Freescale Semiconductor
Advance Information

MPC755 RISC Microprocessor Hardware Specifications Addendum for the XPC755*xxxnnn*LE Series

This document describes part-number-specific changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the general *MPC755 RISC Microprocessor Hardware Specifications* (MPC755EC). The MPC755 and MPC745 are reduced instruction set computing (RISC) microprocessors that implement the PowerPC™ instruction set architecture. The devices described in this specification are no longer in production and this document is provided for reference only. For recommended upgrades or replacement devices, contact your Freescale sales office.

Specifications provided in this document supersede those in the *MPC755 RISC Microprocessor Hardware Specifications*, Rev. 6 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.

Freescale Part Numbers Affected:

> *XPC755BRX400LE*
> *XPC755BPX400LE*
> *XPC755CRX450LE*

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Part numbers addressed in this document are listed in Table A. For more detailed ordering information, see Section 10, "Ordering Information."

Table A. Part Numbers Addressed by This Data Sheet

Freescale Part Number	Operating Conditions			Significant Differences from Hardware Specification
	CPU Frequency (MHz)	V_{DD}	T_J (°C)	
XPC755BRX400LE	400	2.0 V ±100 mV	0 to 105	Modified power specifications. These devices are no longer in production.
XPC755BPX400LE				
XPC755CRX450LE	450			

Note: The X prefix in a Freescale PowerPC 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.

4.1 DC Electrical Characteristics

Table 3. Recommended Operating Conditions [1]

Characteristic	Symbol	Recommended Value		Unit	Notes
		400 MHz, 450 MHz			
		Min	Max		
Core supply voltage	V_{DD}	1.90	2.10	V	2
PLL supply voltage	AV_{DD}	1.90	2.10	V	2
L2 DLL supply voltage	$L2AV_{DD}$	1.90	2.10	V	2

Notes:
1. These are the recommended and tested operating conditions. Proper device operation outside of these conditions is not guaranteed.
2. 2.0 V nominal.

Table 7. Power Consumption for MPC755

	Processor (CPU) Frequency		Unit	Notes
	400 MHz	**450 MHz**		
Full-Power Mode				
Typical	4.0	4.6	W	1, 3, 4
Maximum	6.0	8.0	W	1, 2
Doze Mode				
Maximum	2.3	2.8	W	1, 2, 4
Nap Mode				
Maximum	1.0	1.0	W	1, 2, 4
Sleep Mode				
Maximum	470	470	mW	1, 2, 4
Sleep Mode (PLL and DLL Disabled)				
Maximum	430	430	mW	1, 2

Notes:

1. These values apply for all valid processor bus and L2 bus ratios. The values do not include I/O supply power (OV_{DD} and $L2OV_{DD}$) or PLL/DLL supply power (AV_{DD} and $L2AV_{DD}$). OV_{DD} and $L2OV_{DD}$ power is system dependent, but is typically <10% of V_{DD} power. Worst case power consumption for AV_{DD} = 15 mW and $L2AV_{DD}$ = 15 mW.
2. Maximum power is measured at nominal V_{DD} (see Table 3) while running an entirely cache-resident, contrived sequence of instructions which keep the execution units maximally busy.
3. Typical power is an average value measured at the nominal recommended V_{DD} (see Table 3) and 65°C in a system while running a typical code sequence.
4. Not 100% tested. Characterized and periodically sampled.

4.2.1 Clock AC Specifications

Table 8. Clock AC Timing Specifications

At recommended operating conditions (see Table 3)

Characteristic	Symbol	Maximum Processor Core Frequency				Unit	Notes
		400 MHz		**450 MHz**			
		Min	**Max**	**Min**	**Max**		
Processor frequency	f_{core}	200	400	200	450	MHz	1
VCO frequency	f_{VCO}	400	800	400	900	MHz	1

Note:

1. **Caution:** The SYSCLK frequency and PLL_CFG[0:3] 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[0:3] signal description in Section 1.8.1, "PLL Configuration," for valid PLL_CFG[0:3] settings.

MPC755 RISC Microprocessor Hardware Specifications Addendum for the XPC755xxxnnnLE Series, Rev. 0.1

10   Ordering Information

10.1   Part Numbers Addressed by This Specification

Table 20 provides the ordering information for the MPC755 parts described in this specification.

Table 20. Part Numbering Nomenclature

XPC   755   x   xx   nnn   x   x

Product Code	Part Identifier	Process Descriptor	Package	Processor Frequency	Application Modifier	Revision Level
XPC [1]	755	B = HiP4DP	RX = CBGA	400	L: 2.0 V ±100 mV 0° to 105°C	E: 2.8; PVR = 0008 3203
			PX = PBGA			
	755	C = HiP4DP	RX = CBGA	450		

Notes:

1. 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.

10.3   Part Marking

Parts are marked as the example shown in Figure 29.


```
          MPC755B
          RX400LE
          MMMMMM
          ATWLYYWWA

               755
```

BGA
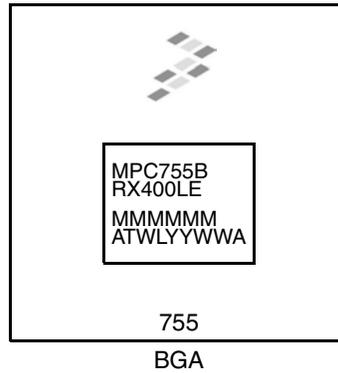
Notes:

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 29. Part Marking for BGA Device

Document Revision History

Table B provides a revision history for this hardware specifications addendum.

Table B. Document Revision History

Rev. No.	Date	Editor/ Writer	Substantive Change(s)
0.1	02/15/2006	BM/NB	Changed document order number (was MPC755XLEPNS, Rev. 0). Updated to Freescale template. Updated section numbers to match the hardware specifications document.
0			Initial release.

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