

*Advance Information*

MPC7451RXSPNS/D  
Rev. 0, 4/2002

MPC7451 Part Number  
Specification for the  
XPC7451RXnnnSx Series

*Freescale Part  
Number Affected:  
XPC7451RX800SG*

This document describes part-number-specific changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the general *MPC7451 RISC Microprocessor Hardware Specifications* (Order No. MPC7451EC/D).

Specifications provided in this document supersede those in the *MPC7451 RISC Microprocessor Hardware Specifications*, Rev. 0.1 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.freescale.com/semiconductors> or to your Freescale 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.

The part number addressed in this document is listed in Table A. For more detailed ordering information see Section 1.11, "Ordering Information."

**Table A. Part Number Addressed by this Data Sheet**

Freescale Part Number	Operating Conditions			Significant Differences from Hardware Specification
	CPU Frequency	V <sub>DD</sub>	T <sub>J</sub> (°C)	
XPC7451RX800SG	800 MHz	1.75 ±50 mV	0 to 75	Modified voltage and temperature Specifications to achieve 800 MHz

**Note:** The X prefix in a Freescale part number designates a "Pilot Production Prototype" as defined by Freescale 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.

## 1.1 Features

This section summarizes changes to the features of the MPC7451 described in the *MPC7451 RISC Microprocessor Hardware Specifications*.

- Power management
  - 1.75-V processor core

## 1.4 General Parameters

This section summarizes changes to the general parameters of the MPC7451 described in the *MPC7451 RISC Microprocessor Hardware Specifications*.

- Core power supply: 1.75 V  $\pm$ 50 mV DC nominal

### 1.5.1 DC Electrical Characteristics

Table 4 provides the recommended operating conditions for the MPC7451 part numbers described herein.

**Table 4. Recommended Operating Conditions**

Characteristic	Symbol	Recommended Value	Unit
Core supply voltage	$V_{DD}$	1.75 V $\pm$ 50 mV	V
PLL supply voltage	$AV_{DD}$	1.75 V $\pm$ 50 mV	V
Die-junction temperature	$T_j$	0 to 75	$^{\circ}$ 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 MPC7451 part numbers described herein.

**Table 7. Power Consumption for MPC7451**

	Processor (CPU) Frequency	Unit	Notes
	800 MHz		
<b>Full-Power Mode</b>			
Typical	21.3	W	1, 3
Maximum	28.0	W	1, 2
<b>Doze Mode</b>			
Maximum	—	W	1, 2, 4
<b>Nap Mode</b>			
Maximum	2.5	W	1, 2
<b>Sleep Mode</b>			
Maximum	2.4	W	1, 2
<b>Deep Sleep Mode (PLL Disabled)</b>			
Typical	2.2	W	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 65°C and the nominal recommended  $V_{DD}$  (see Table 4) 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

## 1.5.2 AC Electrical Characteristics

The AC electrical characteristics and AC timing for all parts described herein are unaffected and comply with the *MPC7451 RISC Microprocessor Hardware Specifications*.

## 1.11 Ordering Information

### 1.11.1 Part Numbers Addressed by this Specification

Table 20 provides the ordering information for the MPC7451 part described in this document.

**Table 20. Part Marking Nomenclature Part Marking**

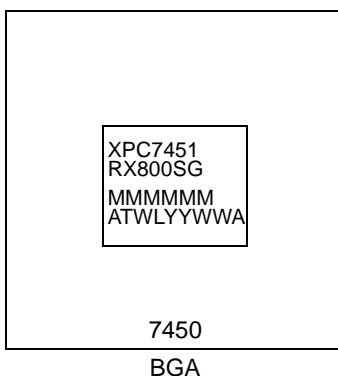
<b>XPC</b>	<b>7451</b>	<b>RX</b>	<b>nnn</b>	<b>x</b>	<b>x</b>
<b>Product Code</b>	<b>Part Identifier</b>	<b>Package</b>	<b>Processor Frequency<sup>1</sup></b>	<b>Application Modifier</b>	<b>Revision Level</b>
XPC <sup>2</sup>	7451	RX = CBGA	800	S: 1.75 V ±50 mV 0 to 75°C	G: 2.3; PVR = 8000 0203

**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 Freescale part number designates a "Pilot Production Prototype" as defined by Freescale 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. Freescale 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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