

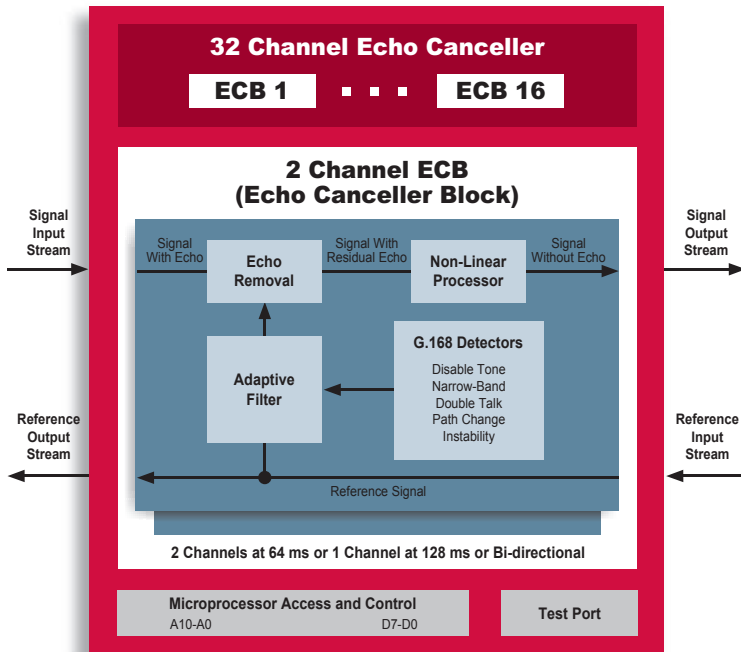
# ZL50232/3/4/5

VOICE PROCESSING/VOICE ECHO CANCELLATION

VOICE/DATA



## ZL50232 Simplified Block Diagram



The ZL™50232, ZL50233, ZL50234, and ZL50235 are highly integrated voice echo cancellers (VECs) that optimize voice quality in a wide range of low-density wireless and telephony equipment.

Low-density wireless local loop (WLL) systems, such as Asia's Personal Handyphone System (PHS), are increasingly being deployed for voice and Internet access, as an alternative to more costly, wired telephone networks. However, the growing traffic from voice calls, fax transmission and modem signals sent over these short, high-speed wireless links is driving the need for more advanced echo cancellation and voice compression technology.

Zarlink's ZL50232/3/4/5 VECs are off-the-shelf devices that support 4 to 32 voice channels, and cancel echo tails of 64 ms or 128 ms. The VEC chips utilize a patented non-linear processing (NLP) technology that optimizes convergence speed, double-talk performance, and stability. These features improve subjective voice quality, and help ensure carrier-grade voice connections by removing echoes, clicks, and hisses caused by network noise and round-trip delays in speech signals.

### Package and Availability

- Packages: 100-pin LQFP or 208-pin LPGA
- Volume production: Now

### Off-The-Shelf 4 to 32 Channel VEC

- ZL50232—16 ch. at 128 ms up to 32 ch. at 64 ms
- ZL50233—2 ch. at 128 ms up to 4 ch. at 64 ms
- ZL50234—4 ch. at 128 ms up to 8 ch. at 64 ms
- ZL50235—8 ch. at 128 ms up to 16 ch. at 64 ms

### Highest Voice Quality

- NLP with adaptive suppression threshold and spectrally matched comfort noise injection removes residual echo and minimizes switching effects
- Fully programmable convergence speeds per channel improves performance during double talk
- Fast re-convergence on echo path changes
- Protection against narrowband signal divergence in high echo environments or in the presence of tones like DTMF
- Adjustable gain/loss on all I/O reduces clipping, squalling and hissing sounds
- Carrier-grade voice quality per AT&T Voice Quality Assessment Lab

### Flexibility and Ease of Use

- Independent multiple channels of echo, configurable for simultaneous operation at 64 ms, 128 ms or bi-directional
- Compatible to ST-BUS and GCI Interfaces with 2 Mb/s serial PCM data
- Low power operation (4.6 mW per channel) with independent power down mode
- 3.3 V operation with 5 V tolerance on input pins
- Compatible pin-outs simplify system upgrades

### Applications

- Wireless local loop base stations & controllers (PHS/DECT)
- Voice/telephony gateways and digital PBX systems
- Integrated access devices

### Standards Compliant

- ITU-T G.168 (2000) and G.168 (2002)
- ITU-T G.165
- Fax/modem G.164 2100 Hz Tone Disable

### Complimentary Products

ZL50010, MT9074/6, MT9126, MT9171/2/3/4

### Customer Support

The ZL50232/3/4/5 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.

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### Applications

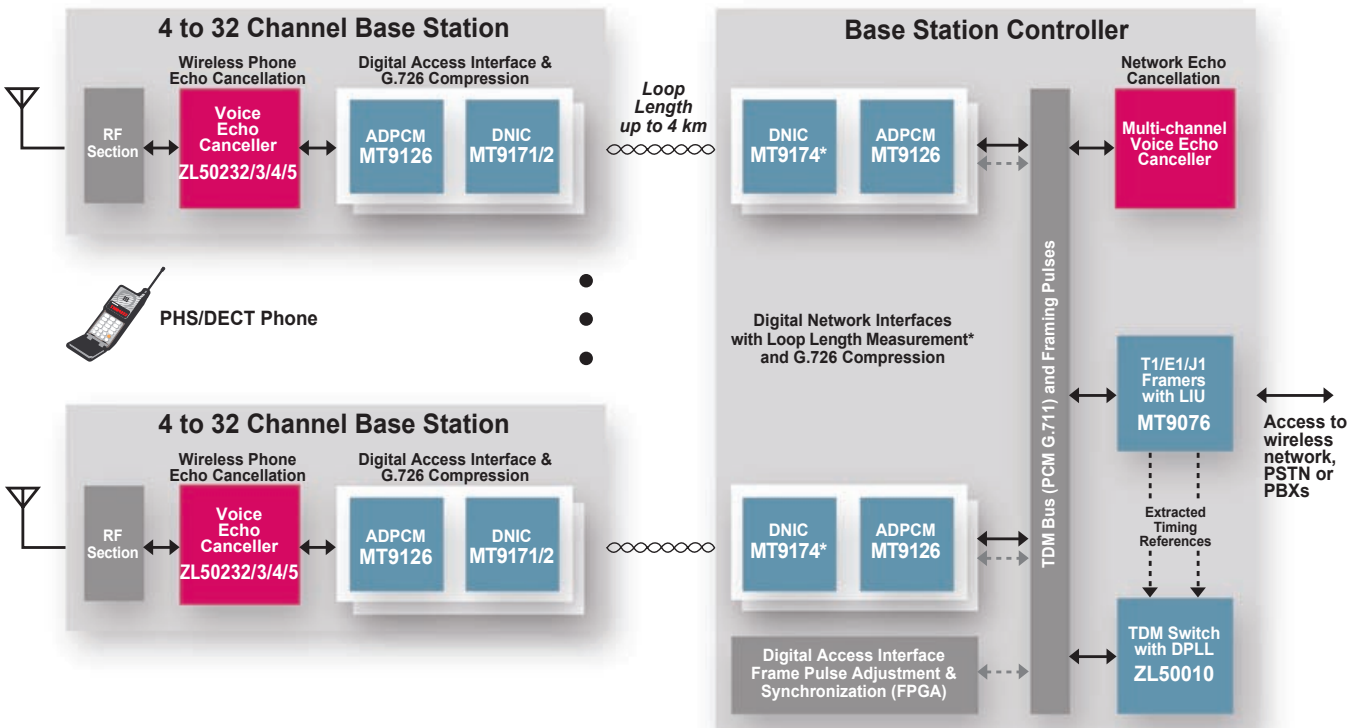
As shown below in a PHS base station example, Zarlink's ZL50232/3/4/5 VECs provide the ideal echo cancellation solution for wireless local loop equipment. Each of the VECs provides a complete, off-the-shelf solution that supports all echo cancellation requirements: measuring the echo path; adjusting the adaptive filter that estimates and replicates the echo; subtracting the replicated echo from the actual echo; and removing and residual echo.

The ZL50232/3/4/5 VECs use patented NLP technology that improves voice quality through adaptive suppression and comfort noise injection. Comfort noise is injected using a spectral matcher that adjusts the background noise and ensures that the line does not click or sound "dead" when echoes are cancelled. Voice quality is further improved with the VEC's ability to automatically adjust to a slow convergence speed during double talk.

Zarlink's ZL50232/3/4/5 also feature adjustable amplifiers/attenuators on every I/O, which offer signal level control to minimize clipping, squalling and hissing sounds when the Echo Return Loss (ERL) in the network is not optimized.

Zarlink's new voice echo cancellers provide OEMs with an efficient solution compared to alternative ASIC or DSP-based devices. For the same level of functionality, alternatives frequently require a higher bill of materials, increased board space, and extensive software development resources.

### PHS/DECT Wireless Network Application Example



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