

## Product Brief

### TOTAL5200™ DEVELOPMENT PLATFORM FOR 400 MHZ 760 MIPS MPC5200

#### OVERVIEW

The Total5200 Development Platform is designed for fast set-up and installation, to help you be productive in minutes. It offers a comprehensive evaluation package for QNX software, including Motorola developed, optimized, and supported device-level drivers, libraries, and sample applications. IBM WebSphere® Device Developer Java IDE®, the WebSphere Micro Environment, and WebSphere Custom Environment J9 Virtual Machine are also included. Board Support Packages are also planned for Green Hills INTEGRITY®, MontaVista® Linux®, and Wind River VxWorks®.

#### BENEFITS

The Total5200™ Development Platform for the 760 MIPS, low-power MPC5200 processor, which contains a PowerPC® core, offers a wide choice of Board Support Packages (BSPs) and virtually all the hardware components you need to quickly develop scalable software solutions while saving valuable software integration time and the associated costs. The rich set of I/O available on the MPC5200 processor has been further expanded on the Total5200 with a comprehensive graphics and audio subsystem and sufficient I/O resources for nearly any project.

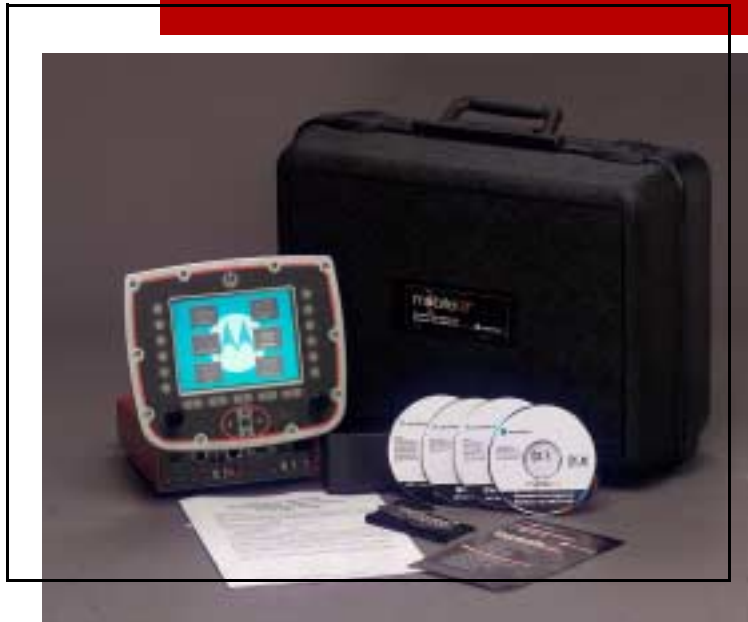
#### DEVELOPMENT TEMPLATES

The Total5200 Development Platform is self-configurable to your development environment through the use of scripts and utilities. A fully networked image using NFS, CIFS, and TCP/IP is supplied allowing you to compile on your host and run on your target, all through an Ethernet connection—easy and fast! System configuration examples along with build files for hardware supported configurations are included.

#### SYSTEM SUMMARY

The Total5200 Development Platform is a comprehensive solution for developers of rapid prototypes of systems with graphics, audio or extensive I/O. Electronic/medical instrumentation, network gateways, video detection/analysis, industrial automation, or systems using audio, Bluetooth™ wireless technology or voice recognition are potential targets. Telematics, camera-based event monitoring, driver information systems, navigation systems, automotive gateways, hands-free phone modules and other automotive-centric applications are also candidates. For systems not requiring all the features of the Total5200 Development Platform, the Lite5200™ Evaluation Board offers an excellent solution.

The system may be powered directly with 12VDC (optional International AC adapter included). A DIN-sized main board offers comprehensive hardware utilities, including a repositionable touchscreen graphics display, audio subsystem, automotive networking I/O including CAN and Media Oriented Systems Transfer (MOST)®, as well as connectivity to wireless subsystems, such as cellular, Bluetooth™, or IEEE 802.11, and a rich set of varied I/O to accommodate a wide variety of designs.

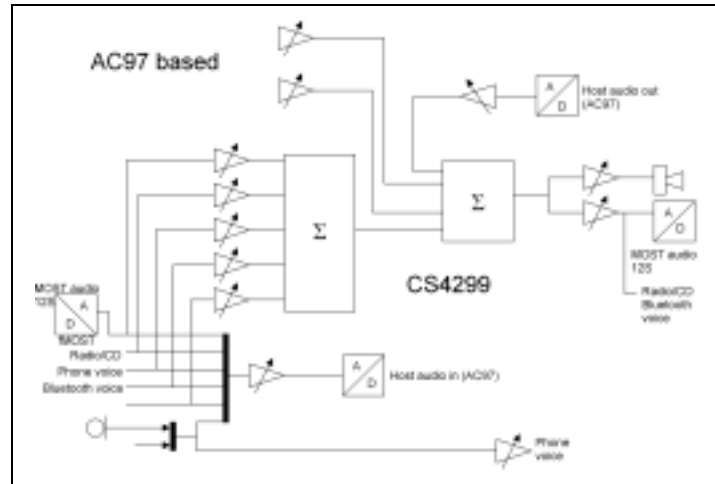


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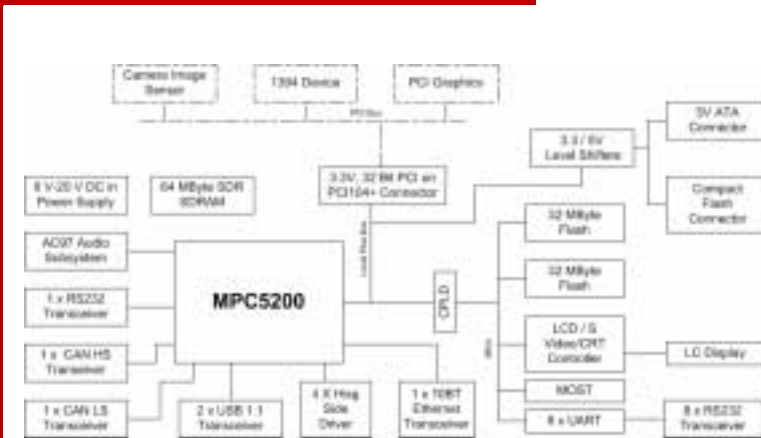
### AUDIO SUBSYSTEM DAUGHTER CARD

- Audio subsystem based on Crystal CS4299 CODECs
- Full connectivity to car radio
- Two microphone inputs, Bluetooth™ wireless technology, stereo, radio, phone, MOST/Video, aux and line inputs
- 16-bit stereo speaker out
- Headphone out
- Amplifier
- On-board A/Ds

### Audio Subsystem Daughter Card Block Diagram



### Total5200 Block Diagram



### SINGLE-CHIP, HIGHLY INTEGRATED 32-BIT PROCESSOR WITH FPU AND POWERPC CORE

- 400 MHz, one watt MPC5200 processor containing a PowerPC core
- 603e RISC Core with Floating Point Unit (FPU), crucial for GPS, Video Image Processing, Voice Recognition/Text-to-Speech, and other algorithm-intensive operations
- 760 MIPS @ 400 MHz for plenty of application headroom
- Ethernet, Dual CAN, I<sup>2</sup>C, I<sup>2</sup>S, Serial, USB, SPI, AC97, COP/JTAG, J1850, PCI, ATA, DDR memory controller *on-chip* for easy expansion, MOST, and audio subsystem off-chip
- On-chip BestComm DMA I/O Control reduces CPU I/O management overhead
- -40 to +85C Automotive Qualified, QS9000 Certified helps to assure production quality and long-term availability

### COMPREHENSIVE ON-CHIP I/O

- Multi-Serial (UART) for maximum design flexibility
- SPI (useful for Touchscreen, A/D Input, etc.)
- Dual USB Master 1.1 with OHCI support
- Dual CAN 2.0A/B (high speed and low speed fault tolerant, standard and extended frames, programmable bit rate to 1 Mbps)
- Ethernet 10/100 BaseT (7 Wire Industrial Standard Interface 10 BaseT implemented)
- Dual I<sup>2</sup>C (to 520 Kbps) for thermometer, interchip and DSP communication, E<sup>2</sup>PROM, etc.
- Version 4 5V ATA (Compact Flash with True IDE mode)
- PCI Interface with PC104+ connector plus separate PCI clock drivers
- AC97 Audio Codec Interface
- Multiple, reconfigurable GPIO pins

### TOTAL5200 Target Hardware System



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Go to: [www.freescale.com](http://www.freescale.com)

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## DEVELOPMENT SYSTEM EXPANSION I/O EXTENDS WITH THE FOLLOWING:

- Expansion for PCI ATA/IDE and Flash Card
- Expansion to 9 serial channels
- Expansion for extra GPIO lines
- MOST subsystem (asynchronous / synchronous in parallel combined mode) using Oasis OS8104AQR
- DSP co-processor interface
- Comprehensive audio subsystem based on Crystal CS4299 CODECs
- Comprehensive touchscreen graphics display support based on the Epson S1D13806; additional S-video and CRT outputs



*Front Panel Connections*

## CONNECTORS

NAME	DESCRIPTION	PHYSICAL CONNECTOR
JTAG Programming	Classic interface for Xilinx JTAG	10 pin PCB header
COP	Standard COP	8 x 2 pin PCB header
MOST	Media Oriented Systems Transport	Bigfoot connector, 2-way
USB (x2)	Universal Serial Bus (x2)	Dual USB connector
CAN (HS)	High Speed Controller Area Network (CAN)	10-pin PCB header
CAN (LS)	Low speed fault tolerant CAN	10-pin PCB header
Wakeup	Wakeup from Sleep Mode	Minifix connector (5x2)
GPIO	8 bits of General Purpose I/O	Minifix connector (5x2)
Timer	Timers/Input catch/Output compare/PWM	Minifix connector (5x2)
Touch screen	4-wire resistive touch screen input	5 pin PCB header
LCD Power	5V power for TFT-LCD twin backlights	5 pin PCB header
SPI	Serial Peripheral Interface	4 pin PCB header
LCD	Thin-film-transistor Liquid Crystal Display	32 pin Hiroshi connector
LCD GPIO	General Purpose I/O on Epson LCD controller	10-pin PCB header
UART0	Serial Port that supports HW Flow control	DB9, male
UART1	Serial Port with comprehensive MODEM signals	Minifix connector (5x2)
UART 2+3	Serial Ports (2) that support SW Flow control	Minifix connector (5x2)
UART 4	Serial Port that supports HW Flow control	Minifix connector (5x2)
UART 5+6	Serial Ports (2) that support SW Flow control	Minifix connector (5x2)
UART 7+8	Serial Ports (2) that support SW Flow control	Minifix connector (5x2)
Button Interface	Panel Button Interface control	Minifix connector (5x2)
Ethernet	10 BaseT Ethernet	10-pin RJ-45 jack
Compact Flash	External Flash memory card	50 pin Compact Flash slot
ATA	Ultra ATA 100 (Ultra Direct Memory Access)	40 pin ATA slot
PC104	Slots for stackable PC-104 sized card	4 x 30 (120) slot connector
Bluetooth™ audio	Audio output for Bluetooth™ wireless technology	Stereo Jack – 2.5mm
Phone	Audio I/O for telephone	Stereo Jack – 2.5mm
AUX IN	Audio input from auxiliary source	Stereo Jack – 3.5mm
MOST/Video	Audio output to MOST system	Stereo Jack – 3.5mm
Radio IN	Audio input from radio source	RCA Jacks (left and right)
Mono-Microphone 1	Audio input from microphone with amplifier	Stereo Jack – 3.5mm
Mono-Microphone 2	Audio input from microphone	Stereo Jack – 3.5mm
Line-level IN	Line-level input (2 channels)	Stereo Jack – 3.5mm
Headphone	Audio output to headphones	Stereo Jack – 3.5mm
Speaker OUT	Audio output to external speakers	RCA Jacks (left and right)
S-Video	S-Video standard video output	S-Video Mini DIN connector
VGA	Video Graphics Adapter output	15-pin VGA connector

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## MEMORY

- 64 Mbytes SDRAM, processor can also support Double Data Rate (DDR) memory
- 64 Mbytes Flash organized as 2 x 32 bit-wide banks

## DIMENSIONS

- Board enclosure: 186mm x 180mm x 84mm
- Main board: 172mm (width) x 165mm (depth), excluding connectors
- Audio subsystem board: 172mm (width) x 60mm (depth), excluding connectors
- Power subsystem board: 172mm (width) x 60mm (depth)
- Touchscreen graphics display head: 213mm x 175mm x 57mm

## ON-BOARD POWER MANAGEMENT

- Support of MPC5200 Sleep (real-time clock only) modes
- Sequenced power on (1.5, 2.5, 3.3 then 5V sequence)
- SDRAM self refresh
- Selective transceiver shutdown
- DC/DC converters stay on with minimal load
- ATA level shifters enabled only by ATA chip select

## TECHNICAL SUPPORT

Various standard training courses are available. Annual technical support contracts are available to help keep projects on track. For further product development, support contracts can be customized to meet specific training, consulting, or custom engineering needs.

Total5200 Development Platform with 30-Day Software Evaluation License: Part#: MPCSYS5200EVAL

Description: The Total5200 Development Platform includes the Total5200 hardware and all software for a comprehensive development environment. It includes a 30-day evaluation copy of the QNX SDK and the Momentics IDE for developing software applications. The Total5200 SDP CD contains a QNX BSP with optimized Motorola-specific I/O drivers for QNX. IBM WebSphere is also included for Java development.

Price: \$5,000 each supplier

- Access for additional MPC5200 Information: <http://e-www.motorola.com> or <http://www.mobilegt.com/>
- Access for additional Green Hills INTEGRITY Information: <http://www.ghs.com/>
- Access for additional MontaVista Linux Information: <http://www.mvista.com/>
- Access for additional QNX Information: <http://www.qnx.com/>
- Access for additional Wind River VxWorks Information: <http://www.windriver.com/>
- Access for IBM WebSphere Device Developer Java IDE: <http://www-3.ibm.com/software/wireless/wsdd/>

Additional documentation:

- 760 MIPS MPC5200 Lite5200: MPC5200LITEPB/D
- mobileGT SDP Product Brief: MOBILEGT5200PB/D
- MPC5200 Technical Summary: MPC5200TS/D

Motorola SPS General Customer Technical Call Center:  
1 (800) 521-6274

## COLOR GRAPHIC HEAD UNIT

- 16-bit TGT LCD controller (640 x 800, 64K colors) based on Epson S1D13806
- 6.5 in. TFT color LCD display; 640 x 480 pixels; 262,144 colors
- 16 general purpose buttons; two general purpose rotary-push knobs; five navigation buttons
- Resistive touch screen

## POWER REQUIREMENTS

- Single 12VDC @ 2A direct automotive connection (designed to accommodate 6-20V). 120VAC Power Adapter Included
- All required voltages derived from single source
- 2.5 A fuse
- 1.5V, 2.5V, 3.3V, and 5V rails may be introduced separately, if desired

## TOTAL5200 DEVELOPMENT PLATFORM CONTENTS

- Standard Development Platform CD from Motorola
- QNX Momentics Professional Edition Evaluation CD
- IBM WebSphere Studio Device Developer SDK
- Motorola DIN1 form-factor hardware system with integrated graphics display and power supply
- Documentation

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