

Embedded Connectivity Summit 2004

VoIP Reference Designs from Unicoi Systems
October 4-6, 2004

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Unicoi Systems Company Overview

Founded in 1999

Purchased Fusion from NetSilicon in June 2002

Approximately 15 Employees

Most Employees come from CE Industry

- Motorola, Panasonic, Hitachi, Home Wireless Networks



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Robust Software Offering

Fusion RTOS

Fusion Net

Fusion Web

Telephony Software for 56800E DSP

Fusion RTOS

Supported Motorola processors

- **Freescale PowerPC™**
- **56800E DSP Family**
- **StarCore**

Fusion Net

World's most widely used embedded protocol suite (Since 1982)

- **TCP/IP, UDP, RTP/RTCP, SIP/SDP, SNMP, NAT, PPP, DNS, DHCP, Telnet, FTP, etc.**

Fusion VoIP Software

- **SIP/SDP**
 - Small Footprint
 - RFC3261, RFC2327
 - RFC3263, RFC3264 and RFC3265 are currently under development
- **RTP/RTCP**
 - Small Footprint
 - RFC1889, RFC1890

Fusion Web

WebPilot Web Browser

HTTP Client & Server

SOAP

XML DOM/SAX Parsers

XML to C Compiler

Fusion Secure

HTTPS

SSL

IPsec

IKEv1/v2



Fusion Telephony Software for 56800E DSP

Codecs - G.711, G.723.1A, G.726, G.729AB

Line Echo Cancellers – G.165, G.168

DTMF Detection/Generation

Voice Activity Detection (VAD)

Comfort Noise Generation (CNG)

Call Progress Tones (CPT)



Low Cost VoIP Reference Designs

Embedded Connectivity Summit



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Low Cost VoIP Reference Designs

Turnkey designs ready for manufacturing

- Includes all Schematics, Software and Codecs
- Modular design for upgrading to multiple POTS Lines and Ethernet connections

Standards based VoIP Architecture

- SIP (RFC 3261), SDP, RTP/RTCP
- Robust testing process
- Unicoi indemnifies all software

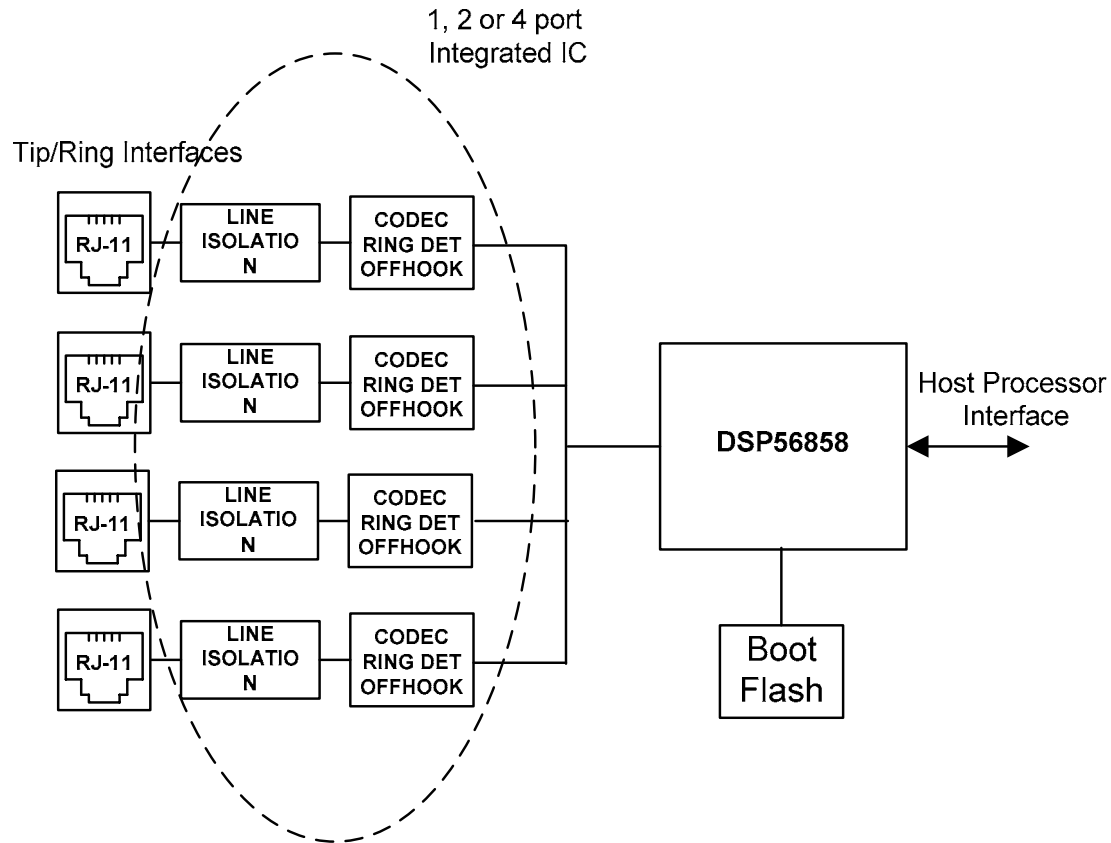
Small software footprint allows for lower cost memory

- SIP/SDP/RTP/RTCP - ~150 K

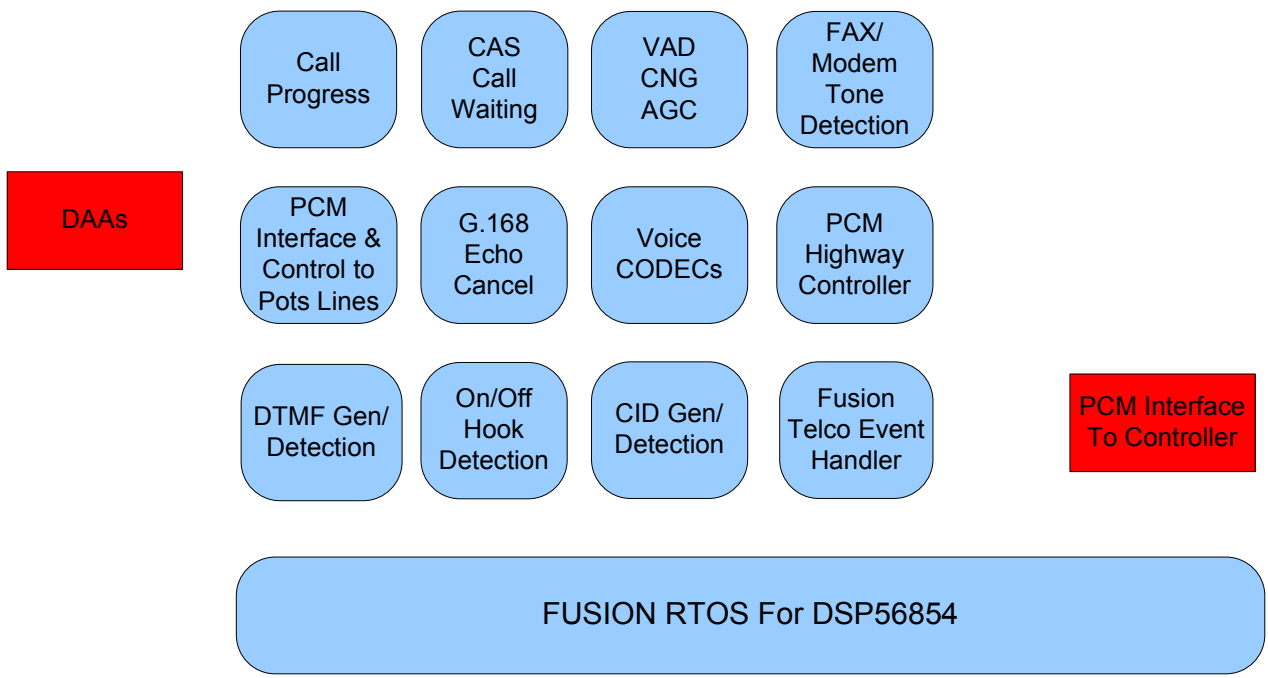
Design uses latest low cost IC's selected for simple manufacturing, reduced PCB cost and increase factory yield

Optional HW security acceleration

VoIP Voice Engine



Voice Engine SW Modules

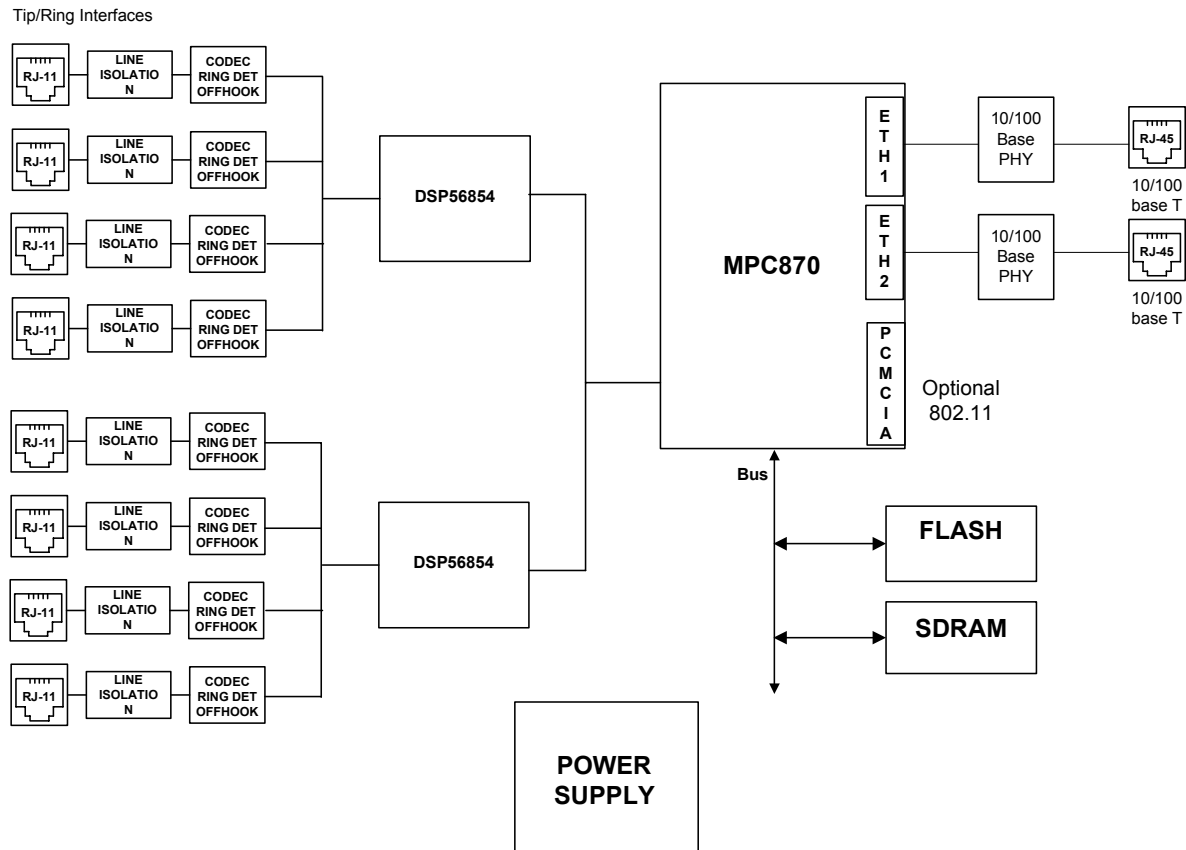


VoIP Engine – Silicon BOM

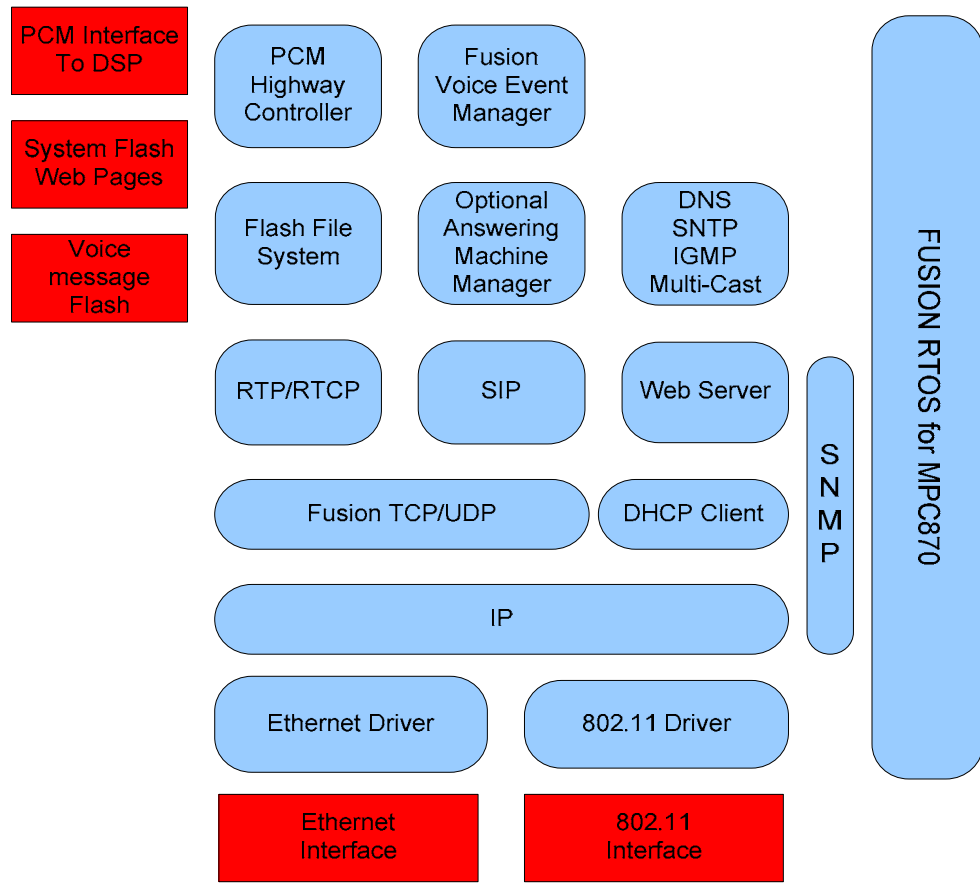
- Supports Up to Four POTS Lines Per DSP
- Support for G.711, G.723.1A, G.726, G.729AB, DTMF Detection/Generation, Echo Cancellation, Voice Activity Detection, Comfort Noise Generation, Call Progress Tones

Voice Engine		
DSP 56854FG120	\$5.00	\$4.35
Crystal	\$0.20	\$0.15
SRAM	\$1.30	\$1.04
Le88111 FXS Driver	\$2.72	\$2.47
Discretes	\$1.31	\$1.13
Total	\$10.53	\$9.13
Additional POTS line	\$3.25	\$2.96

VoIP Terminal Adaptor (TA)



VoIP TA Controller SW Modules

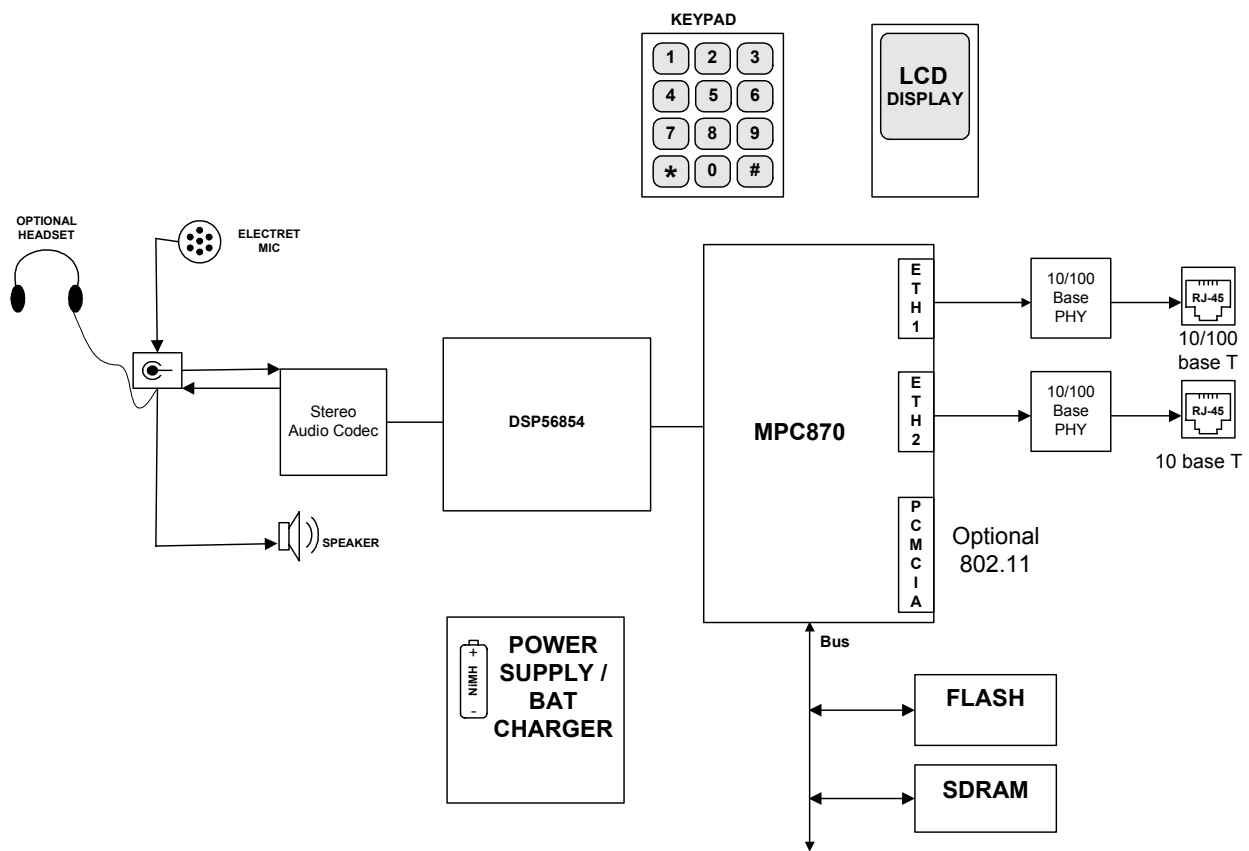


VoIP TA – Silicon BOM

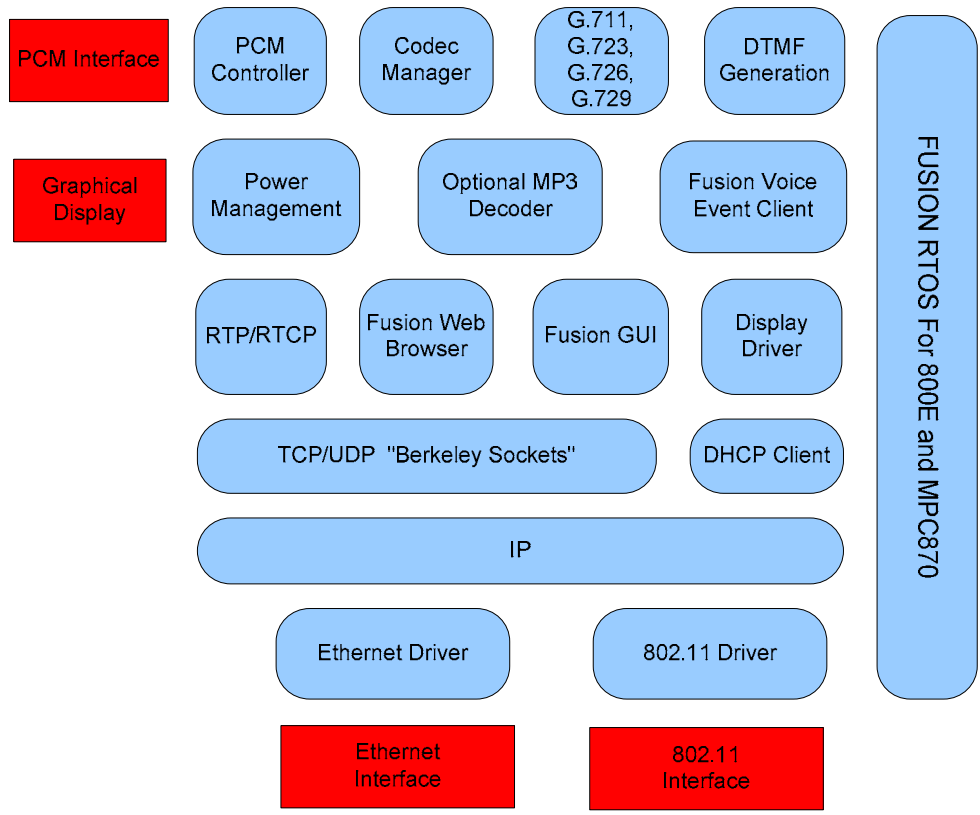
- One Ethernet Connection and One POTS Line Out
- Additional POTS Lines and Ethernet Connections Optional
- Supports Up to Four POTS Lines Per DSP

Networking Section	100K	1,000K
MPC870ZT66	\$6.70	\$6.09
Ethernet PHY	\$1.00	\$0.82
Transformer	\$0.40	\$0.30
Crystal	\$0.20	\$0.15
Flash (2 Mbytes)	\$1.40	\$1.20
SDRAM (8 Mbytes)	\$2.10	\$1.80
Discretes	\$0.55	\$0.46
Total	\$12.35	\$10.82
Voice Engine		
DSP 56854FG120	\$5.00	\$4.35
Crystal	\$0.20	\$0.15
SRAM	\$1.30	\$1.04
Le88111 FXS Driver	\$2.72	\$2.47
Discretes	\$1.31	\$1.13
Total	\$10.53	\$9.13
Terminal Adapter Total		
	\$22.98	\$19.97
Additional Ethernet	\$1.40	\$1.12
Additional POTS line	\$3.25	\$2.96
Mechanical estimates		
	100K	1,000K
Ethernet Connectors	\$0.28	\$0.24
POTS Connectors	\$0.22	\$0.19
Plastics	\$3.50	\$2.75
PCB	\$3.20	\$2.50
Shielding	\$0.50	\$0.40
Power Supply	\$1.40	\$1.25

VoIP Handset



VoIP Handset SW Modules



VoIP Handset – Silicon BOM (100 K)

MPC870ZT66	\$6.70
DSP 56854	\$5.00
Flash	\$1.40
SDRAM	\$2.10
SRAM	\$1.30
Audio Codec	\$1.10
Power ICs	\$1.50
2 Net PHYs	\$3.50
Total	\$22.60

Scheduled Delivery

Voice Engine

- Complete

Terminal Adaptor

- Complete

VoIP Handset

- November 2004

Why Unicoi?

World Class Support

- Experienced Protocol Engineers
- Guaranteed 24 hour response

Contract Services

- Experienced telco development team

Proven Software

- Fusion is in millions of embedded devices
- Sample customers include IBM, Sony, Panasonic, Motorola, Sharp, Toshiba, Siemens, Lucent, Scientific Atlanta, Sanyo, Thomson, Philips...and many more.