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Applications of "<u>Embedded -</u> <u>Microcontrollers</u>"

#### Details

Product Status	Obsolete
Core Processor	PowerPC
Core Size	32-Bit Single-Core
Speed	40MHz
Connectivity	CANbus, EBI/EMI, SCI, SPI, UART/USART
Peripherals	POR, PWM, WDT
Number of I/O	56
Program Memory Size	1MB (1M x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	36K x 8
Voltage - Supply (Vcc/Vdd)	2.5V ~ 2.7V
Data Converters	A/D 40x10b
Oscillator Type	External
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	388-BBGA
Supplier Device Package	388-PBGA (27x27)
Purchase URL	https://www.e-xfl.com/product-detail/nxp-semiconductors/mpc566czp40

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#### **Product Brief**

MPC565PB/D Rev. 3, 2/2003

MPC565/MPC566 Product Brief



**MOTOROLA** intelligence everywhere<sup>\*</sup>

digitaldna

This document provides an overview of the MPC565/MPC566 microcontrollers, including a block diagram showing the major modular components, sections that list the major features, and differences between the MPC565/MPC566 and the MPC555. The MPC565 and MPC566 devices are members of the Motorola MPC500 RISC Microcontroller family. The parts herein will be referred to only as MPC565 unless specific parts need to be referenced.

#### Table 1. MPC565/MPC566 Features

Device	Flash	Code Compression
MPC565	1 Mbyte	Code compression not supported
MPC566	1 Mbyte	Code compression supported

### 1 Introduction

The MPC565 device offers the following features:

- PowerPC<sup>TM</sup> core with a floating point unit (FPU) and a burst buffer controller (BBC)
- Unified system integration unit (USIU), a flexible memory controller, and improved interrupt controller
- 1 Mbyte of Flash memory (UC3F)
  - Typical endurance of 100,000 write/erase cycles @ 25°C
  - Typical data retention of 100 years @ 25°C
- 36 Kbytes of static RAM (two CALRAM modules)
  - 8 Kbytes of normal access or overlay access (sixteen 512-byte regions)
  - 4 Kbytes in CALRAM A, 4 Kbytes in CALRAM B
- Three time processor units (TPU3)
  - TPU3 A and TPU3 B are connected to DPTRAM AB (6 Kbytes)
  - TPU3 C is connected to DPTRAM C (4 Kbytes)
- A 22-timer channel modular I/O system (MIOS14)
  - Same as MIOS1 plus a real-time clock sub-module (MRTCSM), 4 counter sub-modules (MCSM), and 4 PWM sub-modules (MPWMSM)
- Three TouCAN modules (TouCAN\_A, TouCAN\_B, and TouCAN\_C)
- Two enhanced queued analog to digital converters (QADC64E A, QADC64E B) with analog multiplexers (AMUX) for 40 total analog channels. These modules are configured so each module can access all 40 of the analog inputs to the part.

- Two queued serial multi-channel modules (QSMCM A, QSMCM B), each of which contains a queued serial peripheral interface (QSPI) and two serial controller interfaces (SCI/UART)
- -40°C 125°C ambient temperature, -40°C 85°C for suffix C devices, -55°C 125°C for suffix A devices
- Debug features:
  - A J1850 (DLCMD2) communications module
  - A Nexus debug port (class 3) IEEE-ISTO 5001-1999
  - JTAG and background debug mode (BDM)
- Packaging and Electrical

## 1.1 Block Diagram

Figure 1 is a block diagram of the MPC565.

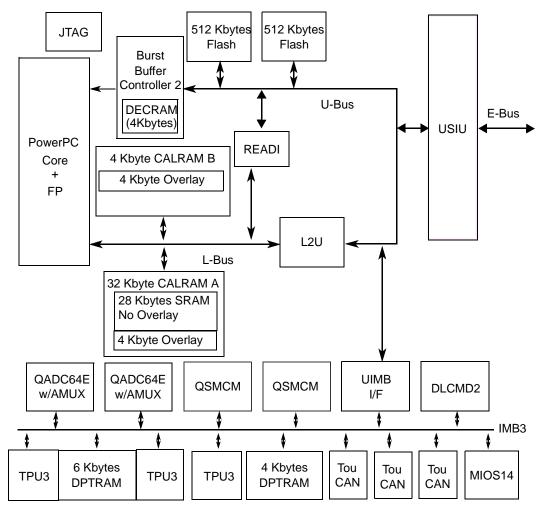


Figure 1. MPC565 Block Diagram

Semiconductor, Inc.

Freescale



## **1.2 Detailed Feature List**

The MPC565 key features are explained in the following sections.

## 1.2.1 High Performance CPU System

- Fully static design
- Four major power saving modes
  - On, doze, sleep, deep-sleep and power-down

## 1.2.2 RISC MCU Central Processing Unit (RCPU)

- High-performance core
  - PowerPC single issue integer core
  - Precise exception model
  - Floating point
  - Code compression (MPC566 only)
    - Compression reduces usage of internal or external Flash memory
    - Compression optimized for automotive (non-cached) applications
    - New compression scheme decreases code size to 40% –50% of source

## 1.2.3 MPC500 System Interface (USIU)

- MPC500 system interface (USIU, BBC, L2U)
- Periodic interrupt timer, bus monitor, clocks, decrementer and time base
- Clock synthesizer, power management, reset controller
- External bus tolerates 5-V inputs, provides 2.6-V outputs
- Enhanced interrupt controller supports a separate interrupt vector for up to eight external and 40 internal interrupts
- IEEE 1149.1 JTAG test access port
- Bus supports multiple master designs
- USIU supports dual-mapping of Flash to move part of internal Flash memory to external bus for development
- External bus, supporting non-wraparound burst for instruction fetches, with up to 8 instructions per memory cycle

## 1.2.4 Burst Buffer Controller (BBC) Module

- Exception vector table relocation features allow exception table to be relocated to following locations:
  - 0x0000 0000 0x0000 1FFF (normal MPC500 exception table location)
  - 0x0001 0000 0x0001 1FFF (0 + 64 Kbytes; second page of internal Flash)
  - Second internal Flash module
  - Internal SRAM
  - 0x0FFF\_0100 (external memory space; normal MPC500 exception table location)

**Detailed Feature List** 

## 1.2.5 Flexible Memory Protection Unit

- Flexible memory protection units in BBC (IMPU) and L2U (DMPU)
- Default attributes available in one global entry
- Attribute support for speculative accesses

## 1.2.6 Memory Controller

- Flexible chip selects via memory controller
- 24-bit address and 32-bit data buses
- 4- to 16-Mbyte (data) or 4-Gbyte (instruction) region size support
- Four-beat transfer bursts, two-clock minimum bus transactions
- Use with SRAM, EPROM, Flash and other peripherals
- Byte selects or write enables
- 32-bit address decodes with bit masks
- Four instruction regions
- Four data regions

## 1.2.7 1 Mbyte of CDR3 Flash EEPROM Memory (UC3F)

- 1 Mbyte Flash
  - Two UC3F modules, 512 Kbytes each
- Page mode read
- Block (64-Kbyte) erasable
- External 4.75- to 5.25-V VPP program and erase power supply
- Typical endurance of 100,000 write/erase cycles @ 25°C
- Typical data retention of 100 years @ 25°C

## 1.2.8 36-Kbyte Static RAM (CALRAM)

- 36-Kbyte static calibration RAM
  - Composed of 4-Kbyte and 32-Kbyte CALRAM modules
- Fast access: one clock
- Keep-alive power
- Soft defect detection (SDD)
- 4 Kbyte calibration (overlay) RAM per module (8 Kbytes total)
- Eight 512-byte overlay regions per module (16 regions total)

## 1.2.9 General Purpose I/O Support (GPIO)

- General-purpose I/O support
- Address (24) and data (32) pins can be used as GPIO in single-chip mode
- 16 GPIO in MIOS14
- Many peripheral pins can be used as GPIO when not used as primary functions
- 5-V outputs with slew rate control

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### 1.2.10 Debug Features

- Extensive system debug support
- On-chip watchpoints and breakpoints
- Program flow tracking
- Background debug mode (BDM)

### 1.2.10.1 Nexus Debug Port (Class 3)

- Nexus/IEEE ISTO 5001-1999 debug port (Class 3)
- Nine- or 16-pin interface

### 1.2.10.2 Message Data Link Controller (DLCMD2) Module

- Two pins muxed with QSMCMB pins. Muxing controlled by QSMCMB PCS3 pin assignment register
- SAE J1850 Class B data communications network interface compatible and ISO compatible for low-speed (<125 Kbps) serial data communications in automotive applications
- 10.4 Kbps variable pulse width (VPW) bit format
- Digital noise filter, collision detection
- Hardware cyclical redundancy check (CRC) generation and checking
- Block mode receive and transmit supported
- 4x receive mode supported (41.6 Kbps)
- Digital loopback mode
- In-frame response (IFR) types 0, 1, 2, and 3 supported
- Dedicated register for symbol timing adjustments
- Inter-module bus 3 (IMB3) slave interface
- Power-saving IMB3 stop mode with automatic wakeup on network activity
- Power-saving IMB3 CLOCKDIS mode
- Debug mode available through IMB3 FREEZE signal or user controllable SOFT\_FRZ bit
- Polling and IMB3 interrupt generation with vector lookup available

## 1.2.11 Integrated I/O System

• True 5-V I/O

### 1.2.11.1 Time Processor Units (TPU3)

- Three time processing units (TPU3)
  - 16 channels each
- Each TPU3 is a microcoded timer subsystem
- One 6-Kbyte and one 4-Kbyte dual-port TPU RAM (DPTRAM), one (6-Kbyte) shared by two TPU3 modules for TPU microcode and the 4-Kbyte dedicated to the third TPU3 for microcode.



**Detailed Feature List** 

### 1.2.11.2 22-Channel Modular I/O System (MIOS14)

- 22-channel MIOS timer (MIOS14)
- Six modulus counter submodules (MCSM)
  - Four additional MCSM submodules compared to MIOS1
- 10 double action submodules (DASM).
- 12 dedicated PWM submodules (PWMSM)
  - Four additional PWM submodules compared to MIOS1 (shared with MIOS GPIO pins)
- MIOS real-time clock submodule (MRTCSM) provides low power clock/counter
  - Requires external 32-KHz crystal
  - Uses four pins: two for 32-KHz crystal, two for power/ground.

### 1.2.12 Two Enhanced Queued Analog-to-Digital Converter Modules (QADC64E)

- Two enhanced queued analog to digital converters (QADC64E A, QADC64E B) with AMUXes for 40 total analog channels.
- 10 bit A/D converter with internal sample/hold
  - Typical conversion time is 4 µs (250-Kbyte samples/sec)
  - Two conversion command queues of variable length
- Automated queue modes initiated by:
  - External edge trigger/level gate
  - Software command
  - Periodic/interval timer, assignable to both queue 1 and 2
- 64 result registers in each QADC64E module
  - Output data is right or left justified, signed or unsigned
- Synchronized clock mode allows both QADC64Es to see the same conversion clock. This allows the two modules to look like one large QADC with four queues.
- Conversions alternate reference (ALTREF) pin. This pin can be connected to a different reference voltage

## 1.2.13 Three CAN 2.0B Controller (TouCAN) Modules

- Three TouCAN modules (TouCAN\_A, TouCAN\_B, and TouCAN\_C)
- 16 message buffers each, programmable I/O modes
- Maskable interrupts
- Programmable loopback for self-test operation
- Independent of the transmission medium (external transceiver is assumed)
- Open network architecture, multimaster concept
- High immunity to EMI
- Short latency time for high-priority messages
- Low power sleep mode, with programmable wake up on bus activity
- TouCAN\_C pins shared with MIOS14 GPIO pins



### 1.2.14 Queued Serial Multi-Channel Modules (QSMCM)

- Two queued serial modules with one queued-SPI and two SCI each (QSMCM\_A, QSMCM\_B)
  - QSMCM\_A matches full MPC555 QSMCM functionality
  - QSMCM\_B has pins muxed with DLCMD2 module
    - Two pins are muxed with DLCMD2 (J1850) transmit and receive pins (B\_PCS3\_J1850\_TX and B\_RXD2\_J1850\_RX)
    - QSMCM B vs J1850 mux control provided by QPAPCS3 bit in QSMCM pin assignment register (PQSPAR)
- Queued-SPI
  - Provides full-duplex communication port for peripheral expansion or interprocessor communication
  - Up to 32 preprogrammed transfers, reducing overhead
  - Synchronous serial interface with baud rate of up to system clock / 4
  - Four programmable peripheral-select pins support up to 16 devices
  - Special wrap-around mode allows continuous sampling of a serial peripheral for efficient interfacing to serial analog-to-digital (A/D) converters
- SCI

•

- UART mode provides NRZ format and half- or full-duplex interface
- 16 register receive buffer and 16 register transmit buffer on one SCI
- Advanced error detection, and optional parity generation and detection
- Word length programmable as 8 or 9 bits
- Separate transmitter and receiver enable bits, and double buffering of data
- Wake-up functions allow the CPU to run uninterrupted until either a true idle line is detected, or a new address byte is received

## **1.2.15 Electrical Specifications and Packaging**

- 40 MHz operation (56 MHz operation is optional for the MPC566)
- -40°C 125°C ambient temperature, -40°C 85°C for suffix C device, -55°C 125°C for suffix A devices
- $2.6 \text{ V} \pm 0.1 \text{ V}$  external bus
  - External bus is compatible with external memory devices operating from 2.5 V to 3.4 V.
  - Extended voltage range (2.7 3.4 V) degrades data drive timing by 1.1 ns on date writes.
- $2.6 \pm 0.1$  V internal logic
- 5-V I/O  $(5.0 \pm 0.25 \text{ V})$
- Available in package or bumped die
- Plastic ball grid array (PBGA) packaging
  - 388 ball PBGA
  - 27 mm x 27 mm body size
- 1.0 mm ball pitch



.MPC565 Optional Features

#### **MPC565 Optional Features** 1.3

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The following features of the MPC565 are optional features and may not appear in certain configurations:

- 56-MHz operation (40-MHz is default)
- MPC566 supports code compression ٠

#### 2 Differences between the MPC565 and the MPC555

The MPC565 is an enhanced version of the MPC555. Most functional features of the MPC555 are unchanged on the MPC565. Table 2 shows the high level differences.

٦	able 2. Differences Between Modules of the MPC555 a	nd the MPC565

Module	MPC555	MPC565					
CPU Core	No C	hange					
BBC	BBC	BBC with improved code compression <sup>1</sup>					
L2U	No C	hange					
SRAM	26-Kbytes	36-Kbyte CALRAM with overlay features					
Flash	448-Kbyte CMF	1-Mbyte UC3F (new programming, etc.)					
USIU	USIU	USIU with enhanced interrupt controller					
JTAG	No C	Change					
READI	None	New Module					
UIMB	No C	hange					
QADC64	2 QADC64 (16 channels on each QADC for 32 total channels)	2 QADC64E w/AMUXes ( 40 channels accessible from either QADC64E)					
QSMCM	(1) No C	hange (2)					
DLCMD2 (J1850)	None	1					
MIOS	MIOS1	MIOS14: MIOS1 with real-time clock (MRTCSM), 4 more PWMSMs and 4 more MCSMs					
TouCAN	(2) No C	hange (3)					
TPU3	(2) No C	hange (3)					
DPTRAM	(6-Kbytes) No Change	e (6-Kbytes, 4-Kbytes)					
	Power Supplies						
_	40 MHz with two power supplies: nominal 3.3-V to 5.0-V power supplies	56 MHz with two power supplies: 5.0-V I/O, 2.6-V internal logic					

1 Available on some options.

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## 2.1 Additional MPC565 Differences

The following are additional differences between the MPC555 and the MPC565.

- SPI (MISO, MOSI, and SCK) pin drive.
  - MPC565 provides 21-ns rise/fall with 200-pf load using CMOS (20%/70%) levels
- GPIO on MODCK1 pin outputs only 2.6 V
  - MODCK1 pin is in keep-alive power section with no 5-V rail available
  - 5.0-V compatibility modes
    - Input is 5-V friendly
    - 2.6-V output has less slew rate control
    - 2.6-V: VOH = 2.3 V
- Power supplies for external bus pins
  - QVDDL is quiet supply to hold non-switching outputs quiet even when noisy supply (NVDDL) sags
  - QVDDL supplies pre-drive and other pad logic
  - NVDDL only supplies final PMOS driver stage
  - QVDDL and NVDDL shorted on customer board after filtering
- Pull-up and pull-down changes during PORESET and HRESET
  - All 2.6-V/5-V pads (external bus: address/data/control) pull down at reset
  - All 5-V pads pull up at reset
  - Additional control granularity in the PDMCR register
- No pull-ups on QSMCM SCI receive pads
- A\_RXD1\_QGPI1, A\_RXD2\_QGPI2, B\_RXD1\_QGPI1 pins do not have weak pull-up during reset or any other time
- CLKOUT has 3 drive strength options
  - Better matches drive to requirements to reduce EMI
  - 25, 50, 100 pf instead of 45 and 90 pf
- Change reset value of ENGCLK to maximum divide (crystal/128)
  - For a 4-MHz crystal, this is 31.25 KHz
    - ENGCLK is selectable between 2.6 V and 5 V
- A daisy chain between UC3F modules allows either module to provide the reset configuration word (RCW)
- Censorship operation
  - A RCW bit controls whether or not the entire UC3F can be erased while censorship is violated
- BBC SPRs (PPC regs) access in two clocks instead of one clock
- CALRAM internal protection block size is 8 Kbytes
  - Instead of 4 Kbytes on MPC555 LRAM
- CALRAM causes machine check exception instead of data storage interrupt (DSI) exception in certain cases
  - For non-overlay CPU core accesses, a DSI exception is taken
  - For overlay accesses and any non-core access (slave mode), a machine check exception is taken

Additional MPC565 Differences

- CALRAM causes DSI exception only if the data relocation (DR) bit in the core machine state register, MSR[DR], is set.
  - L2U on MPC555 already followed this protocol, but the LRAM did not. Now all L-bus peripherals follow this protocol.
  - The MSR[DR] bit is described in the reference manual for more information.
- Four additional PRDS control bits were added to the USIU to allow more granularity of PRDS control on a part
- BBC includes a 4-Kbyte DECRAM that can be used if compression is not used or is not available.

## 3 SRAM Keep-Alive Power Behavior

The SRAM has three keep-alive power pins (VDDSRAM1, VDDSRAM2, and VDDSRAM3). These pins provide keep-alive power to the SRAM arrays in the CALRAM modules and the DPTRAM modules.

The VDDSRAM1 pin powers the 32-Kbyte CALRAM A during keep-alive while power is off to the MPC565 (except for the keep-alive power supplies). CALRAM A keeps all of its 32 Kbytes powered during power down.

The VDDSRAM2 pin powers the 4-Kbyte CALRAM B module. The VDDSRAM3 pin powers the DPTRAM modules during keep-alive as well as during normal operation. The CALRAM modules only power their arrays from the VDDSRAM pins during keep-alive. During normal operation, they are powered by the normal internal VDD of the part.

The DPTRAM modules (6 Kbytes and 4 Kbytes) and the 4-Kbyte DECRAM in the BBC module power their arrays via the VDDSRAM3 pin during keep-alive and are supplied by VDD during normal operation.

## 4 MPC565 Memory Map

The internal memory map is organized as a single 4-Mbyte block. This is shown in Figure 3. This block can be moved to one of eight different locations. The internal memory space is divided into the following sections:

- Flash memory (1 Mbyte) U-bus memory
- Static RAM memory (36 Kbytes CALRAM) L-bus memory
- Control registers and IMB3 modules (64 Kbytes), partitioned as
  - USIU and flash control registers
  - UIMB interface and IMB3 modules
  - CALRAM and READI control registers (L-bus control register space)

The internal memory block can reside in one of eight possible 4-Mbyte memory spaces. These eight locations are the first eight 4-Mbyte memory blocks starting with address 0x0000 0000, as shown in Figure 2. There is a user programmable register in the USIU to configure the internal memory map to one of the eight possible locations. Programmability of internal memory map location allows multiple chip system.

The IMB3 address space block in Figure 3 shows memory allocation for IMB3 modules. It does not show the actual memory space required for individual modules. All modules are mapped to the low address, numerically, of the memory allocated for that module in the IMB3 address space.



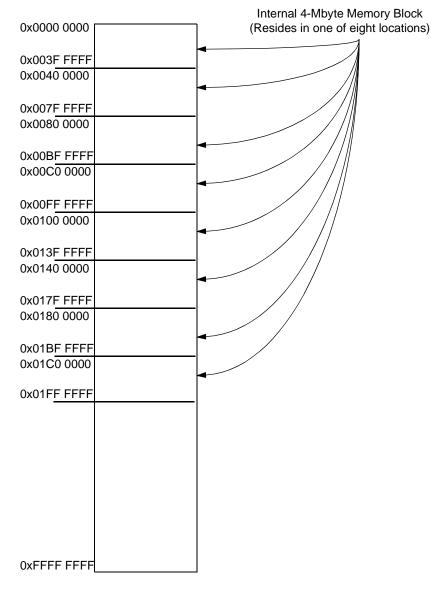


Figure 2. Memory Map

0x00 0000	UC3F_A Flash	
0x07 FFFF	512 Kbytes	
0x08 0000	UC3F_B Flash	
	512 Kbytes	
0x0F FFFF		
0x10 0000	Reserved for Flash	
0x2F 7FFF	(2,016 Kbytes)	
Ox2F 8000	DECRAM	Î
0x2F 8FFF	4 Kbytes	
0x2F 9000	Reserved	
0x2F 9FFF 0x2F A000		Ļ
	BBC Control Registers	1
0x2F BFFF	8 Kbytes	I
0x2F C000	USIU & Flash Control	1
0x2F FFFF	16 Kbytes	/
0x30 0000		
	UIMB I/F & IMB	
	Modules	
	32 Kbytes	
0x30 7FFF		
0x30 8000	Reserved for IMB	١
		١
0x37 FFFF	480 Kbytes	
0x38 0000	CALRAM/	
	Readi Control	
0x38 00FF	256 bytes	
0x38 0100	Reserved (L-bus Control)	
0x38 3FFF	~32 Kbytes	
0x38 4000		
0,00 +000		
	Reserved (L-bus Mem)	
	444 Kbytes	1
0x3F 6FFF		
0x3F 0FFF 0x3F 7000	All 4-Kbytes can be	ł
0.01 / 000	Overlay Section	
0x3F 7FFF	CALRAM_B (4 Kbyte)	
0x3F 8000		
	CALRAM_A (32 Kbyte)	
0x3F FFFF	CALRAM_A (32 Kbyte) 	

$\left  \right $	USIU Control Registers	0x2F C000
/	UC3F_A Control (64 bytes)	0x2F C800
	UC3F_B Control (64 bytes)	0x2F C840 0x2F C87F
	DPTRAM_AB Registers (64 bytes)	0x30 0000
/	DPTRAM_C Registers (64 bytes)	0x30 0040
	DLCMD2 (16 bytes)	0x30 0080
	Reserved (3952 bytes)	0x30 0090
	DPTRAM_C (4 Kbytes)	0x30 1000
	DPTRAM_AB (6 Kbytes)	0x30 2000
	Reserved (2 Kbytes)	0x30 3800
	TPU3_A (1 Kbytes)	0x30 4000
	TPU3_B (1 Kbytes)	0x30 4400
	QADC64_A (1 Kbytes)	0x30 4800
	QADC64_B (1 Kbytes)	0x30 4C00
	QSMCM_A (1 Kbytes)	0x30 5000
	QSMCM_B (1 Kbytes)	0x30 5400
	Reserved (1 Kbytes)	0x30 5800
	TPU3_C (1 Kbytes)	0x30 5C00
	MIOS14 (4 Kbytes)	0x30 6000
	TOUCAN_A (1 Kbytes)	0x30 7000
	TOUCAN_B (1 Kbytes)	0x30 7400
$\left  \right $	TOUCAN_C (1 Kbytes)	0x30 7800
	Reserved (896 bytes)	0x30 7900
	UIMB Control Registers (128 bytes)	0x30 7F80 0x30 7FFF
	· · · · · · · · · · · · · · · · · · ·	

Figure 3. Internal Memory Block	Figure	3.	Internal	Memory	Block
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## 5 MPC565 Pinout Diagram

Figure 4 shows the pinout for the MPC565.

21 22 23 3 4 Aurushi Aurusia Aurushi	III E. PUOR XS VOD E. PUOR	B_TPUCHI B_T2OLK	M18 MDA11 MDA13 27 MDA28 MDA29	LVWA-JW OVWA-JW	5 MP1032B11	C CNTX0 MPI032B13	VF0_ MPI032B0	VFLS0 MPI032B3	St	5	12_ 02	_ري ¥ور	- 6	1	Г							ы.	
21 22 23 24 3   4 Altwork 6., process 6., p	B_TPUCHB VSS B_1	B_TPUCHI		OWWA	~		_ I¶	MPIC	B PCS1 OGPIOT	B MOSI OGPIO5	B_TXD2_ CGPO2	A_SCK_ OGPIO6 (C3F_CLK)	A_PCS3_ OGPI03 (C3F_IOUT)	B_RXD1 QGP11	PULLSEL							OVDDL	26
21 22 23 1 4 J.Puchen 6. Puchen 6. 1 8 J.Puchen 6. J.Puchen 6. 1 8 J.Puchen 6. J.Puchen 6. 1 8 J.Puchen 10. J.Puchen 6. 1 9 J.Puchen 10. 2000 10. 1 1 J.Puchen 10. 1 1	B_TPUCH VSS		M18 27	2	MPWM16	MPWM21 MPI032B12	MPWM19	MPWMM MPI032B5	B_PCS0_SS BOGPIO0	B PCS3 J1850_TX	B_TXD1_ QGPO1	B_RXD2 J1850_RX	Achos-	A_RXD2_ OP12 (C3F_SUP2)	A_PCS1_ 0GPI01_	A_CNTXO	VSSF	RSTCONF- B_TEXP-	IRO7 B. MODCK3	IRO5_B_ SGPIOC5_ MODCK1_	OVDDL	VSS	25
21 22 4 A.Thuchi B.Thuchi B. B.Thuchi B.Thuchi B.	2		MPWM18 MDA27	MDA31	MPWM2	MDA14	MPI032B15	VF2_ MPI032B2	VFLS1 MPI032B4	B_MISO_ QGPIO4	B_PCS2_ 0GPI02_	A MISO OGPIO4	A_RXD1_ OP11 (C3F_SUP1)	A_TXD2_ 0GP02	VFLASH	EXTCLK	A_CNRXO	RO6 B MODCK2	SRESET_B	OVDDI.	NSS	QQA	24
21 4 A.TPUCH1 B.	E d	VDD	MPN032B5 MPI032B5 MDA12	MDA30	MPWM3	MDA15	C CNRX0 MPI032B14	VF1_ MPI032B1	HODH	B_ECK	B_SCK_ QGP106	A_TXD1_ QGPO1		A_PCS0_ SS_B / OGPI00_ (	NDDL	VDDF	PORESELE	HRESET_B	QVDDL	NSS	QQA	NC	23
<b>2 2</b>	LIPUCHIT			•	•			· · · · ·				~~.							VSS	QQA	NC	NGCLK_ BUCLK	22
ž ×	3_TPUCHA 8																		DDV	CLKOUT	BDIP_B	EPEE	21
20 A_TPUCHI	A_TPUCHIS E																		HOQN	BOEPEE	TS_B	TA_B	20
19 Д.ТРИСНИ /	A_TPUCH12 /																		BI_B_STS_B	TSI20	BURST_B	TSI21	19
18 LTPUCH6 A	A_TPUCH9 P				v														CS3_B	CS1_B	CS0_B	CS2_B	18
T7 LiPucets /	B_CNRX0 /				ball														NVDDL	-BWE_B_AT2	WE_B_AT0	WE_B_AT3	11
16 LTPUCH2 A	ETRIGI B VDDH				NOTE: This is a top down view of the balls.		SSV	VSS	VSS	VSS	VSS	VSS							WE_B_AT	CePoc2-R	OE_B	SGPIO B	16
15 QVDDL A	QVDDL QVDDL				iew o		NSS	vss	VSS	vss	VSS	VSS							NVDDL.	TEA_B IR	RD_WR_B	BR_B_VF1 _MP2	15
14 AN65_B_ POB1 AN66_B_ POB2	AN70_B PQB6 AN68_B PQB4				v n v		N SS	VSS	VSS	VSS	VSS	VSS							SGPICC7_ IROO UT_B_LMP0	04_B_AT2 SGP10C4	BB_B_ VF2_MP3	VBG_B VF0 BF	14
	ANTI_B_ A POB7 P				op do		NSS	VSS	vss	vss	VSS	VSS							NVDDL S	schoon 9	RERVE SGPIOC3	ROLE RSMB	13
8 5	AN75_B_ AI POA3 POA3 AN78_B_ MA				sato		SSV	VSS	VSS	vss	VSS	VSS							sGPIODzo	schlöbzi sd	schöm, R	SGPIOD18	12
	AN79_B AN POA7 PC AN59_A AN POA7 PC				his i		SSV	VSS	vss	vss	vss	vss							sGPIOD22 sd	scPiobza s	schömssc	DATA_SCPOI	۴
	AN57_A POA5 AN55_A AN55_A POA3				TE: T	l													schödza sc	s childres s	SCRIOD13 SC	SCPICOTA DA	10
	MA2POR PO				0 N														MUDL SG	schlötz6 sc	JA-scPon		6
8 MSPOn MSPOn Po	AN50_AL AN50_AL AN																		schöbzn		DATA_SCHUNTA_SCP	DATA_SGPIONTA_SGP	
۲ ۲	AJPOB2 ANY AJPOB2 PC AN82 AN4																		señobza se	schöbaa schöbaa	DATADA'	DATA_ SGPIOD8	7
6 7 ANBO POB4 POB4 ANB1 AN49 ANB1 POB5	ANB3 AM																		VDDH SC	s CPATA s C	DATAD SGPIOD5 SG	DATA_ D SCPIOD6 SG	6
5 ANBt ANB5	AN87 VDDH																		DQA	NC SG	DATA SGPIOD3 SI	DATAI SGPIOD4 SI	5
4 VRL 4LTREF	ABA LEOS	VSS	VDDSRAM3	TZCLK	FPUCH13	TRUCHA	MCKI	MSELB	MDO 5 MPI032B9	0_OdM	IMP1_ VFLS1	SGPIOC6_ FRZ_ PTR_B	WDDL.	sepono	sép08n2	sêPlokn4	S POR 30	OVDDL.	vss	DQV	DATAD	DATAD	4
	vdd vss	VDDSRAMI	C_TPUCHIS C_TPUCHI2 VDC	C_TPUCH8 C_	C_TPUCH3 C_T	с_трисно с_т	MDI_1	RSTLB N	MDO 68 MF	MCKO N	MDO_2 M	VFLS0 PI	ADDR_ SGPIOA8	ar_s&	séPlokn1 sél	sépona sé	sérioris sé	schlokan	CVDDL	vss	VDD	DATAC SGPIOD0 SC	3
	VDDSRAM2		C_TPUCH14 C_T	C_TPUCH7 C_T	C_TPUCH5 C_T	с_трисні с_т	TCK_DSCK	EVII_B F	MP032B10 MP	JCOMP N	rdo_dsdo	MSEO_B IW	SGROAT7 ADD SGP	SGPORT9 SGPIOA9	séP0%21 sél	sépokaa séf	séplokas séf	séplőker sél	NC	QVDDL	SSA	VDD DAT SGP	2
NO NO	VDDRTC VDDR		VSSRTC C_TF	с_трисня с_п	C_TPUCH6 C_TI	с_трисн2 с_т	MDL_0 TCK	TDL.DSD E	TMS MPD	MDO 7 MPI032B7	MDO_1 TDO.	MDO_3 MSR	séplőns séf	sépona séf	ser ser	séplőkaz séf	séplőkzai sél	séplőkas sép	SGPIOA28	sé Plokos	OVDDI	ASS V	-
× 8	C VD	E XTAL32	G CTP	H C-TH	J C_TF	K C_TF	L	M	z	P MPIG	R	T	u séPl	v s&PI	w SQB	Y sépi	aa sep	AB SGP	AC SGP	AD SGP	AE Q	AF	

Figure 4. MPC565 Pinout Diagram



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