

Advance Information

MPC7450RXQXPNS/D
Rev. 0, 11/2001

MPC7450 Part Number
Specification for the
XPC7450RXnnnQx Series



Motorola Part Numbers Affected:

XPC7450RX733QE
XPC7450RX800QE
XPC7450RX867QE

This document describes part-number-specific changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the general *MPC7450 RISC Microprocessor Hardware Specifications* (order # MPC7450EC/D).

Specifications provided in this document supersede those in the *MPC7450 RISC Microprocessor Hardware Specifications*, Rev. 4 or later, for the part numbers listed in Table A only. Specifications not addressed herein are unchanged. Because this document is frequently updated, refer to <http://www.motorola.com/semiconductors> or to your Motorola sales office for the latest version.

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) | |
| XPC7450RX733QE | 733 | 1.9 V ± 50 mV | 0 to 65 | Modified voltage and temperature specifications to achieve 733 MHz |
| XPC7450RX800QE | 800 | 1.9 V ± 50 mV | 0 to 65 | Modified voltage and temperature specifications to achieve 800 MHz |
| XPC7450RX867QE | 867 | 1.9 V ± 50 mV | 0 to 65 | Modified voltage and temperature specifications to achieve 867 MHz |

Note: The X prefix in a Motorola part number designates a “Pilot Production Prototype” as defined by Motorola SOP 3-13. These are from a limited production volume of prototypes manufactured, tested, and Q.A. inspected on a qualified technology to simulate normal production. 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.

Features

1.1 Features

This section summarizes changes to the features of the MPC7450 described in the *MPC7450 Hardware Specifications*.

- Power management
 - 1.9-V processor core

1.4 General Parameters

- Core power supply: 1.9 V \pm 50 mV DC nominal

1.5.1 DC Electrical Characteristics

Table 4 provides the recommended operating conditions for the MPC7450 part numbers described herein.

Table 4. Recommended Operating Conditions

| Characteristic | Symbol | Recommended Value | Unit |
|--------------------------|-----------|-------------------|------|
| Core supply voltage | V_{DD} | 1.9 V \pm 50 mV | V |
| PLL supply voltage | AV_{DD} | 1.9 V \pm 50 mV | V |
| Die-junction temperature | T_j | 0 to 65 | °C |

Note: These are the recommended and tested operating conditions. Proper device operation outside of these conditions is not guaranteed.

Table 7 provides the power consumption for the MPC7450 part numbers described herein.

Table 7. Power Consumption for MPC7450

| | Processor (CPU) Frequency | | | Unit | Notes |
|---------------------------------------|---------------------------|---------|---------|------|---------|
| | 733 MHz | 800 MHz | 867 MHz | | |
| Full-Power Mode | | | | | |
| Typical | 22.5 | 24.6 | 26.6 | W | 1, 3 |
| Maximum | 32.4 | 35.3 | 38.5 | W | 1, 2 |
| Doze Mode | | | | | |
| Typical | — | — | — | W | 1, 2, 4 |
| Nap Mode | | | | | |
| Typical | 2.3 | 2.5 | 2.7 | W | 1, 2 |
| Sleep Mode | | | | | |
| Typical | 1.2 | 1.3 | 1.4 | W | 1, 2 |
| Deep Sleep Mode (PLL Disabled) | | | | | |
| Typical | 790 | 860 | 930 | mW | 1, 3 |

Notes:

1. These values apply for all valid processor bus and L3 bus ratios. The values do not include I/O supply power (OV_{DD} and GV_{DD}) or PLL supply power (AV_{DD}). OV_{DD} and GV_{DD} power is system dependent, but is typically <20% of V_{DD} power. Worst case power consumption for $AV_{DD} < 3$ mW.
2. Maximum power is measured at nominal V_{DD} while running an entirely cache-resident, contrived sequence of instructions which keep the execution units, with or without AltiVec, maximally busy.
3. Typical power is an average value measured at nominal V_{DD} in a system while running a typical code sequence.
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.

1.11 Ordering Information

1.11.1 Part Numbers Addressed by this Specification

Table 20 provides the ordering information for the MPC7450 part described in this document.

Table 20. Part Marking Nomenclature

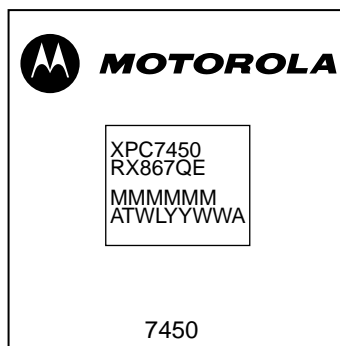
| XPC | 7450 | RX | nnn | x | x |
|---------------------|------------------------|----------------|--|-------------------------------|-------------------------|
| Product Code | Part Identifier | Package | Processor Frequency¹ | Application Modifier | Revision Level |
| XPC ² | 7450 | RX = CBGA | 733 800 867 | Q: 1.9 V ± 50 mV 0 to 65°C | E: 2.1; PVR = 8000 0201 |

Notes:

1. Processor core frequencies supported by parts addressed by this specification only. Parts addressed by other specifications may support other maximum core frequencies.
2. The X prefix in a Motorola part number designates a “Pilot Production Prototype” as defined by Motorola SOP 3-13. These are from a limited production volume of prototypes manufactured, tested, and Q.A. inspected on a qualified technology to simulate normal production. 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.

1.11.3 Part Marking

Parts are marked as the example shown in Figure 27.



Notes:

- MMMMMM is the 6-digit mask number.
- ATWLYYWWA is the traceability code.
- CCCCC is the country of assembly. This space is left blank if parts are assembled in the United States.

Figure 27. Motorola Part Marking for BGA Device

Ordering Information

HOW TO REACH US:

USA/EUROPE/LOCATIONS NOT LISTED:

Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217
1-303-675-2140 or 1-800-441-2447

JAPAN:

Motorola Japan Ltd.; SPS, Technical Information Center,
3-20-1, Minami-Azabu Minato-ku, Tokyo 106-8573 Japan
81-3-3440-3569

ASIA/PACIFIC:

Motorola Semiconductors H.K. Ltd.; Silicon Harbour
Centre, 2 Dai King Street, Tai Po Industrial Estate,
Tai Po, N.T., Hong Kong
852-26668334

TECHNICAL INFORMATION CENTER:

1-800-521-6274

HOME PAGE:

<http://www.motorola.com/semiconductors>

DOCUMENT COMMENTS:

FAX (512) 933-2625,
Attn: RISC Applications Engineering

Information in this document is provided solely to enable system and software implementers to use Motorola products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part.



Motorola and the Stylized M Logo are registered in the U.S. Patent and Trademark Office. digital dna is a trademark of Motorola, Inc. All other product or service names are the property of their respective owners. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

© Motorola, Inc. 2001

MPC7450RXQXPNS/D