AUTOMOTIVE FLASH!

Motorola Automotive FLASH Microcontrollers

WHEN IT COMES TO ON-CHIP AUTOMOTIVE FLASH, YOU CAN RELY ON MOTOROLA.

As the #1 supplier of silicon to the automotive market, Motorola's microcontroller solutions form the backbone of millions of cars on the road today. Motorola understands automotive design engineers' unique challenges and requirements, as well as their concerns about time to market, reliability and affordability. Motorola's on-chip Automotive FLASH — built on *DigitalDNA™ technology — is just one of the latest examples of how we're helping designers meet the demands of today's automotive applications and speed them to market while streamlining development costs.

MOTOROLA'S AUTOMOTIVE FLASH: THE SUPERIOR DESIGN SOLUTION.

When you're facing reduced development cycle times, Motorola's single-chip 8-, 16- and 32-bit Automotive FLASH microcontrollers provide the flexibility you need to get your automotive designs into production quickly and efficiently. These cost-effective, off-the-shelf devices eliminate the need for custom masked ROM code and are less costly than external solutions. Plus, they enable easy reprogrammability during design and debug so you can maximize your design resources and respond to changing customer or market requirements fast. And because they can be updated in the field after your application is in production, you eliminate obsolete inventories and scrap modules, as well as the risk of a costly recall of OTPs or ROMs to implement software upgrades.

With the wide range of memory configurations available for 8-, 16-, and 32-bit microcontrollers, Motorola has optimized their FLASH product portfolio to address the full spectrum of automotive applications. From low cost, high density arrays for body electronics systems through to high speed, high density for powertrain applications, Motorola offers the optimal integrated FLASH microcontroller for all your automotive needs.

WHAT MAKES MOTOROLA AUTOMOTIVE FLASH THE SMART CHOICE?

- **The only AEC-qualified FLASH in the business.**
  Motorola Automotive FLASH is AEC-qualified for the full temperature range of -40 to 125º C.
- **Easy, cost-effective programming changes.**
  In-application programmability and reprogrammability saves time and money during design and debug and in the field after production thereby eliminating scrap modules and obsolete inventories as well as allowing you to respond to changing customer and market needs.
- **Reduced production programming costs.**
  Programming up to 100 times faster than most embedded FLASH/EEPROM (2msec for 64 bytes).
- **Flexible block protection and security.**
  Our split-gate FLASH protects code from unauthorized reading and guards against unintentional erasing/writing of user-programmable segments of code.
- **Proven reliability.**
  Motorola currently has more than 17 million Automotive FLASH microcontrollers in the field.
- **Optimized for automotive applications.**
  Our Automotive FLASH memory technology is designed in array sizes from 2 K to 1 Mbytes; you can choose the optimal device for your application.
- **Ability to re-use design across platforms.**
  Our modular design methodology allows quick and easy integration with our advanced microcontroller cores across platforms to meet specific application needs.

DigitalDNA™
from Motorola

8-Bit Automotive FLASH — 68HC08 Family
Application: General body functions, including mirrors, doors, locks and keypads

68HC908AS60/68HC908AZ60
The Best Ever Selling FLASH Product In The Automotive Market
- 60K Bytes In-system Programmable FLASH
- 1K Bytes EEPROM
- 2K Bytes RAM
- 15-Channel, 8-bit Analog-to-Digital Converters
- Asynchronous Serial Communications Interface
- Synchronous Serial Peripheral Interface
- 68HC908AS60
  – 6-Channel Programmable Timer
  – J1850 (VPW) Multiplexing
  – 64 QFP and 52 PLCC Packaging options
- 68HC908AZ60
  – 6-Channel + 2-Channel, Programmable 16-Bit Timers (I/C, O/C, or PWM)
  – CAN 2.0 A and B Multiplexing
  – 64 QFP Package
  – The World's First 8-Bit MCU With Integrated FLASH, EEPROM and CAN

68HC908JL3
- 4 Kbytes In-system Programmable FLASH
- 128 Bytes RAM
- 2-Channel Programmable16-Bit Timers (I/C, O/C or PWM)
- 12-Channel, 8-Bit Analog-to-Digital Converters
- Low Voltage Inhibit (Reset) with Selectable Trip Points
- 6 Pin LED Drive
- 28 Lead DIP and 28 Lead SOIC Package Options

68HC908AB32
- 32 Kbytes In-system Programmable FLASH
- 512 Bytes EEPROM
- 1 Kbyte RAM
- Dual 4-Channel Programmable 16-Bit Timers (I/C, O/C or PWM)
- 8-Channel, 8-Bit Analog-to-Digital Converters
- Asynchronous Serial Communications Interface
- Synchronous Serial Peripheral Interface
- Low Voltage Inhibit (Reset)

- Phase Locked Loop
- Periodic Interrupt Timer
- Up to 51 Bi-directional I/O
- 64 Lead QFP Package

16-Bit Automotive FLASH — 68HC12 Family
Application: Central body and gateway

68HC912DT128A
- 128 Kbytes In-system Programmable FLASH
- 2 Kbytes EEPROM
- 8 Kbytes RAM
- 8-Channel, 16-Bit Enhanced Capture Timer (ECT)
- Dual Asynchronous Serial Communications Interface
- Synchronous Serial Peripheral Interface
- 3 x CAN, 2.0 A and B Multiplexing
- Dual 8-Channel, 10-Bit Analog-to-Digital Converters
- 112 Lead QFP Package
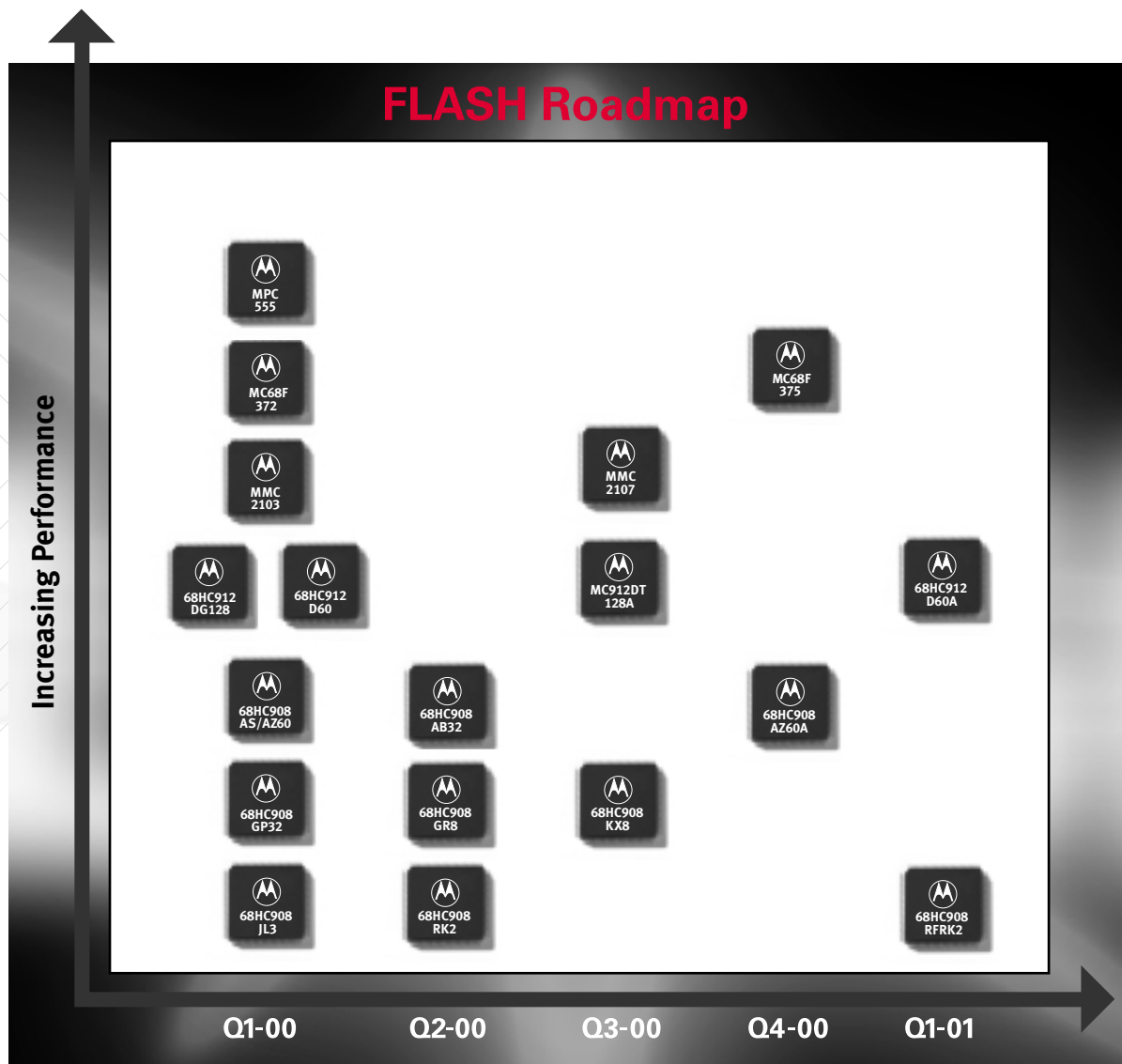
32-Bit Automotive FLASH — 68300 and M•CORE™ Families
Application: Engine control, chassis, transmission and general purpose

MC68F375
- 256 Kbytes In-system Programmable FLASH
- 6 Kbytes RAM
- 8 Kbytes ROM
- 10 Kbytes SRAM
- 10-Bit Queued Analog-to-Digital Converter Module with AMUX
- Dual Asynchronous Serial Communications Interface
- Synchronous Serial Peripheral Interface
- TouCAN – CAN 2.0B Controller Module
- 217 PBGA Package

MMC2107
- 128 Kbytes In-system Programmable FLASH
- 8 Kbytes SRAM
- Dual Asynchronous Serial Communications Interface
- Synchronous Serial Peripheral Interface
- 32-Bit M•CORE microRISC CPU with OnCE™ Debugging Interface
- 8-Channel, 10-Bit Analog-to-Digital Converters
- Dual Periodic Interrupt Timer
- 100 and 144 Lead QFP Package Options

FLASH Roadmap

Increasing Performance

MPC 555			MC68F 375	
MC68F 372		MMC 2107		
MMC 2103				
68HC912 DG128 / 68HC912 D60		MC912DT 128A		68HC912 D60A
68HC908 AS/AZ60	68HC908 AB32		68HC908 AZ60A	
68HC908 GP32	68HC908 GR8	68HC908 KX8		
68HC908 JL3	68HC908 RK2			68HC908 RFRK2

Q1-00   Q2-00   Q3-00   Q4-00   Q1-01

*VISIT OUR WEB SITE AT HTTP://SPS.MOTOROLA.COM/AUTOMOTIVE FOR DETAILS ON OUR EXISTING LINE OF FLASH MICROCONTROLLERS.

THE COMPLETE AUTOMOTIVE FLASH SOLUTION.
In addition to providing a complete family of 8-, 16-, and 32-bit Automotive FLASH devices, Motorola's Automotive solution includes a comprehensive development tools portfolio, applications support, and worldwide manufacturing capabilities.

Development support for Motorola 8-bit FLASH micro-controllers includes an In-Circuit Simulator (ICS) kit that allows you to program and debug your 68HC08 FLASH software code, as well as two fully modular real-time in-circuit development kits, the Motorola Modular Evaluation System (MMEVS) and the high-performance Motorola Modular Development System (MMDS).

For the 68HC12, 68300 and M•CORE™ FLASH family members, Motorola and several independent development tools suppliers offer both hardware and software development tools. These include evaluation boards, emulators, compilers, and debuggers, as well as programmers, cables and adapters. To find out more, visit our complete listing of development tool information at http://www.mcu.motsps.com/mdtcoi/index.html.

MOTOROLA'S COMMITMENT TO ON-CHIP AUTOMOTIVE FLASH.

With its revolutionary capabilities for speeding development and making memory implementation more cost-effective, on-chip FLASH clearly represents the future of automotive microcontroller technology. As the preferred microcontroller supplier to the automotive industry, Motorola is leading the migration to FLASH memory. Currently, more than 100 technology and development engineers in Motorola's Non-Volatile Memory Technology Center are working to expand next-generation FLASH into more automotive microcontrollers. Their goals include driving feature size down to submicron technologies. This will make using Motorola on-chip FLASH solutions even more cost-effective in automotive applications.

EXPERIENCE THE BENEFITS OF MOTOROLA AUTOMOTIVE FLASH.

As the first semiconductor manufacturer to ship volume production FLASH microcontrollers, Motorola has long been the leader in embedded FLASH technology. What does that mean to you exactly? Comprehensive solutions — the chips, systems, software, development tools, and technical support — plus the automotive expertise to help you seamlessly migrate your designs to Motorola's Automotive FLASH microcontrollers and start experiencing the benefits of on-chip FLASH today!

- Fast, easy programming allowing the maximization of design resources
- Reduction or elimination of scrap modules and obsolete inventories
- Ability to quickly respond to changing market and customers needs
- AEC-qualified across full-temperature range
- Optimized for automotive applications
- Ability to re-use design across platforms

To find out more about Motorola 8-, 16-, and 32-bit Automotive FLASH — and how it can save you time and money on your next application — call your Motorola sales representative or authorized distributor, or visit our website at http://sps.motorola.com/automotive.

HTTP://SPS.MOTOROLA.COM/AUTOMOTIVE

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