



# PXA270M Migration

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CCBU Applications Engineering

*Migrating your design from PXA270 to PXA270M*



# Level Set

- PXA270 was manufactured at Intel Fabs
- PXA270M is manufactured at TSMC Fabs
  - Marvell engineers migrated the RTL database
- During the migration, Marvell fixed some of the errata from the PXA270
  - Errata fixes are documented in the Spec Update
  - No other changes were made
- However, due to process changes **both parts may operate differently;**
  - I/O buffers and pullup and pulldown resistors
- A Specification Clarification was added to the Spec Update document to highlight potential differences
- **PXA270 and PXA270M are not drop in replacements**
- Some changes may be needed for HW and SW components to operate

# PXA270M Migration Failures

- A number of migration issues have been escalated and debugged
  - Many of these issues have been caused by HW specifications and SW initialization not being followed correctly
  
- In the event of PXA270M migration failures, follow the basic steps of identifying root cause:
  - Check the power-on sequencing
  - Check the voltage levels for the power domains
    - VCC\_CORE typical voltage has been changed – Errata #59
  - Be prepared to re-calibrate drive strength settings for SDRAM and LCD
  - Internal resistors are different; this could affect pin load or external devices
  - Ensure correct SW configuration for the unit in question
  
- Just because PXA270 has passed a customer production qual does not mean that all the specifications were followed correctly
  - Some migration issues were root caused to not following spec but PXA270 still worked!
  - PXA270M is different and may not perform the same, while out of spec!

# PXA270M and PXA270 Spec Update Differences

- ▶ Both PXA270 and PXA270M have separate Spec Updates!
  - PXA270
    - Errata #60 describes “Voltage Sensitivity” problem
    - The workaround is to raise certain VCC\_CORE operating voltages
    - This is an errata with “No Fix” status = customers should use workaround to avoid errata
  - PXA270M
    - Errata #59 (Same as PXA270 #60) describes “Voltage Sensitivity” problem
    - Use the raised VCC\_CORE voltages in the workaround as the new Specification
    - This is an errata with “Fixed” status = customers MUST use these voltages
    - Voltage Ssensitivity issue does not exist on PXA270M because the spec has changed!
  
- ▶ Both PXA270 and PXA270M share the same EMTS!
  - The documented VCC\_CORE voltage specifications are the “New Specs” for PXA270M
    - PXA270 designs are recommended to follow the “workaround”
    - PXA270M designs must follow the “specification”

# PXA270M Voltage Spec As Updated in EMTS Rev D April '09

- **VCC\_CORE Vmin Spec (EMTS)**

- VVCCC1: Core Voltage and Frequency Range 1 (13/13/13/13 CCCR[CPDIS]=1, CCCR[PPDIS]=1)
  - Typical: 1.0V
  - Min: 0.95V
- VVCCC2: Core Voltage and Frequency Range 2 (13/13/13/13 CCCR[CPDIS]=1, CCCR[PPDIS]=0), (91/45.5/91/45.5), and (104/104/104/104)
  - Typical: 1.0V
  - Min: 0.95V
- Deep-Idle:
  - Max: 1.705V
  - Typical: 1.0V
  - Min: 0.95V

- **VCC\_BAT Vmin Spec (EMTS)**

- VVCC0:
  - Min: 2.4V

- These voltage specifications eliminate Errata #59 for PXA270M and are required in the PXA270M



# Clarifying The Voltage Specifications 1 of 2

- EMTS (Table 5-11): Core Voltage and Frequency Electrical Spec

Symbol	Description	Min	Typical	Max	Units
Core Voltage and Frequency Range 1 (13/13/13/13 CCCR[CPDIS]=1, CCCR[PPDIS]=1)					
VVCCC1	Voltage applied on VCC_CORE	<b>270M=0.95</b> <b>270=0.8075)</b>	<b>270M=1.0</b> <b>270=0.9</b>	1.705	V
fCORE1	Core operating frequency	13	---	13	MHz
Tpwram	Ramp Rate	---	10	12	mV/uS
Core Voltage and Frequency Range 2 (13/13/13/13 CCCR[CPDIS]=1, CCCR[PPDIS]=0), (91/45.5/91/45.5), and (104/104/104/104)					
VVCCC2	Voltage applied on VCC_CORE	<b>270M=0.95</b> <b>270=0.855</b>	<b>270M=1.0</b> <b>270=0.9</b>	1.705	V
fCORE12	Core operating frequency	91	---	104	MHz
Tpwram	Ramp Rate	---	10	12	mV/uS

- EMTS (Table 5-13): Core Voltage Specifications For Low Power Modes

Mode	Description	Min	Typical	Max	Units
Standby	Voltage applied on VCC_CORE	1.045	1.1	1.21	V
Deep-Idle	Voltage applied on VCC_CORE	<b>270M=0.95</b> <b>270=0.8075</b>	<b>270M=1.0</b> <b>270=0.85</b>	<b>270M=1.705</b> <b>270=0.935</b>	V



# Clarifying The Voltage Specifications 2 of 2

- EMTS (Table 5-9): Voltage, Temperature, and Frequency Electrical Spec

Symbol	Description	Min	Typical	Max	Units
VCC_BATT Voltage					
VVCC0	Voltage applied on VCC_BATT @3.0V	<b>270M=2.40</b> <b>270=2.25</b>	3.00	3.75	V
VVDF1	Voltage difference between VCC_BATT and VCC_IO during power-on reset or deep-sleep wake-up (from the assertion of SYS_EN to the de-assertion of nRESET_OUT)	0	-	0.30	V
VVDF2	Voltage difference between VCC_BATT and VCC_IO when VCC_IO is enabled	0	-	0.20	V
Tbramp	Ramp Rate	-	10	12	mV/uS

- 270M = PXA270M Voltage Specification**
- 270 = PXA270 Specification (with errata #60 against this spec)**

## Marvell – Next Steps

- ▶ Continue Engineering support to Customers and Field
  - Drive a hard line of due diligence for checking basics before escalation
- ▶ Provide Customer base with updated PXA270M IBIS Models
  - Both PXA270 and PXA270M have different IBIS models – Available NOW!
- ▶ Publish updated Spec Updates for both PXA270M and PXA270
- ▶ PXA270 Spec Update Changes – Release Version B (May 2010)
  - Updated Errata #60 – Points Reader to S1
  - Added Errata #95 – new errata
  - Added Specification Clarification S1 – Clarifies operating specifications & Errata #60
- ▶ PXA270M Spec Update Changes – Release Rev J (May 2010)
  - Updated Errata #59 – points reader to S17
  - Updated Added Specification Clarification S1 – highlights new PXA270M IBIS model
  - Added Specification Change S17 – Some operating voltages were changed to avoid errata #59 ; however, the EMTS update deleted PXA270 specifications



## Questions/Support

- ▶ Please continue to log your issues to your local FAE/escalation through:
  - support.marvell.com
  
- ▶ Documentation is still available at:
  - The extranet located under; [MY PRODUCTS](#) > [CELLULAR & HANDHELD SOLUTIONS](#) > [APPLICATIONS PROCESSORS](#) > [PXA27X](#)
    - Will add a note with new location on marvell.com site for docs when ready
  - The external site is;
    - <http://www.marvell.com/products/processors/applications/>
    - Look for PXA27x documents and software