

Application Note
AM273x Power Estimation Tool



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 use cases running on the processor during operation. Actual power consumption should be verified in the real system. This tool is meant for estimating power consumption during realistic operating modes; it is not intended for power supply sizing. This power estimation spreadsheet is preliminary and subject to change.

The spreadsheet mentioned in this document can be downloaded from the following URL: <https://www.ti.com/lit/zip/SPRM803>.

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1 Using the Power Estimation Tool

The input part of the spreadsheet consists of the following three sections: Processing Elements, Interfaces, and Power Report.

To use the input part of the spreadsheet, users must modify the fields with their appropriate usage parameters. Cells designed for user input are in yellow. Fields that cannot be modified are gray. Fields in blue are the output calculated power. Configure the yellow cells to a value most closely aligned with your intended scenario.

The purpose of each of these sections is:

- Processing Elements:
 - Configure frequency of operation for R5F, M4, and DSP and HWA
 - User-estimated percent utilization of each core
- Interfaces:
 - Subset of commonly used major interfaces with selectable mode
 - Subset of commonly used major interfaces with percent utilization
- Power Report:
 - Selectable VDD, VDD_SRAM, VIOIN
 - Power estimation output by rail
 - Power rails are aligned with EVM design

1.1 Processing Elements

This section describes how to set operating frequency, mode, and how to load each compute core with utilization between 0%-100% (inclusive). [Table 1-1](#) lists the selectable options.

Table 1-1. Processing Elements

Processing Element	Frequency	Utilization
C66x DSP	450 MHz, 300 MHz, 0 MHz	0 – 100%
HWA	400 MHz	0 – 100%
R5F	400 MHz, 200 MHz	0 – 100%
HSM(Hardware Security Module)	400 MHz	0 – 100%

1.2 Interfaces

This section describes how to select both modes and utilization of the subset of commonly used interfaces on the AM273x, including CSI2, QSPI, Aurora, Ethernet, McASP, CAN, and SPI. [Table 1-2](#) lists the selectable options.

Table 1-2. Interfaces

Interface	Mode	Utilization
CSI2	Lane – 1,2,3,4 Mbps – 300, 600	N/A
Aurora LVDS	OFF, 150, 225, 400,450,600 and 900 mbps	N/A
QSPI	Master, Slave, 67 Mbaud, 60 Mbaud and 40 Mbaud	0-100 %
Ethernet	RGMII,RMII, MII, 10, 100, 1.8v, 3.3v, Off, Unused	0-100 %
CAN A MSS	250kbps, 1,5, 8 mbps, 1.8V, 3.3V, Off, Unused	0-100%
SPI A MSS	Master, Slave, 1.563, 2.083, 3.125, 6.25, 12.5, 25 mbps, 1.8V, 3.3V, Off, Unused	0-100%

1.3 Power Report

The power estimation tool generates a power analysis report described in this section. The report lists the power supply name, voltage in Volts (V), and power consumption in Watts (W) per power rail groups. Power rail groups match the AM273x EVM design.

There is a selectable field for junction temperature configuration:

Temperature (Tj C): -40, -20, 25, 50, 75, 85, 100, 105, 125, 140, 150.

For following power rails, there are selectable fields. [Table 1-3](#) lists the options.

Table 1-3. Power Rails

Voltage Rail	Selectable Options (V)
VDD	1.15, 1.175, 1.20,1.23, 1.25,1.28, 1.30
VDD_SRAM	1.15, 1.175, 1.20,1.23, 1.25,1.28, 1.30
VIOIN	1.71, 1.8, 1.89, 3.135,3.3,3.465

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