Application Report
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TMS320DM365/DM368 Migration Guide

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ABSTRACT

This application report describes the changes necessary to migrate a DM365-based design from a DM365 device (216 MHz or 270 MHz or 300 MHz) to a DM368 (432 MHz) device. The DM368 device provides increased performance as compared to the DM365 device.

The changes listed in this document are required by the DM368 device for proper operation. Other system changes may be required to accommodate new speeds or capabilities in the system.

Additional information on these two devices is available on the TI website located in the respective product folders at the following web pages.

TMS320DM365 - http://focus.ti.com/docs/prod/folders/print/tms320dm365.html.

TMS320DM368 - http://focus.ti.com/docs/prod/folders/print/tms320dm368.html

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1 Overview

1.1 Pin Map and Memory Map

The pin map and memory map are the same for both DM365 and DM368 devices.

1.2 Feature Differences

Table 1 shows the feature differences between the DM365 and DM368 devices.

Table 1. DM365 and DM368 Major System Block Clocking Feature Differences

	DM365-216	DM365-270	DM365-300	DM368
ARM926 RISC	216 MHz	270 MHz	300 MHz	432 MHz
Co-Processor (HDVICP)	173 MHz	216 MHz	270 MHz	340 MHz
Co-Processor (MJCP)	173 MHz	216 MHz	270 MHz	340 MHz
DDR2	173 MHz	216 MHz	270 MHz	340 MHz
mDDR	168 MHz	168 MHz	168 MHz	168 MHz
VPSS Logic Block	173 MHz	216 MHz	270 MHz	340 MHz
Peripheral System Bus and EDMA	86.5 MHz	108 MHz	135 MHz	170 MHz
VPBE-VENC	27 MHz	74.25 MHz	74.25 MHz	74.25 MHz
VPFE	120 MHz	120 MHz	12 0 MHz	120 MHz

1.3 Board Hardware Changes

This section describes hardware changes needed to migrate from TMS320DM365 to TMS320DM368.

1.3.1 Minimum Changes Required

Table 2 summarizes the minimum required changes for DM368 432 MHz operation. These changes will be required in all systems, unless the current DM365 design already meets or exceeds the new requirement.

Table 2. Minimum Required Changes

Component	Change To	Comments
CVDD Core Power Supply	Core power supply is changed from 1.2V (216 MHz and 270 MHz DM365 devices) to 1.35V for the DM368 device; the DM365 300 MHz device also operates at 1.35V. The power supply design needs to account for the additional current consumed when running at a higher frequency for DM368.	DM368 432 MHz operation has higher CVDD power demands than 300 MHz parts. Systems where the power supply was barely adequate to supply 300 MHz parts will require larger power supplies for 432 MHz DM368.
DDR2 memory	DDR2-800	In order to support a DDR2 clock frequency of 340 MHz, a 2x speed or greater DDR2 memory chip is required.

1.3.2 Probable Changes

Table 3 summarizes other changes that are likely to be required by systems of typical design. These changes will not necessarily be required in all systems. Therefore, each of these probable changes should be evaluated to determine if they are necessary for any given design.

Table 3. Probable Changes

Component	Change To	Comments
Video Port Back-end Display Video Encoder Clock generation from Internal PLLs	External clock source need: 74.25 MHz for displaying HD video whenever an Oscillator frequency of 24 MHz or at 19.2 MHz is used.	At 432 MHz, and when using either the recommended 24 MHz or 19.2 MHz external crystal oscillators, the DM368 PLL multipliers and dividers can not produce exact 74.25 MHz frequencies. In systems where the VPBE or other parts are relying on internal clock sources to generate these frequencies, the need for an external clock will be required. The external clock source can be an existing clock source in the design of the correct frequency, a fixed-frequency Oscillator or Crystal Clock Generator, or an external programmable can be used.
Voice Codec Frequency		A 432 MHz functional clock will result in DM368 voice codec sampling frequency of 16.07KHz. The difference of 0.4375% versus 16KHz specification should be acceptable for the majority of audio applications. If the DM368 voice codec is required to operate at precisely 16KHz, then the functional clock can be reduced to achieve precisely that sample frequency. However, the ARM926 and HDVICP will have to run at a reduced rate, resulting in lower video performance.

1.3.3 Other Potentially Required Changes

Table 4 summarizes other changes that may be required in some systems. These changes will not necessarily be required in all systems. Therefore, each of these changes should be evaluated to determine if they are necessary for any given design.

Table 4. Other Potentially Required Changes

Component	Change To	Comments
Heat Sink	Larger capacity heat sink	Systems where the heat sink was barely adequate to cool a 300 MHz DM365 device will require larger heat sinks for a 432 MHz DM368 device.

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