Building on five generations of voice echo cancellation expertise, the highly integrated ZL38015 hardware and ZLS38233 firmware platform helps manufacturers simplify design, speed time-to-market and lower costs of telecom equipment supporting voice services over converging networks.

Supporting full-band echo cancellation and advanced algorithms, the ZLS38233 is a four-channel VEC with echo tail programmable up to 64 ms per channel. The ZLS38233 firmware also integrates a range of features, including DTMF (Tx), DTMF (Rx) and ALC (automatic level control) to support superior voice quality and reduce bill-of-materials costs. Firmware is field-upgradeable for future product revisions.

The ZL38015 voice processing platform is built on a voice optimized 100 MHz (200 effective MIPS) DSP with an integrated 1024 tap filter co-processor, 16 KW instruction and 8 KB data memory, hardware accelerators, SPI/UART/TDM interfaces, multiprotocol TDM ports, flexible clocking scheme support and 10 GPIOs.

ZLS38233 Firmware Supporting High Quality Voice

- Four-channel G.168 echo canceller with programmable echo tail length (maximum combined echo tail length of 256 ms)
- PCM coding, U/A-Law ITU-T G.711 or sign magnitude
- Per-channel fax/modem G.164 2100 Hz or G.165 2100 Hz phase reversal tone disable
- Fast reconvergence on echo path changes, fully programmable, convergence speeds
- Patented advanced NLP with high-quality subjective performance
- G.169 ALC maintains loop gain through a programmable gain range from 0 db to −24 to 24 db
- Four independent DTMF receivers (DTMF Rx)
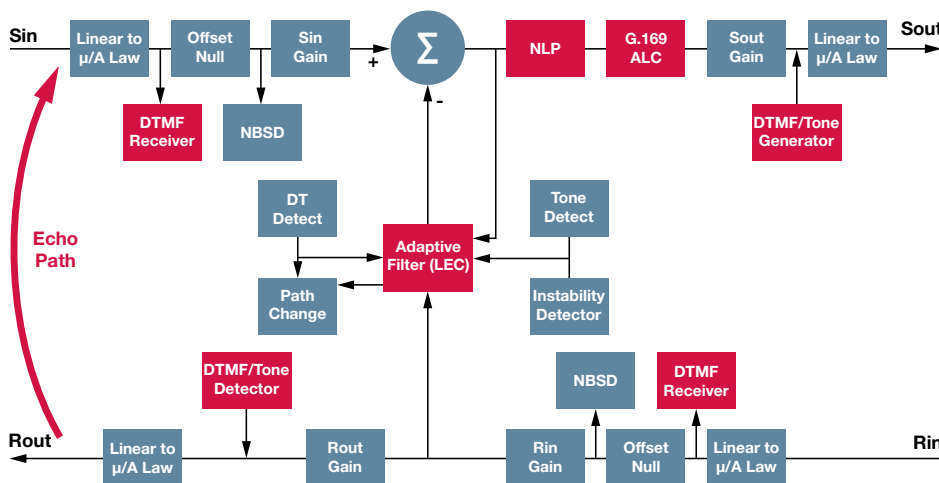- Four independent programmable tone/DTMF generators (DTMF Tx)

ZL38015 Voice Processing Platform

- 100 MHz (200 MIPs) voice processor with butterfly accelerator
- On-board data (26 Kbytes), instruction (24 Kbytes) RAM and Boot (3 Kbytes) ROM
- 2048 tap shared filter co-processor with 128 tap increments
- Flexible PCM ports support TDM protocol (ST BUS, GCI or McBSP framing or SSI modes)
- 10 GPIO pins
- Bootloadable for future Zarlink software upgrades

Customer Support

The ZL38015 hardware and ZLS38233 firmware is supported by reference designs and Zarlink's network of in-house field application and design engineers.

ZLS38233 Block Diagram

ZLS38233 Block Diagram

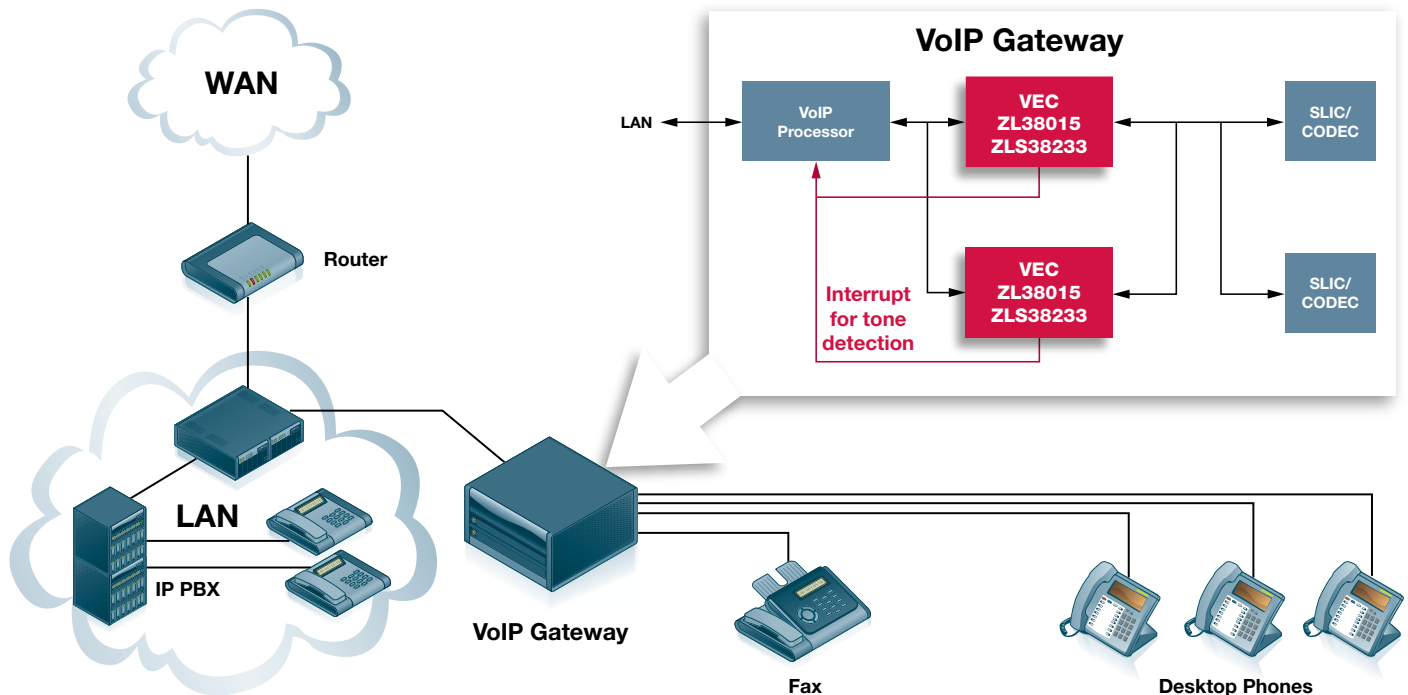ZARLINK SEMICONDUCTOR

APPLICATION

VoIP Gateway Supporting Converging Voice Services

The ZL38015/ZLS38233 platform is a four-channel VEC with integrated DTMF transceiver designed for enterprise and residential gateway applications. Each channel of the ZL38015/ZLS38233 provides an integrated and upgradeable solution that meets strict echo cancellation requirements, including G.168, G.164/G.165, and G.169. The platform allows equipment manufacturers to lower BOM costs and reduce both time-to-market and integration resources.

The rapid growth of VoIP services is driving demand for a new class of telecom equipment to ensure superior voice performance across converging networks. As illustrated below, ZL38015/ZLS38233 VEC with integrated DTMF transceiver is well suited for converged network gateways that must deal with complex echo issues and seamlessly handle voice traffic with no discernable loss in quality for the end-user.

The ZLS38233 firmware implements Zarlink's best-in-class VEC core competencies: a maximum of 256 ms (64 ms per channel) of G.168 compliant echo tail cancellation for converging networks, an advanced NLP improving voice quality with comfort noise injection; a G.169 ALC for effective automatic loop gain control; gain control at all ports; and fast convergence during double-talk.

The ZL38015 voice processing platform is built on a voice optimized 200 (effective MIPS) DSP with an integrated 1024 tap filter co-processor, 16 KW instruction and 8 KB data memory, hardware accelerators, SPI, UART and TDM interfaces, multiprotocol TDM ports, flexible clocking scheme support and 10 GPIOs. This platform ensures future scalability and feature improvement while providing flexibility and increased performance.

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