Advance Information

MPC7447ANXPNS
Rev. 0, 2/2004

MPC7447A Part Number Specification for the MC7447AnnnnNx Series

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Motorola Part Numbers Affected:

MC7447AHX1000NB
MC7447AHX1167NB

This document describes part-number-specific changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the general *MPC7447A RISC Microprocessor Hardware Specifications*. The MPC7447A is a PowerPC™ microprocessor.

Specifications provided in this document supersede those in the *MPC7447A RISC Microprocessor Hardware Specifications*, Rev. 0 or later, for the part numbers listed in Table A only. Specifications not addressed herein are unchanged.

Note that headings and table numbers in this document are not consecutively numbered. They are intended to correspond to the heading or table affected in the general hardware specification.

Part numbers addressed in this document are listed in Table A.

Table A. Part Numbers Addressed by this Data Sheet

Motorola Part Number	Operating Conditions			Significant Differences from Hardware Specification
	CPU Frequency (MHz)	V_{DD}	T_j (°C)	
PPC7447AHX1000NB	1000	1.1 V ± 50 mV	0 to 105	Modified core frequency and voltage to reduce power consumption, modified processor bus clock frequency and AC timing.
PPC7447AHX1167NB	1167			

Note: The P prefix in a Motorola part number designates a “Pilot Production Prototype” as defined by Motorola SOP 3-13. These parts have only preliminary reliability and characterization data. Before pilot production prototypes may be shipped, written authorization from the customer must be on file in the applicable sales office acknowledging the qualification status and the fact that product changes may still occur while shipping pilot production prototypes.

1.2 Features

This section summarizes changes to the features of the MPC7447A described in the *MPC7447A RISC Microprocessor Hardware Specifications*.

- Power management
  - 1.1-V processor core

1.4 General Parameters

- Core power supply: 1.1 V ± 50 mV DC nominal

1.5.1 DC Electrical Characteristics

Table 4 provides the recommended operating conditions for the MPC7447A part numbers described herein.

Table 4. Recommended Operating Conditions [1]

Characteristic	Symbol	Recommended Value	Unit	Notes
Core supply voltage	V_{DD}	1.1 V ± 50 mV	V	
PLL supply voltage	AV_{DD}	1.1 V ± 50 mV	V	2

Note:
1. These are the recommended and tested operating conditions. Proper device operation outside of these conditions is not guaranteed.
2. This voltage is the input to the filter discussed in *MPC7447A RISC Microprocessor Hardware Specifications*, Section 1.9.2, “PLL Power Supply Filtering,” and not necessarily the voltage at the AV_{DD} pin, which may be reduced from V_{DD} by the filter.

Table 7 provides the power consumption for the MPC7447A part numbers described herein. For information regarding power consumption when dynamic frequency switching (DFS) is enabled, see the *MPC7447A RISC Microprocessor Hardware Specifications*.

Table 7. Power Consumption for MPC7447A

	Processor (CPU) Frequency		Unit	Notes
	1000 MHz	1167 MHz		
Full-Power Mode				
Typical	8.0	9.2	W	1, 2
Maximum	11.5	13.0	W	1, 3
Nap Mode				
Typical	1.3	1.3	W	1, 2
Sleep Mode				
Typical	1.3	1.3	W	1, 2
Deep Sleep Mode (PLL Disabled)				
Typical	1.2	1.2	W	1, 2

Notes:
1. These values apply for all valid processor buses. The values do not include I/O supply power (OV_{DD}) or PLL supply power (AV_{DD}). OV_{DD} power is system dependent but is typically < 5% of V_{DD} power. Worst case power consumption for AV_{DD} < 3 mW.
2. Typical power is an average value measured at the nominal recommended V_{DD} (see Table 4) and 65°C while running the Dhrystone 2.1 benchmark and achieving 2.3 Dhrystone MIPs/MHz.
3. Maximum power is the average measured at nominal V_{DD} and maximum operating junction temperature (see Table 4) while running an entirely cache-resident, contrived sequence of instructions which keep all the execution units maximally busy.
4. Doze mode is not a user-definable state; it is an intermediate state between full-power and either nap or sleep mode. As a result, power consumption for this mode is not tested.

1.5.2 AC Electrical Characteristics

Table 8 provides the clock AC timing specifications for the MPC7447A part numbers described herein.

Table 8. Clock AC Timing Specifications

At recommended operating conditions. See Table 4.

Characteristic	Symbol	Maximum Processor Core Frequency				Unit	Notes
		1000 MHz		1167 MHz			
		Min	Max	Min	Max		
Processor frequency	f_{core}	500	1000	500	1167	MHz	1, 2
VCO frequency	f_{VCO}	1000	2000	1000	2333	MHz	1

Notes:
1. **Caution**: The SYSCLK frequency and PLL_CFG[0:4] settings must be chosen such that the resulting SYSCLK (bus) frequency, CPU (core) frequency, and PLL (VCO) frequency do not exceed their respective maximum or minimum operating frequencies. Refer to the PLL_CFG[0:4] signal description in *MPC7447A RISC Microprocessor Hardware Specifications,* Section 1.9.1, “PLL Configuration,” for valid PLL_CFG[0:4] settings.
2. **Caution**: If dynamic frequency switching (DFS) is enabled, the SYSCLK frequency and PLL_CFG[0:4] settings must be chosen such that the resulting processor frequency is greater than or equal to the minimum core frequency.

1.5.2.2 Processor Bus AC Specifications

Devices described by this part number specification conform to the processor bus AC timing specifications provided in the *MPC7447A RISC Microprocessor Hardware Specifications*. Please refer to that document for this information.

1.11 Ordering Information

1.11.1 Part Numbers Addressed by This Specification

Table 16 provides the ordering information for the MPC7447A parts described in this document.

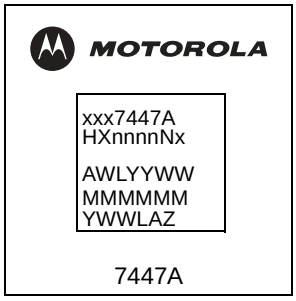
Table 16. Part Marking Nomenclature

xxx	**7447A**	**HX**	***nnnn***	**N**	***x***
Product Code	**Part Identifier**	**Package**	**Processor Frequency [1]**	**Application Modifier**	**Revision Level**
MC	7447A	HX = HCTE	1000 1167	N: 1.1 V ± 50 mV 0 to 105°C	B:1.1: PVR = 8003 0101

Notes:
1. Processor core frequencies supported by parts addressed by this specification only. Parts addressed by other specifications may support other maximum core frequencies.

1.11.3 Part Marking

Parts are marked as the example shown in Figure 22.



Notes:
AWYYYWW is the test code.
MMMMMM is the M00 (mask) number.
YWWWLAZ is the assembly traceability code.

Figure 22. Part Marking for BGA Device

Document Revision History

Table B provides a revision history for this part number specification.

Table B. Document Revision History

Rev. No.	Substantive Change(s)
0	Initial release.

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