

# MPC8641 and MPC8641D Integrated Host Processor Hardware Specifications Addendum for the MC8641xTxxnnnnxC Series

This document describes part-number-specific changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the general *MPC8641 and MPC8641D Integrated Host Processor Hardware Specifications* (Document No. MPC8641DEC).

Specifications provided in this document supersede those in the *MPC8641 and MPC8641D Integrated Host Processor Hardware Specifications*, Rev. 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 the website listed on the back page of this document or contact 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.

*Freescale Part Numbers Affected:*

MC8641DTHX1333JC  
MC8641DTHX1250HC  
MC8641DTHX1000NC  
MC8641DTHX1000GC  
MC8641THX1333JC  
MC8641THX1250HC  
MC8641THX1000NC  
MC8641THX1000GC  
MC8641DTVU1333JC  
MC8641DTVU1250HC  
MC8641DTVU1000NC  
MC8641DTVU1000GC  
MC8641TVU1333JC  
MC8641TVU1250HC  
MC8641TVU1000NC  
MC8641TVU1000GC

Part numbers addressed in this document are listed in [Table A](#).

**Table A. Part Numbers Addressed by This Data Sheet**

Freescale Part Number	Operating Conditions			Significant Differences from Hardware Specification
	CPU Frequency (MHz)	V <sub>DD-Core</sub>	T <sub>j</sub> (°C)	
MC8641DTHX1333JC	1333	1.05 V ± 50 mV	-40 to 105	Modified JTAG AC timing; extended junction temperature range.
MC8641DTHX1250HC	1250	1.05 V ± 50 mV		
MC8641DTHX1000NC	1000	0.95 V ± 50 mV		
MC8641DTHX1000GC	1000	1.05 V ± 50 mV		
MC8641THX1333JC	1333	1.05 V ± 50 mV		
MC8641THX1250HC	1250	1.05 V ± 50 mV		
MC8641THX1000NC	1000	0.95 V ± 50 mV		
MC8641THX1000GC	1000	1.05 V ± 50 mV		
MC8641DTVU1333JC	1333	1.05 V ± 50 mV		
MC8641DTVU1250HC	1250	1.05 V ± 50 mV		
MC8641DTVU1000NC	1000	0.95 V ± 50 mV		
MC8641DTVU1000GC	1000	1.05 V ± 50 mV		
MC8641TVU1333JC	1333	1.05 V ± 50 mV		
MC8641TVU1250HC	1250	1.05 V ± 50 mV		
MC8641TVU1000NC	1000	0.95 V ± 50 mV		
MC8641TVU1000GC	1000	1.05 V ± 50 mV		

## 2 General Parameters

This section summarizes changes to the general parameters of the MPC8641 described in the *MPC8641 and MPC8641D Integrated Host Processor Hardware Specifications*.

- Modified JTAG AC timing
  - t<sub>JTDVKH</sub> (min) = 15 ns
- Extended junction temperature range
  - T<sub>J</sub> = -40 to 105 °C

## 2.1 Overall DC Electrical Characteristics

### 2.1.2 Recommended Operating Conditions

Table 2 provides the recommended operating conditions for the MPC8641 part numbers described herein.

Table 2. Recommended Operating Conditions

Characteristic	Symbol	Recommended Value	Unit	Notes
Junction temperature range	$T_J$	-40 to 105	°C	—

## 11.2 JTAG AC Electrical Specifications

Table 44 provides the JTAG AC timing specifications for the MPC8641 part numbers described herein.

Table 44. JTAG AC Timing Specifications (Independent of SYSClk) <sup>1</sup>

Parameter	Symbol <sup>2</sup>	Min	Max	Unit	Notes
Input setup times:				ns	
Boundary-scan data TMS, TDI	$t_{JTDVKH}$ $t_{JTIVKH}$	15 0	— —		4

**Notes:**

- All outputs are measured from the midpoint voltage of the falling/rising edge of  $t_{TCLK}$  to the midpoint of the signal in question. The output timings are measured at the pins. All output timings assume a purely resistive 50- $\Omega$  load (see Figure 32). Time-of-flight delays must be added for trace lengths, vias, and connectors in the system.
- The symbols used for timing specifications herein follow the pattern of  $t_{(first\ two\ letters\ of\ functional\ block)(signal)(state)(reference)(state)}$  for inputs and  $t_{(first\ two\ letters\ of\ functional\ block)(reference)(state)(signal)(state)}$  for outputs. For example,  $t_{JTDVKH}$  symbolizes JTAG device timing (JT) with respect to the time data input signals (D) reaching the valid state (V) relative to the  $t_{JTG}$  clock reference (K) going to the high (H) state or setup time. Also,  $t_{JTDXKH}$  symbolizes JTAG timing (JT) with respect to the time data input signals (D) went invalid (X) relative to the  $t_{JTG}$  clock reference (K) going to the high (H) state. Note that, in general, the clock reference symbol representation is based on three letters representing the clock of a particular functional. For rise and fall times, the latter convention is used with the appropriate letter: R (rise) or F (fall).
- Non-JTAG signal input timing with respect to  $t_{TCLK}$ .

## 21 Ordering Information

### 21.1 Part Numbers Fully Addressed by This Document

Table 74 provides the ordering information for the MPC8641 parts described in this document.

Table 74. Part Numbering Nomenclature

MC	nnnn	x	w	xx	nnnn	x	x
Product Code	Part Identifier	Core Count	Temp	Package <sup>1</sup>	Core Processor Frequency <sup>2</sup> (MHz)	DDR speed (MHz)	Product Revision Level
MC	8641	Blank = Single Core D = Dual Core	T = -40 to 105 °C	HX = High-lead HCTE FC-CBGA VU = RoHS lead-free HCTE FC-CBGA	1000, 1250, 1333	N = 500 MHz <sup>4</sup> J = 533 MHz H = 500 MHz G = 400 MHz	Revision C = 2.1 System Version Register Value for Rev C: 0x8090_0021 - MPC8641 0x8090_0121 - MPC8641D

**Notes:**

1. See Section 16, "Package," for more information on available package types.
2. Processor core frequencies supported by parts addressed by this specification only. Not all parts described in this specification support all core frequencies. Additionally, parts addressed by part number specifications may support other maximum core frequencies.
3. The P prefix in a Freescale part number designates a "Pilot Production Prototype" as defined by Freescale 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.
4. Part Number MC8641xwxx1000NX is our low  $V_{DD\_Coren}$  device.  $V_{DD\_Coren} = 0.95\text{ V}$  and  $V_{DD\_PLAT} = 1.05\text{ V}$ .

## Document Revision History

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

Table B. Document Revision History

Rev. Number	Date	Substantive Change(s)
0	12/2008	Initial release.

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