

# AM570x Power Estimation Tool

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## ABSTRACT

The Power Estimation Tool (PET) allows users to gain insight into the power consumption of AM570x Sitara processors. The tool includes the ability for the user to choose multiple application scenarios and understand the power consumption, as well as how advanced power saving techniques can be applied to further reduce overall power consumption.

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## 1 Introduction

The Power Estimation Tool (PET) allows users to gain insight into the power consumption of AM570x Sitara processors. The tool includes the ability for the user to choose multiple application scenarios and understand the power consumption, as well as how advanced power saving techniques can be applied to further reduce overall power consumption.

The PET spreadsheet is comprised of two parts:

- Input – The input part of the spreadsheet is the mechanism in which users input device parameters needed for their application. Parameters include environmental configurations, DDR configurations, Operating Performance Point, dual voltage I/O voltage, and use case input.
- Output – The output part of the spreadsheet contains the information on SoC power consumption based on power calculations in the spreadsheet. The output report which includes voltage, current, and power is shown in the AM570x power consumption section.

The data presented in the PET spreadsheet are based on measurements performed on AM570x silicon, as well as estimates.

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**NOTE:** The AM570x PET applies to AM5706 and AM5708 devices.

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**NOTE:** This power estimation spreadsheet is preliminary and subject to change.

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**NOTE:** This 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.

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## 2 Using the Power Estimation Tool

Download the correct spreadsheet for the device speed grade.

Download AM570x Power Estimation Tool (PET) Spreadsheet [here](#).

Download AM5706xxD Power Estimation Tool (PET) Spreadsheet [here](#).

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, modify the input fields with their appropriate usage parameters. Cells that are designed for user input are light blue in color. 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, 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 the I/O voltage of each voltage domain.

### 2.1 Macro Buttons

The spreadsheet includes macros. If you cannot run macros, review your Excel security settings described in below articles.

[Change macro security settings in Excel \(Office 2010\)](#)

[Change macro security settings in Excel \(Office 2007\)](#)

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

- Reset – Set all input fields to default values.

### 2.2 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 ~ 105 (negative values are not supported in the tool)
- Power Estimation Mode: Typ or Max (Typ is the power consumption of most devices, Max is the worst-case possible due to silicon variation)
- AVS Class: None or Class 0. AVS is required for all operating performance points. Only disable AVS to estimate the power advantage.

### 2.3 DDR Configuration

This section allows the user to set DDR configuration parameters.

- Type: DDR3 or DDR3L
- Frequency: DDR clock frequency. 303, 400, 532, 600, or 666 MHz
- Width: DDR data width. 16 or 32 bits.
- ECC Enabled: Hardware ECC option. Yes or No.

## 2.4 Operating Performance Point

This section allows the user to set an operating performance point (OPP) for DSP and IVA. The VDD\_CORE domain is always OPP\_NOM.

- VDD\_MPU: OPP\_NOM only
- VDD\_DSP: select from OPP\_NOM, OPP\_OD, or OPP\_HIGH
- VDD\_IVA: select from OPP\_NOM, OPP\_OD, or OPP\_HIGH
- VDD\_GPU: OPP\_NOM only
- VDD\_CORE: OPP\_NOM only

## 2.5 I/O Voltage

This section allows the user to select 1.8 V or 3.3 V for each dual-voltage I/O domains (VDDSHV1-11).

## 2.6 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.

## 2.7 AM570x 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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