow convergence speed once double talk is detected. The convergence speed can be slowed by as much as 128 times that of the fast convergence mode to dramatically improve stability.

In addition to high voice quality, the VECs provide several advantages over alternative integrated voice/packet processor and DSP approaches. Most of today's integrated processors encounter latency problems, while DSP solutions compromise size, cost and performance once density increases to more than 32 channels. Compared to Zarlink's ZL50211, a 256-channel DSP solution requires up to eight additional components, and consumes almost three times the current. DSP solutions also require more board space and substantial engineering resources for code development.

Carrier Class Voice Gateway Application



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