

MPC7410 RISC Microprocessor Hardware Specifications Addendum for the MPC7410TxxnnnNE Series

This document describes part-number-specific changes to the *MPC7410 RISC Microprocessor Hardware Specifications* (Document No. MPC7410EC).

Specifications provided in this document supersede those in the *MPC7410 RISC Microprocessor Hardware Specifications*, Rev. 6.1 or later, for the part numbers listed in [Table A](#). only. Specifications not addressed herein are unchanged.

Because this document is frequently updated, see the website listed on the back page of this document or contact your Freescale sales office for the latest version.

Freescale Part Numbers Affected:

MPC7410TRX400NE

MPC7410TRX450NE

MPC7410THX450NE

Table A. Part-Number-Specific Changes

Freescale Part Number	Operating Conditions				Significant Differences from Hardware Specification
	CPU Frequency	Vdd	T _J (°C)	OVdd	
MPC7410TRX400NE	400 MHz	1.5V±50mV	-40 to 105	1.8/2.5 V	Extended temperature range. Reduced core voltage to achieve lower power consumption. Removes 3.3 V OVdd support. For all AC/DC specifications not mentioned in this document, see the MPC7410RX400LE specifications in the general <i>MPC7410 Hardware Specifications</i> .
	450 MHz	1.8V±100mV	-40 to 105	1.8/2.5/3.3 V	Extended temperature range. The MPC7410TRX400NE also fully conforms to the MPC7410TRX450LE specification. See the general <i>MPC7410 Hardware Specifications</i> .
MPC7410TRX450NE	450 MHz	1.5V±50mV	-40 to 105	1.8/2.5 V	Extended temperature range. Reduced core voltage to achieve lower power consumption. Removes 3.3V OVdd support. For all AC/DC specifications not mentioned in this document, please refer to the MPC7410RX450LE specifications in the general <i>MPC7410 Hardware Specifications</i> .
	500 MHz	1.8V±100mV	-40 to 105	1.8/2.5/3.3 V	Extended temperature range. The MPC7410TRX450NE also fully conforms to the MPC7410TRX500LE specification. See the general <i>MPC7410 Hardware Specifications</i> .
MPC7410THX450NE	450 MHz	1.5V±50mV	-40 to 105	1.8/2.5 V	Extended temperature range. Reduced core voltage to achieve lower power consumption. Removes 3.3V OVdd support. For all AC/DC specifications not mentioned in this document, see to the MPC7410HX450LE specifications in the general <i>MPC7410 Hardware Specifications</i> .
	500 MHz	1.8V±100mV	-40 to 105	1.8/2.5/3.3 V	Extended temperature range. The MPC7410THX450NE also fully conforms to the MPC7410THX500LE specification. See the general <i>MPC7410 Hardware Specifications</i> .

Features

The MPC7410TxxnnnNE feature set is identical to that of the MPC7410, with the following exceptions:

- Bus interface
 - Selectable interface voltages of 1.8 V, 2.5 V (3.3 V is not supported)

DC Electrical Characteristics

The MPC7410TxxnnnNE DC electrical characteristics are identical to that of the MPC7410, with the exceptions shown in [Table B](#), [Table C](#), and [Table D](#).

Voltage to the L2 I/Os and processor interface I/Os are provided through separate sets of supply pins and may be provided at the voltages shown in [Table B](#).

Table B. Input Threshold Voltage Setting

BVSEL Signal ³	Processor Bus Input Threshold is Relative to:	L2VSEL Signal ³	L2 Bus Input Threshold is Relative to:	Note
0	1.8 V	0	1.8 V	1
$\overline{\text{HRESET}}$	2.5 V	$\overline{\text{HRESET}}$	2.5 V	1, 2
1	Not Supported	1	2.5 V	1, 4, 5
HRESET	Not Supported	HRESET	Not Supported	—

Notes:

- Caution:** The input threshold selection must agree with the OVdd/L2OVdd voltages supplied.
- To select the 2.5-V threshold option, BVSEL and/or L2VSEL should be tied to $\overline{\text{HRESET}}$ so that the two signals change state together. This is the preferred method for selecting this mode of operation.
- To overcome the internal pull-up resistance, a pull-down resistance less than 250 ohms should be used.
- Default voltage setting if left unconnected (internal pulled-up).
- Caution:** The MPC7410TRXnnnNE does not support the default OVdd setting of 3.3 V. The BVSEL input must be tie either low or to $\overline{\text{HRESET}}$.

Table C. Recommended Operating Conditions

Characteristic	Symbol	Recommended Value	Unit	
Core supply voltage	V _{dd}	1.5V ± 50mV	V	
PLL supply voltage	AV _{dd}	1.5V ± 50mV	V	
L2 DLL supply voltage	L2AV _{dd}	1.5V ± 50mV	V	
Processor bus supply voltage	BVSEL = 0	OV _{dd}	1.8V ± 100mV	V
	BVSEL = $\overline{\text{HRESET}}$	OV _{dd}	2.5V ± 100mV	V
	BVSEL = HRESET or BVSEL = 1	OV _{dd}	Not Supported	V
L2 bus supply voltage	L2VSEL = 0	L2OV _{dd}	1.8V ± 100mV	V
	L2VSEL = $\overline{\text{HRESET}}$ or L2VSEL = 1	L2OV _{dd}	2.5V ± 100mV	V
Input voltage	Processor bus and JTAG Signals	V _{in}	GND to OV _{dd}	V
	L2 Bus	V _{in}	GND to L2OV _{dd}	V
Die-junction temperature	T _j	-40 to 105	°C	

Table D. Power Consumption for MPC7410

	Processor (CPU) Frequency	Processor (CPU) Frequency	Unit	Notes
	400 MHz	450 MHz		
Full-On Mode				
Typical	2.92	3.29	W	1, 3
Maximum	6.6	7.43	W	1, 2,
Doze Mode				
Maximum	3.6	4.1	W	1, 2
Nap Mode				
Maximum	1.35	1.5	W	1, 2
Sleep Mode				
Maximum	1.3	1.45	W	1, 2
Sleep Mode—PLL and DLL Disabled				
Typical	0.6	0.6	W	1, 3
Maximum	1.1	1.1	W	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 (OVdd and L2OVdd) or PLL/DLL supply power (AVdd and L2AVdd). OVdd and L2OVdd power is system dependent, but is typically <10% of Vdd power. Worst case power consumption for AVdd = 15 mw and L2AVdd = 15 mW.
2. Maximum power is measured at 105 °C and Vdd = 1.5V while running an entirely cache-resident, contrived sequence of instructions which keep the execution units, including AltiVec, maximally busy.
3. Typical power is an average value measured at 65 °C and Vdd = 1.5V in a system while running typical benchmarks.

Part Numbers Addressed by this Specification

Table E provides the ordering information for the MPC7410TxxnnnNE series.

Table E. Part Marking Nomenclature

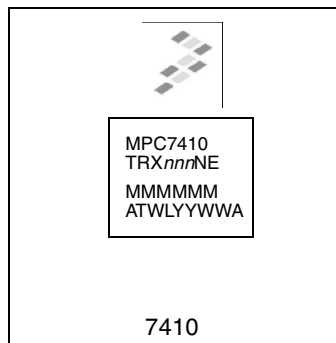
MPC	7410	x	xx	nnn	x	x
Product Code	Part Identifier	Process Descriptor	Package	Processor Frequency ¹	Application Modifier	Revision Level
MPC	7410	T: -40° to 105°C	RX = CBGA	400 450	N: 1.5 V ±50 mV	E: 1.4; PVR = 800C 1104
			HX = HCTE_CBGA	450		

Note:

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

Part Marking

Parts are marked as the example shown in [Figure A](#).



Notes:

- nnn* is the speed grade of the part
- 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)

BGA

Figure A. Freescale Part Marking for BGA Device

Document Revision History

[Table F](#) provides a revision history for this document.

Table F. Document Revision History

Rev. Number	Date	Substantive Changes
2	11/2010	<ul style="list-style-type: none"> • Removed “RX” from document title. • Added MPC7410THX450NE to list of devices covered by this document. • In Table B, “Input Threshold Voltage Setting,” changed “XPC7410TRXnnnNE” to “MPC7410TRXnnnNE” in note 5. • Updated Table E, “Part Marking Nomenclature,” to include MPC7410THX450NE.
1.2	4/2005	<ul style="list-style-type: none"> • Document template update • Document ID change from MPC7410TRXNEPNS/D for Part Number Specification to MPC7410ECS07AD for Hardware Specification Addendum.
1.1	5/2003	Rather than readers of this spec referring to the MPC7410RXnnnNE part number spec and then to the MPC7410RXnnnLE general hardware spec, this spec now includes the spec differences outlined in the MPC7410RXnnnNE part number spec. Any specifications not called out in this spec for the part numbers listed in Table A default back to the general hardware spec.
1	—	Minor formatting
0	—	Initial Release

How to Reach Us:

Home Page:

www.freescale.com

Web Support:

<http://www.freescale.com/support>

USA/Europe or Locations Not Listed:

Freescale Semiconductor, Inc.
 Technical Information Center, EL516
 2100 East Elliot Road
 Tempe, Arizona 85284
 1-800-521-6274 or
 +1-480-768-2130
www.freescale.com/support

Europe, Middle East, and Africa:

Freescale Halbleiter Deutschland GmbH
 Technical Information Center
 Schatzbogen 7
 81829 Muenchen, Germany
 +44 1296 380 456 (English)
 +46 8 52200080 (English)
 +49 89 92103 559 (German)
 +33 1 69 35 48 48 (French)
www.freescale.com/support

Japan:

Freescale Semiconductor Japan Ltd.
 Headquarters
 ARCO Tower 15F
 1-8-1, Shimo-Meguro, Meguro-ku
 Tokyo 153-0064
 Japan
 0120 191014 or
 +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:

Freescale Semiconductor China Ltd.
 Exchange Building 23F
 No. 118 Jianguo Road
 Chaoyang District
 Beijing 100022
 China
 +86 10 5879 8000
support.asia@freescale.com

For Literature Requests Only:

Freescale Semiconductor
 Literature Distribution Center
 1-800 441-2447 or
 +1-303-675-2140
 Fax: +1-303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor 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.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor 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 Freescale Semiconductor 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. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor 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 Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor 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 Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale, the Freescale logo, and PowerQUICC are trademarks of Freescale Semiconductor, Inc. Reg. U.S. Pat. & Tm. Off. CoreNet, QorIQ, QUICC Engine, and VortiQa are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. The Power Architecture and Power.org word marks and the Power and Power.org logos and related marks are trademarks and service marks licensed by Power.org.

© 2010 Freescale Semiconductor, Inc.

Document Number: MPC7410ECS07AD

Rev. 2

11/2010



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Microprocessors - MPU category](#):

Click to view products by [NXP manufacturer](#):

Other Similar products are found below :

[MC7457RX1000LC](#) [MC7457RX1267LC](#) [A2C00010998 A](#) [A2C52004004](#) [R5F117BCGNA#20](#) [ADJ3400IAA5DOE](#) [MPC8245TZU300D](#)
[MPC8260ACVVMHBB](#) [MPC8323ECVRAFDCA](#) [MPC8536ECVJAVLA](#) [BOXNUC5PGYH0AJ](#) [20-668-0024](#) [P1010NSN5DFB](#)
[P2020NXE2HHC](#) [P5020NSE7VNB](#) [LS1020ASN7KQB](#) [LS1020AXN7HNB](#) [LS1020AXN7KQB](#) [A2C00010729 A](#) [A2C00039344](#)
[T1022NSE7MQB](#) [T1022NXN7PQB](#) [T1023NSE7MQA](#) [T1024NXE7PQA](#) [T1042NSN7MQB](#) [T1042NXN7WQB](#) [T2080NSN8PTB](#)
[T2080NXE8TTB](#) [T2081NXN8TTB](#) [MC68302CEH20C](#) [TS68040MF33A](#) [MPC8260ACVVMIBB](#) [MPC8280CZUUPEA](#)
[MPC8313ECVRAGDC](#) [MPC8313EVRADDC](#) [MPC8313VRADDC](#) [MPC8323EVRAFDCA](#) [BOXSTCK1A8LFCL](#) [UPD78F0503AMCA-](#)
[CAB-G](#) [UPD78F0513AGA-8EU-AT](#) [Z8018008VEG](#) [LS1020ASE7HNB](#) [LS1021ASE7KQB](#) [LS1021ASN7KQB](#) [MPC8358ECVRAGDGA](#)
[MPC8544CVJALFA](#) [MPC855TZQ80D4](#) [MPC8569VJAUNLB](#) [P1013NSN2EFB](#) [P5020NXE7TNB](#)