Application Report
SPRACA0–July 2017

AM572x Power Estimation Tool

Catalog Processors

ABSTRACT

The power estimation spreadsheet provides power consumption estimates based on measured and simulated data; they are provided “as is” and are not guaranteed within a specified precision. Power consumption depends on electrical parameters, silicon process variations, environmental conditions, and uses cases running on the processor during operation. Actual power consumption should be verified in the real system. This power estimation spreadsheet is preliminary and subject to change.

The spreadsheet mentioned in this document can be downloaded from the following URL: http://www.ti.com/lit/zip/spraca0.

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Trademarks

1 Using the Power Estimation Tool

The input part of the spreadsheet consists of four sections: General, DDR configuration, Operating Performance Point and Use Case Input. To use the input part of the spreadsheet, users need to modify the input fields with their appropriate usage parameters. Cells that are designed for user input are light blue in color. Simply configure the light blue cells to a value most closely aligned with your intended scenario.

Briefly, the purpose of each of the four sections is:

- General: configure the high-level system configuration such as junction temperature, power estimation mode and AVS options.
- DDR configuration: configure DDR type, frequency, the number of channels, bit width and ECC options.
- Operating Performance Point: configure MPU, DSP, IVA and GPU OPP. CORE is fixed to OPP_NOM.
- I/O Voltage: Select IO voltage of each voltage domains.

1.1 Macro Buttons

The spreadsheet includes macros.

The input part of the spreadsheet has command buttons to run macros.

"Reset" - Set all input fields to default values.

1.2 General

This section allows users to set a junction temperature (not ambient temperature) between 0°C and 105°C, power estimation mode and AVS option.

- Junction Temperature (°C) : 0 approximately 105 (negative values are not supported in the tool)
- Power Estimation Mode : Max, Typ ('Max' accounts for the worst-case silicon process variation)
- AVS Class : None or Class 0. AVS is required for all operating performance points. Disabling AVS in

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this option is just to estimate power reduction by the AVS.

1.3 DDR Configuration

This section allows you to set DDR configuration parameters.

- Type: DDR3 or DDR3L
- Frequency: DDR clock frequency. 303, 400 or 532 MHz
- Channels: The number of EMIF channels. 1 or 2.
- Width: DDR data width. 16 or 32 bits.
- ECC Enabled: Hardware ECC option. Yes or No.

1.4 Operating Performance Point (OPP)

This section allows you to set an operating performance point (OPP) for MPU, DSP, IVA and GPU. CORE voltage domain should always be at OPP_NOM.

- VDD_MPU: select from OPP_NOM, OPP_OD or OPP_HIGH
- VDD_DSP: select from OPP_NOM, OPP_OD or OPP_HIGH
- VDD_IVA: select from OPP_NOM, OPP_OD or OPP_HIGH
- VDD_GPU: select from OPP_NOM, OPP_OD or OPP_HIGH
- VDD_CORE: OPP_NOM only

1.5 I/O Voltage

This section allows you to select 1.8 V or 3.3 V for each dual voltage IO domains (VDDSHV1-11).

1.6 Use Case Input

- Power Domain: Power domain information for each modules.
- Module: Name of processing cores or peripheral modules.
- Frequency (MHz): The module operating frequency specified by the OPP configuration.
- State: Specifies whether a peripheral is Enabled and configured for use, or Disabled and unconfigured.
- Processing
  - Profile: Selects the peripheral-specific configuration mode.
  - Utilization (%): Specifies the utilization as a percentage of processing load relative to a full load condition.
- Transfer (DDR or I/O)
  - Read (MB/s): Specifies the data transfer rate the module is receiving versus transmitting.
  - Write (MB/s): Specifies the data transfer rate the module is transmitting versus receiving.
  - I/O Frequency: Specifies the I/O frequency of the module.
  - I/O Pins: Specifies the number of data I/O pins used in the use case scenario.
  - I/O Group: Specifies the dual voltage I/O power supply bank of the I/O pins used by the module.

1.7 AM572x Power Consumption

The power estimation tool generates a power analysis report in this section. The report lists power supply name, voltage in V, current in mA and power consumption in mW per power rail groups. The total power consumption in mW is listed at the end of the table.

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2 Important Notes and Limitations

The following notes and limitations apply to the AM572x Power Estimation Tool:

It is up to the user to input reasonable utilization numbers for the MPU subsystem for the purposes of maximum power analysis. 90-100% loading on the subsystem is not realistic for most application scenarios.

3 References

1. *Change macro security settings in Excel (Office 2010)*
2. *Change macro security settings in Excel (Office 2007)*

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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