Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

EBV Seminar June 2007

Freescale 8-bit Products Overview and Wireless Networking

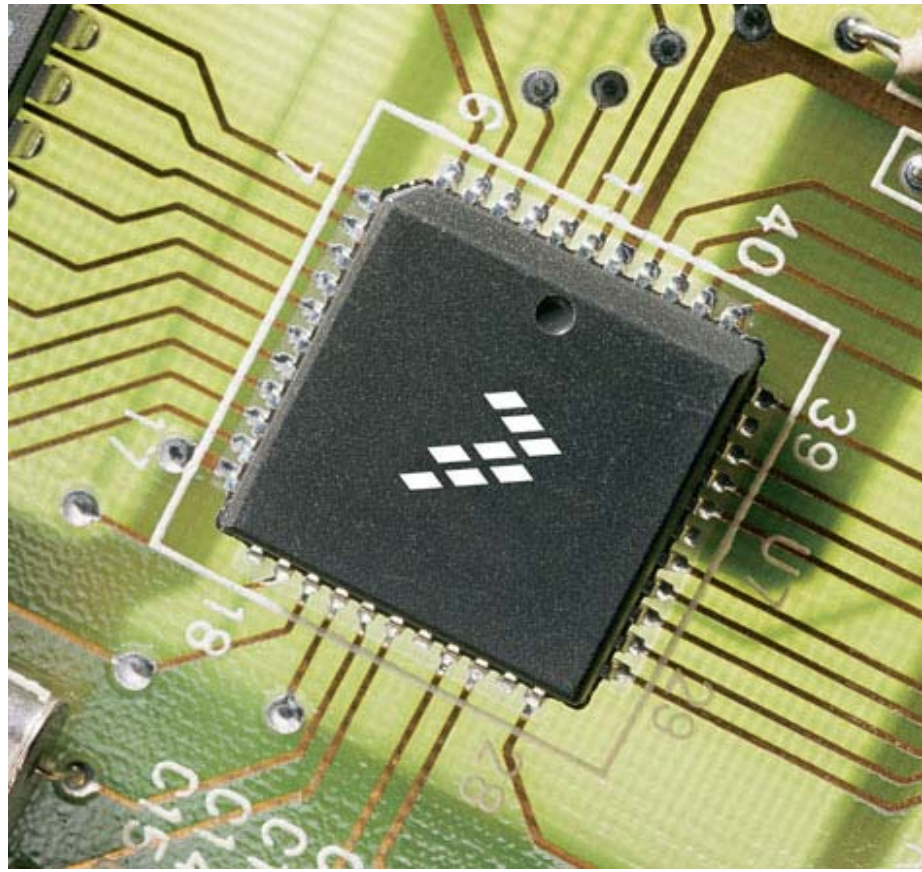
Presenter: Moshe Levy

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Wireless Networking using the HCS08

- Freescale Semiconductor
- 8-bit Microcontrollers
  - 8/32 bit Controller Continuum
- Development Tools Overview
  - Discovery Kit
- ZigBee Solutions
  - Next generation PiP

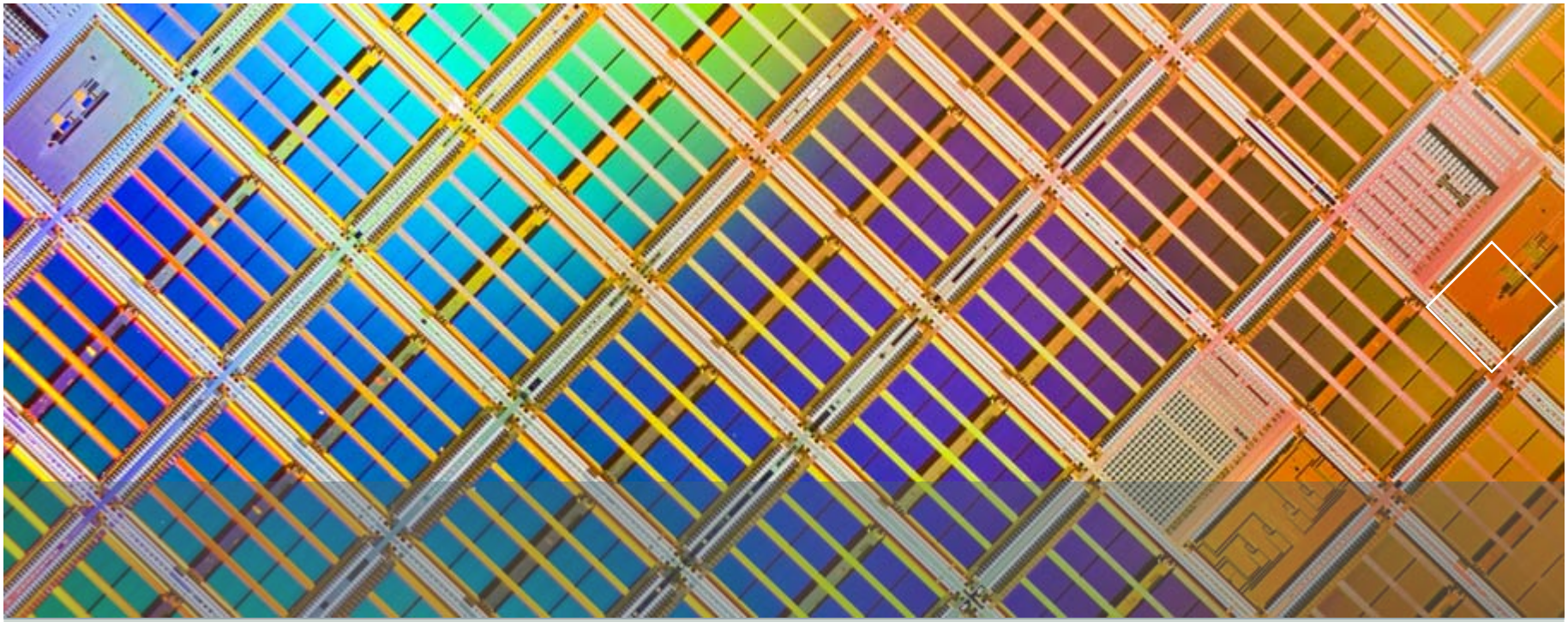


Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

- For the first time: True 8 bit to 32 bit **Processor Continuum**
- Wide range of competitive **low power/low cost** 8 bit MCUs which fit to your application.
- Comprehensive, **free/low cost, easy to use** development tools - Fast Track
- Full **ZigBee solution** hw/sw including ZeeStack, BeeKit, SiP and PiP

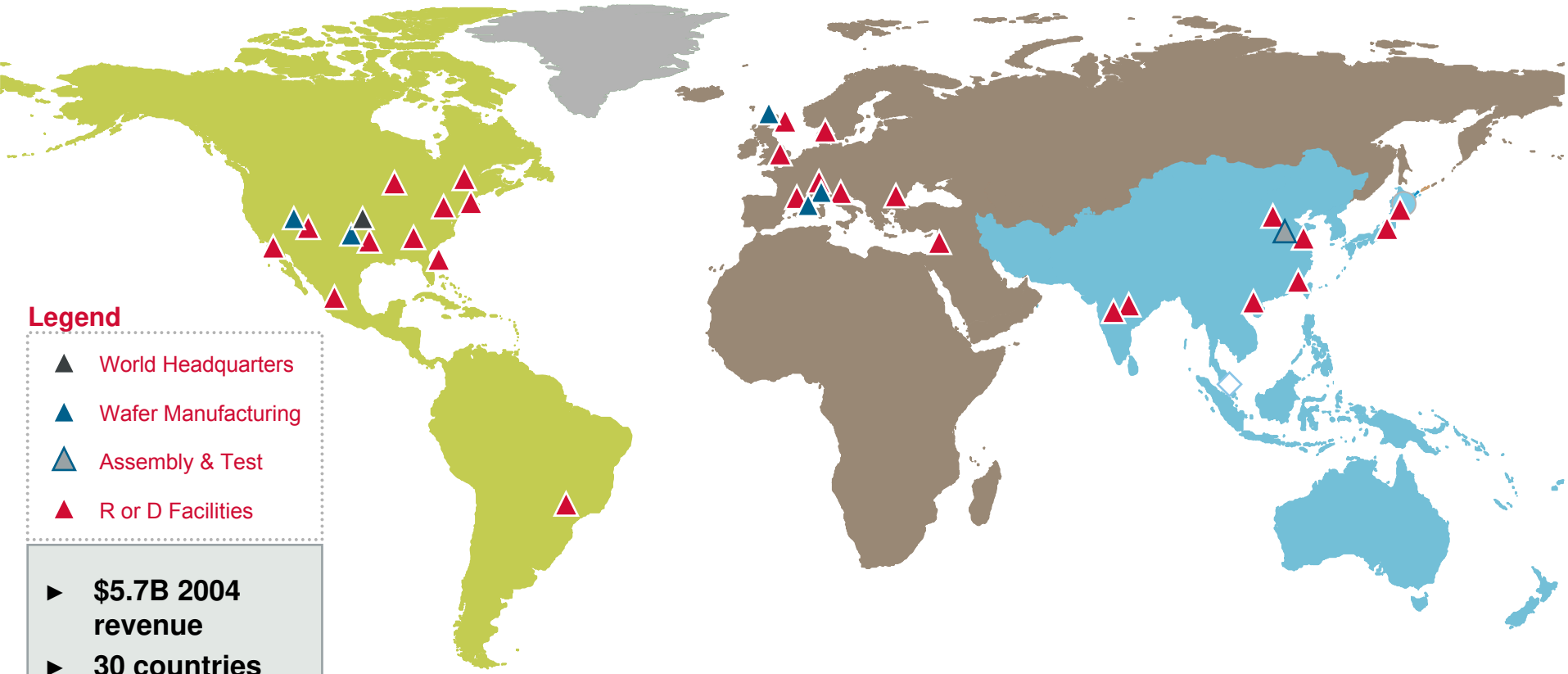
Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.



Freescale Semiconductor

freescale™
semiconductor

Operating Around the World



Legend

- World Headquarters
- Wafer Manufacturing
- Assembly & Test
- R or D Facilities

- **$5.7B 2004 revenue**
- **30 countries**
- **10,000+ customers**
- **22,000+ employees**

Americas

- 9, 200 employees
- 4 factories
- 10 design centers

EMEA

- 4,500 employees
- 3 factories
- 8 design centers

Asia Pacific/Japan

- 9,000 employees
- 3 factories
- 8 design centers

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Internal Worldwide Manufacturing

Freescale Chandler Fab – 8”
Chandler, AZ

Freescale Sendai Fab-6”
Sendai, Japan

Freescale Tempe Fab – 6”
Tempe, AZ

Freescale Oak Hill Fab – 8”
Austin, AZ

Freescale Austin Technology & Mfg Fab – 8”
Austin, AZ

Freescal East Killbride Fab – 6”
East Kilbride, Scottland

Crolles Alliance [1] – 12”
Grenoble, France

Freescale Tianjin Final Mfg
Tianjin, China

Freescale Toulouse Fab – 6”
Toulouse, France

Freescale Kuala Lumpur Final Mfg-
Kuala Lumpur, Malaysia

Designates 8bit Manufacturing Sites

Note: Freescale also uses external manufacturing sites such as TSMC

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale's Business Groups

WMSG

Wireless & Mobile Systems Group

- Platforms for cellular handsets & other products
- Baseband components
- Application processors
- RF components
- Software solutions

NCSG

Networking & Computing Systems Group

- PowerQUICC™ communications processors
- PowerPC® (1) processors
- DSPs
- RF devices
- Network multimedia & connectivity
- SemiCustom ASICs

TSPG

Transportation & Standard Products Group

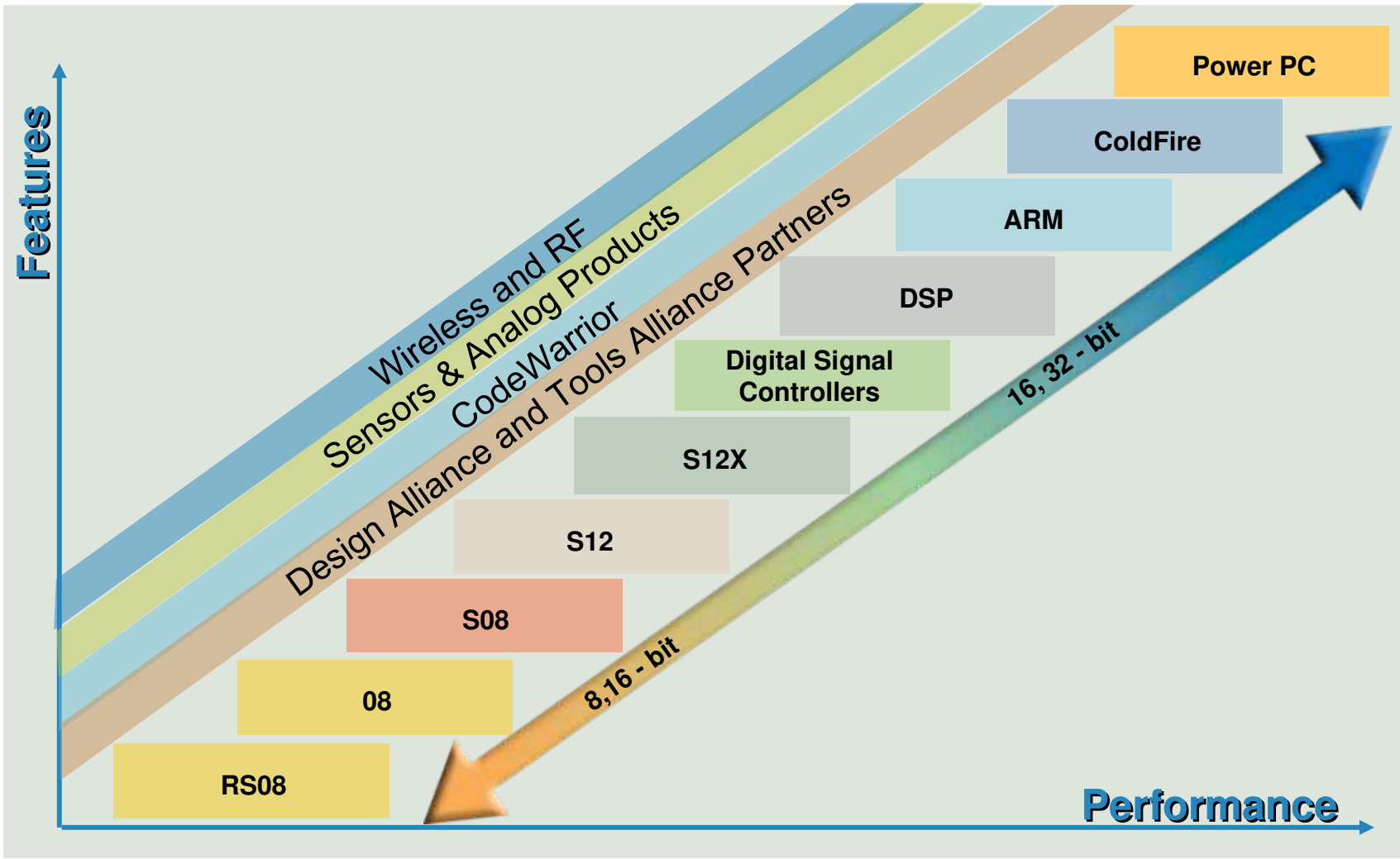
- Microcontrollers
- Embedded microprocessors
- Analog & mixed-signal integrated circuits
- Sensors
- Digital Signal Controllers

(1) The "PowerPC" name is a trademark of IBM Corp. and is used under license.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale's Embedded Processor Continuum



Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

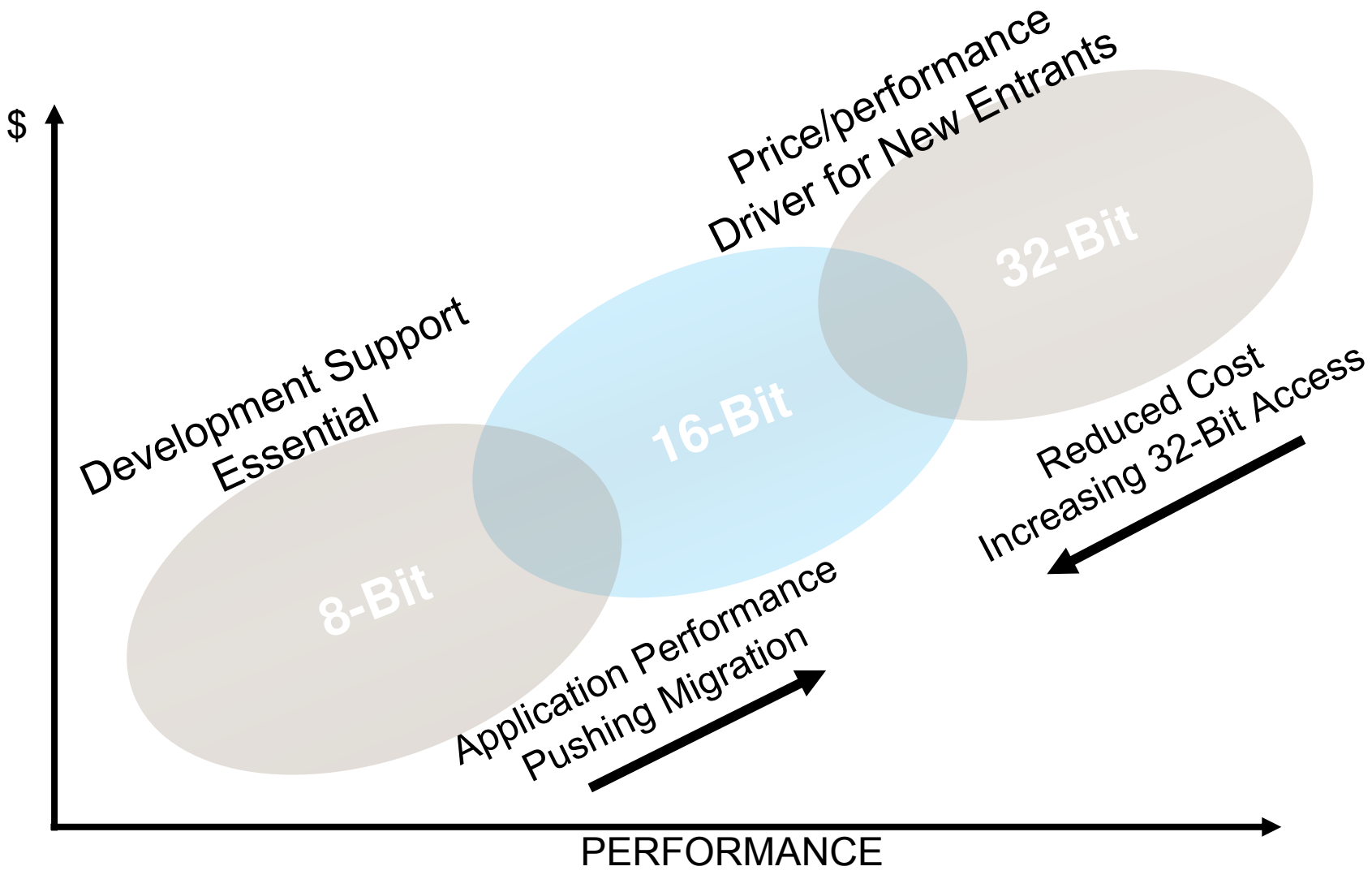
freescale™ semiconductor

8-bit to 32-bit Controller Continuum

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Microcontroller Landscape Is Changing



Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale MCU Portfolio Positioned for Growth

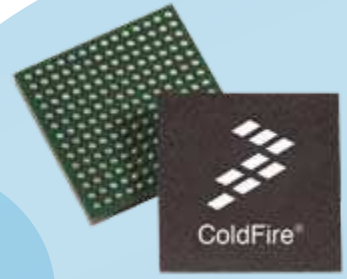
$

Reinforcing Low-End 8-bit

- 9S08QG delivers more for less
- RS08KA2 targets the sub 50¢ level
- CodeWarrior® 5.0 sets new bar for ease-of-use

16-bit Targeting Special Applications

- S12 and S12X showing strong growth in automotive
- Digital signal controllers delivering motor control solutions



Adding Muscle to ColdFire®

Control – Connectivity – Security

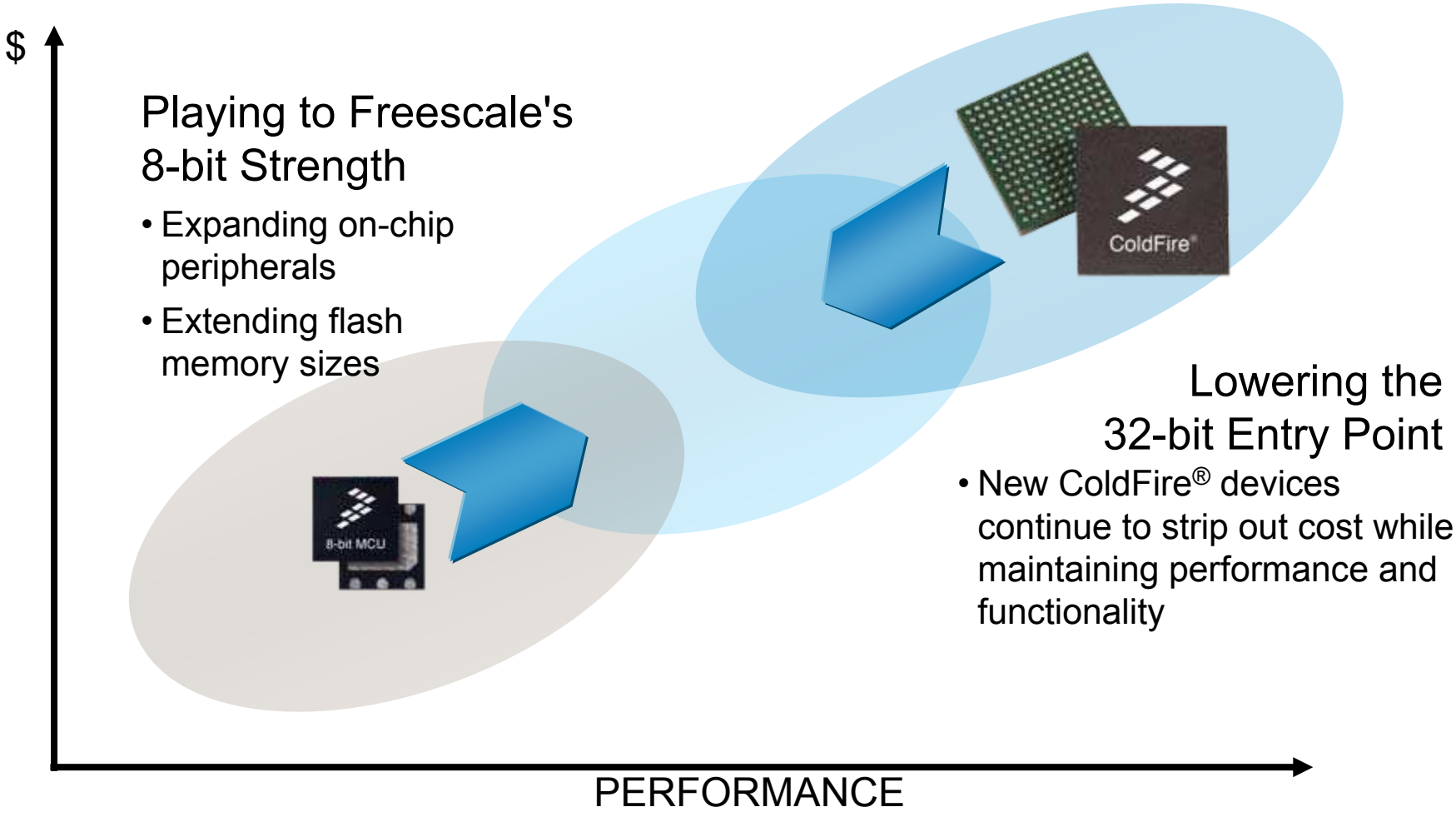
- First 32-bit MCUs for single-chip Ethernet and USB-OTG
- 32-bit performance at 16-bit price widens entry point

PERFORMANCE

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

32-bit Performance Becoming More Accessible



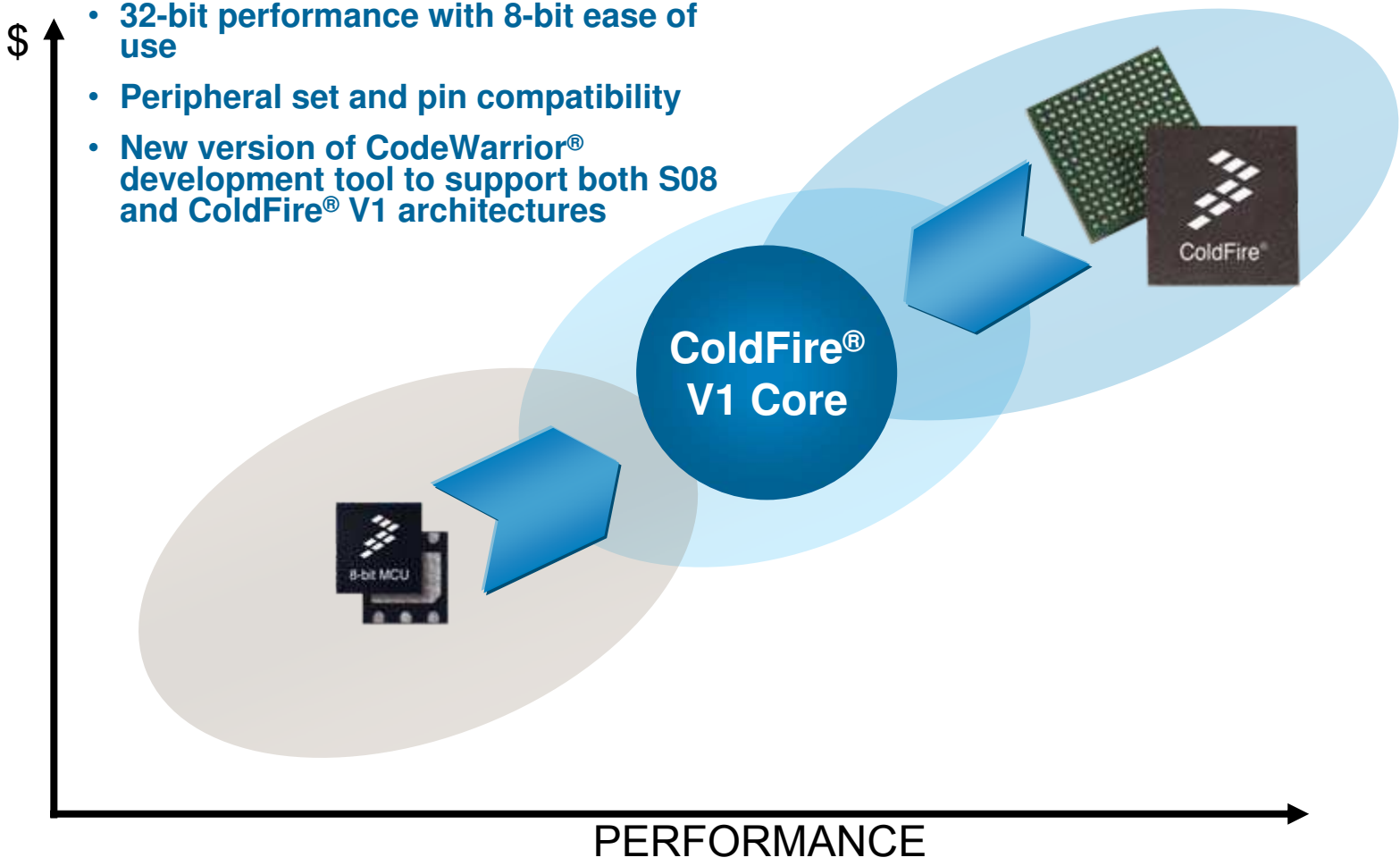
Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

ColdFire® V1: Controller Continuum Missing Link

Industry's First 8/32-bit Compatible Architectures

- 32-bit performance with 8-bit ease of use
- Peripheral set and pin compatibility
- New version of CodeWarrior® development tool to support both S08 and ColdFire® V1 architectures



Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale 8-Bit MCUs in Consumer and Industrial

Global Leadership

- Freescale a leading supplier of 8-Bit MCUs to the consumer and industrial market.

Portfolio

- Broadest portfolio & still expanding with innovative, cost-effective, and easy to use products for a wide range of 8-bit applications.
  - include HCS08, HC08, and RS08

Long-term Presence

- We know Consumer and Industrial requirements.
  - We've been delivering since 1950s

Services and Support

- Freescale is partnered and supported by leading global providers of software tools, emulators, compilers, drivers and services.

Performance

- Freescale's Consumer and Industrial MCUs are high performance
  - Our technology is improving battery life in portable devices and making home entertainment, appliances, and PC peripherals more intelligent, reliable, and connected.

Cost Effective

- Freescale's MCUs are cost competitive.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale's 8-bit Cores

The HC08 Core

- *Industry workhorse* with an impressive array of peripherals – analog, timers, communications protocols (CAN, LIN, RF, USB), & communication modules in SPI, SCI (UART), IIC
- Designed for programming in C – efficient, modular coding
- Strong memory protection features in COP, LVI, POR
- .50µ technology

The HCS08 Core

- Optimized for *extreme operating economy* – multiple stop modes, along with wait & standby
- Designed for programming in C – efficient, modular coding
- High performance up to 50 MHz CPU, 25 MHz Bus
- Utilizes .25µ 3rd generation embedded Flash technology
- Outstanding memory security and protection features including POR, LVI,
- On-chip In-circuit emulation and background debug mode

The RS08 Core

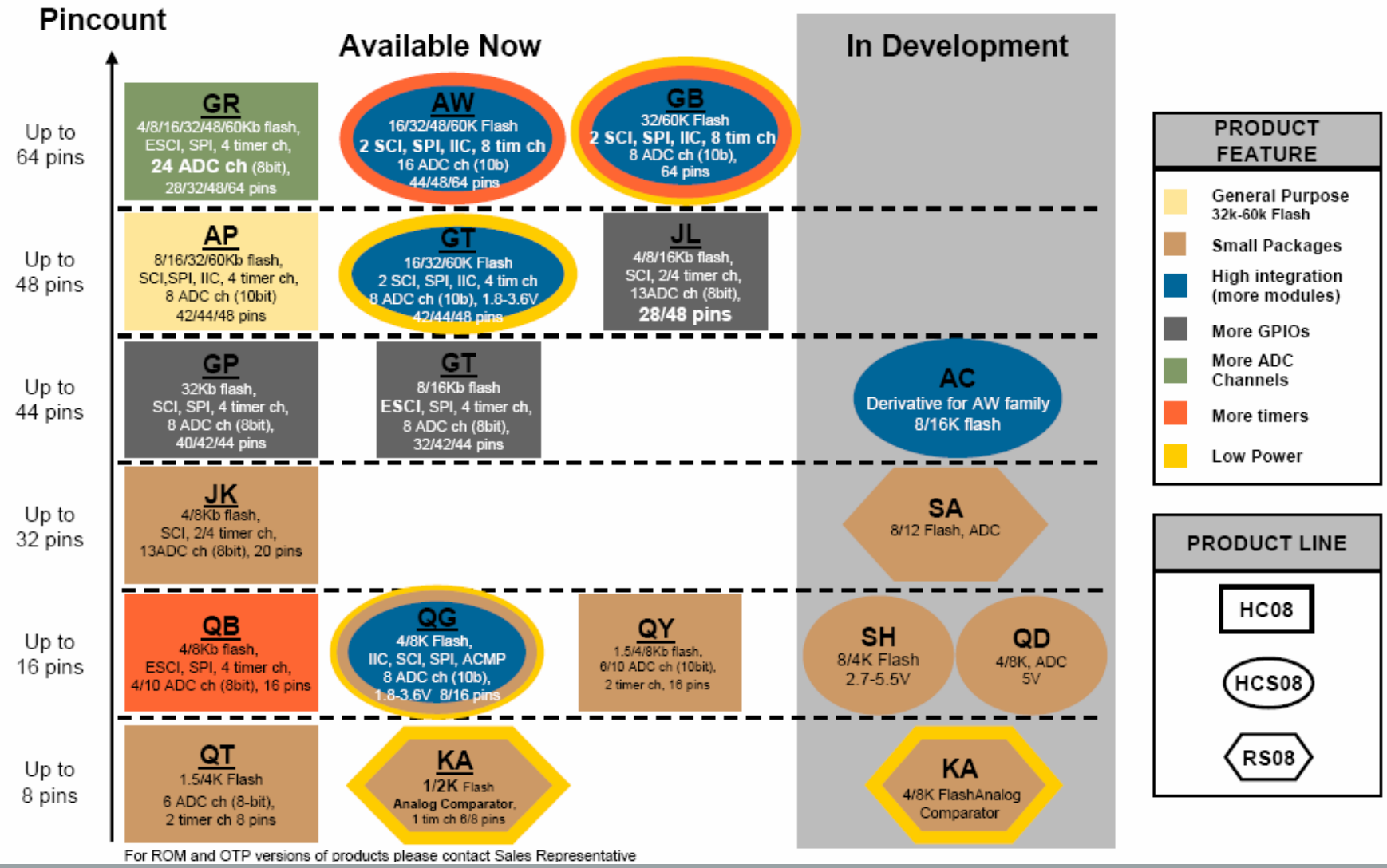
- Designed specifically for small pin-count, low memory devices
- Efficient and cost-effective for *ultra low-end applications* – 30% smaller than HCS08

Note: HC08, HCS08, & RS08 are all code compatible to Freescale legacy HC05 core.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

8-Bit Family Portfolio & Roadmap



For ROM and OTP versions of products please contact Sales Representative

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Freescale's Expanding 8-bit Portfolio
New Products in 2006

MC9S08AW60	60K, 32K, 16K flash options, 5V General Purpose
MC908LV8	Low-end LCD
MC908JL16	Upward expansion to existing JL Family
MC9RS08KA	Introduction of RS08 core, ultra-low end
MC08LT8	Low-end remote control
MC908EY16A	Next generation to existing EY Family
MC9S08GBxxA	Next generation to existing GB family
MC9S08GTxxA	Next generation to existing GT Family – adds 8K option and more RAM at low end
MC9S08QD4	5V general purpose
MC908JR12	Integrated 27 MHz RF

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Products–General Purpose

High Integration/General Purpose	
MC9S08GB –1.8V to 3.3V operation MC9S08GT – Smaller packages and fewer timers than GB.	Communications and low voltage functionality for use in a wide range of general purpose applications. Often used in combination with Zigbee™ technologies.
MC9S08AW – 2.7V to 5.5V operation	High end functionality ideally suited for large appliances, motor control, automotive applications.
High Resolution Analog	
908AP	Mid-range appliance devices
908GR	High Resolution analog with 24 channel ADC
Mid-range pin count	
MC908JL/JK MC908QC MC908QB	Mid-range I/O and memory in small footprint with analog resolution, timers, and communications for motor control, small appliances, industrial control

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

Small Package Devices

Most new designs use the RS08/S08 devices.

MC9RS08KA	Lowest end MCU, based on RS08 (1.8V to 5.5V)
MC9S08QG	Highly integrated, 1.8V to 3.3V compatible with MC9RS08KA
MC9S08QD	2.7V to 5.5V upwardly compatible from MC9RS08KA

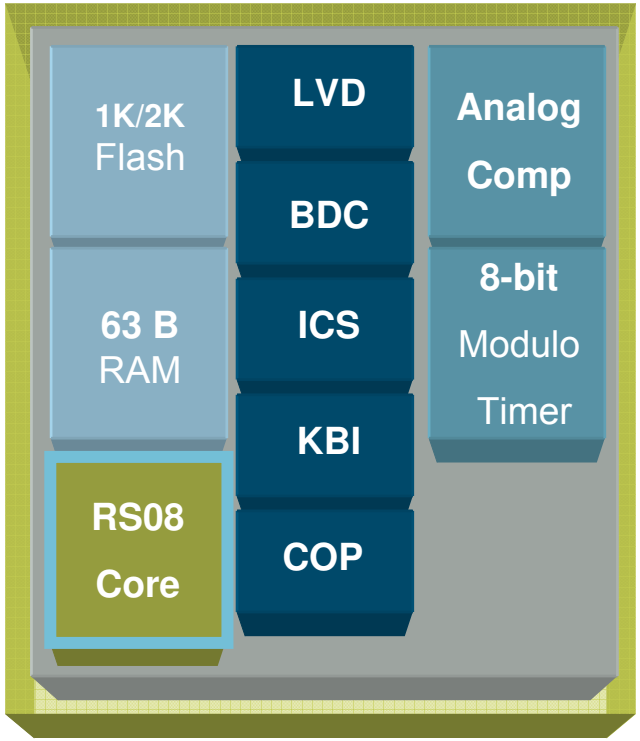
MC908Q family devices provide solid functionality in a variety of low pin count packages

MC908QT	Base Q device with 8-pin packages – 10-bit ADC
MC908QY	Based Q devices 16-pin packages – 10-bit ADC
MC908QB	Larger memory sizes, more ADC channels (10), more timer channels, SCI, and SPI
MC908QC	Larger memory (up to 16K Flash), 2nd independent timer, larger pin count options (up to 28 pins)

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

MC9RS08KA



MC9RS08KA2
MC9RS08KA1

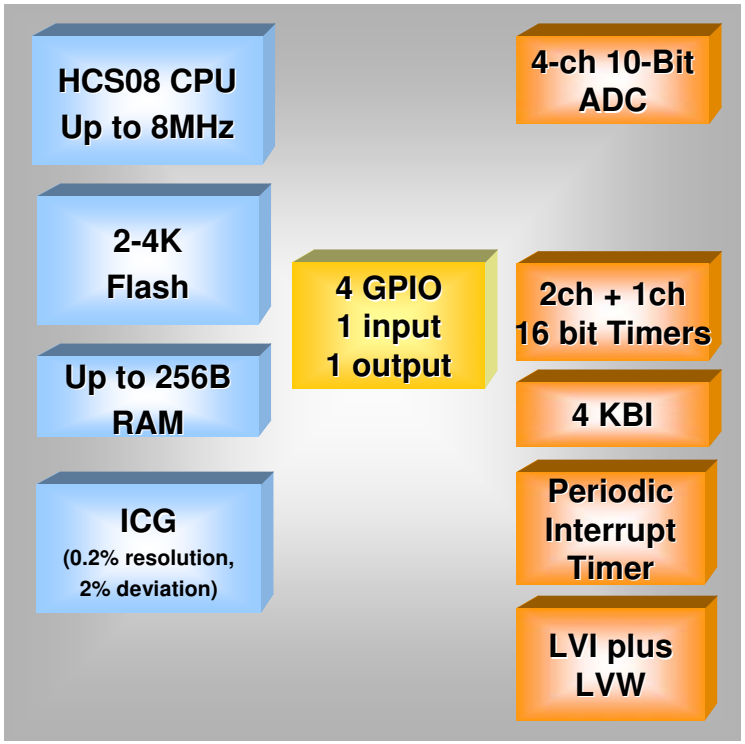
- **Supply Voltage / Performance**
  - *1.8-5.5V*
- **Core**
  - *RS08 Core*
- **Memory**
  - *1K / 2K Flash*
  - *63 B RAM*
- **Analog Comparator**
  - *Full rail-to-rail supply operation*
  - *Can operate in STOP mode*
- **Features/ Benefits**
  - *Integrated Clock Source (ICS) up to 10MHz internal bus operation with 2% deviation over full temperature and voltage range*
  - *Computer operating properly feature (COP)*
  - *8-bit Modulo Timer, Auto wakeup*
  - *3 / 5 channel keyboard interrupt (KBI)*
  - *LVD (low voltage detect) with reset or stop wakeup*
  - *External Vpp required for Flash programming*
- **Fast Track Development Tools**
  - *DEMO9RS08KA2 and Fast Track CodeWarrior v5.1*
- **Packaging**
  - *6 pin DFN, 8 pin NB-SOIC, 8 pin PDIP*
- **Target Applications:**
  - *Small appliance, toys, simple analog comparator / simple logic replacement, HB-LED*

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

9S08QD4

(Low Cost, 8pin, S08)



8 pin SOIC narrow body, 8 pin PDIP
MC9S08QD4CSC …. $0.69/1kpcs

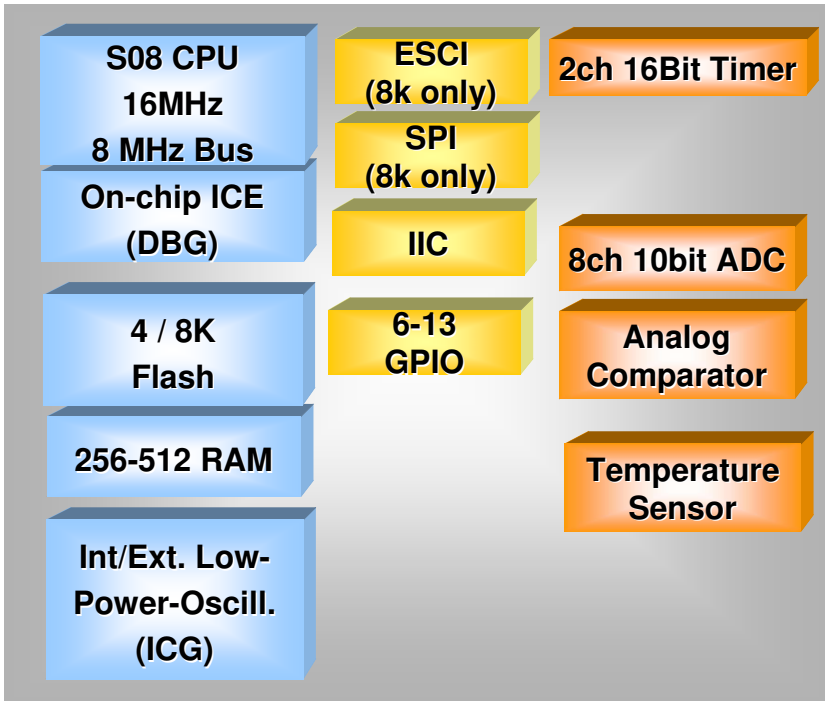
Key Features/Benefits

- **Supply Voltage/ Performance**
  - 4MHz bus @3.0 V ±10%, 8MHz bus @5.0 V ±10%, -40 to 105C
- **Core**
  - *S08 Core*
- **Memory**
  - *2-4K FLASH, 256 RAM*
- **Features/ Benefits**
  - Precision trimming Internal Clock Source provide 0.2% resolution with 2% deviation for full operating temperature and voltage
  - 1 one-channel and 1 two-channel 16-bit Timer with selectable IC, OC, or PWM
  - Computer Operating Properly and LVI with selectable trip point
  - 4 ch, 10-bit Analog to Digital Converter
  - 4 x Keyboard Interrupts
  - Port : 4GPIO, 1 output, 1 input. Slew rate selection is available for all output pins.
  - COP
- **Available Packages**
  - 8 pin SOIC narrow body, 8 pin PDIP
  - Pin compatible to 9S08QG8/4 & 9RS08KA2 (8-pin)
- **Development Tools/ Documentation**
  - H/W: Standard MMEVS, MMDS
  - S/W: The existing CodeWarrior tool suite
- **Target Applications:**
  - DC Fan, CDI, general purpose

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

MC9S08QG8 / QG4



16 pin QFN, TSSOP, PDIP
8 pin DFN, SOIC, PDIP
MC9S08QG4CPAE …. $0.89/1kpcs

Key Features/Benefits

Supply Voltage
- 1.8V – 3.6V, -40C to +125 C

Core
- 16MHz HCS08 Core/ 8MHz Bus Frequency

Memory
- 4kB - 8kB Flash/ 256B - 512B RAM

Communications
- ESCI, SPI, IIC

Features/ Benefits
- 8MHz Internal @ 1.8V – 3.6V
- Flash Read/Write @ 1.8V
- Internal Osc (2% Precision over temperature & frequency)
- On-chip ICE (DBG)
- Background Debug Controller (BDC)
- 2-ch, 16-bit, IC/ OC, or PWM
- COP, 10-bit ADC, ICS with FLL, LVI, RTI
- Up to 13 GPIO
- Power Saving Modes
- On-chip temperature Sensor
- Pincompatibility to 9S08QD4 & 9RS08KA2 (8-pin)

Available Packages
- 16-pin SOIC/TSSOP/PDIP
- 8-pin DFN/SOIC/PDIP

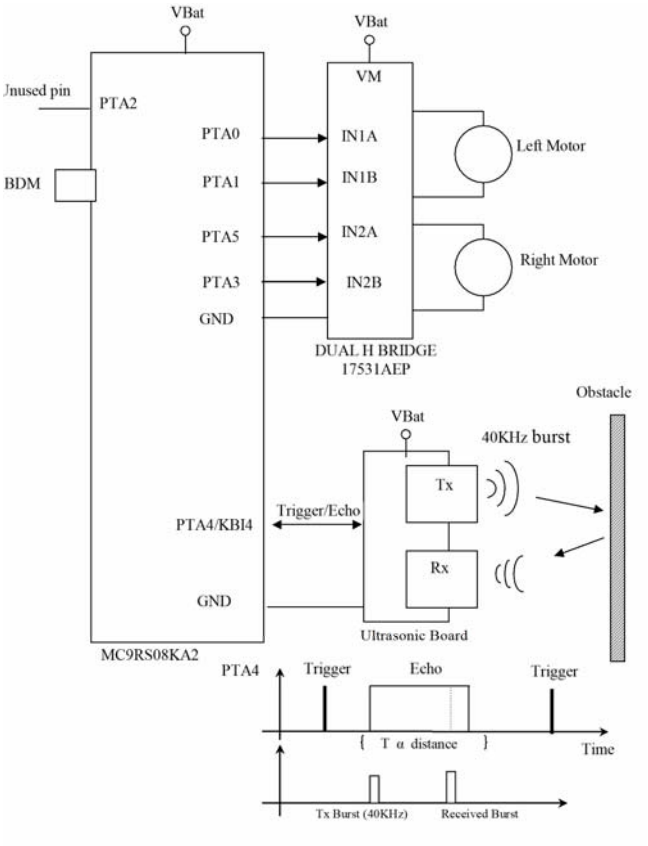
Target Applications:
- Electronic power meters, Sensors, Wireless comm.
- Home appliances, Security systems, etc…

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

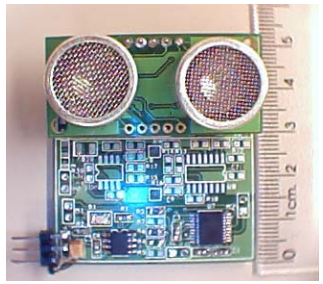
freescale™ semiconductor

KA2 Anti-Crash Robot

The KA2 Anti-Crash Robot is a toy robot that moves by itself and is able to avoid obstacles changing its direction when it approaches an object



	MC9RS08KA2	KA2 Robot
I/O	6	5
Flash	2K	439 Bytes
RAM	64 bytes	9 bytes
Analog Comparator	1	-
KBI	5	1
Bus Clock	Up to 10 MHz	8MHz
MTIM	1	1
RTI	1	1
Package	8 SOIC 6 DFN 8DIP	8 SOIC



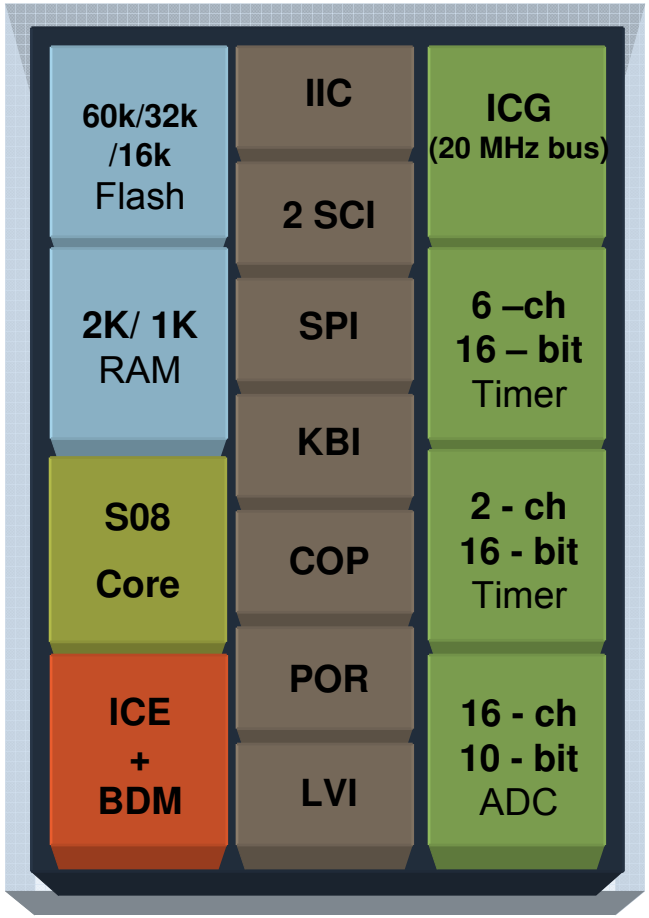
Other applications:

- Distance measurement can be used in an ultrasonic automotive backup warning system.
- Small handheld devices

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

MC9S08AW60/32/16 – Feature Set



1K Unit MSRP:

MC9S08AW60 $5.83
MC9S08AW32 $4.62
MC9S08AW16 $4.07

Features

▶Memory

- 16 - 64 k Flash, capable of EEPROM emulation
- 1k – 2k bytes of RAM

▶Internal Clock Generator (ICG)

- Up to 20 MHz bus
- FLL with 8 software selectable multipliers
- On-chip oscillator – Requires no external components
- Bus clock divider with 8 software selectable settings
- Separate self-clocked source for real time interrupt
- 0.5% typical. 2% accuracy over full operating range

▶Serial Communication

- IIC (synchronous), SPI (synchronous), and 2 SCI (asynchronous)

▶Timers

- 6 - channel Timer/PWM Module (TPM)
- 2 - channel Timer/PWM Module (TPM)

▶Analog Modules

- 16 - ch, 10 - bit Analog-to-digital converter
- Enhanced LVD

▶Development Tools

- On chip ICE and BDM

▶**Available Packages-** 64 QFP, 64 LQFP, 48 QFN, 44 LQFP

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor

MC9S08AWxx Target Applications

- Home Appliance
- Kitchen Appliance
- Automotive
- LIN Applications
- Industrial control
- Security system
- Lighting control

Many other general market applications

OUR CUSTOMERS' IMAGINATION IS THE ONLY LIMIT!

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2006.

freescale™ semiconductor