

**Intelligent
Systems**

Intel® Atom™ Processor E3800 Product Family

**Application Power Guidelines Addendum
For Intelligent Systems**

December 2014



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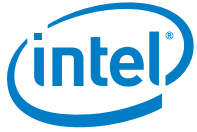
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Revision History

Date	Revision	Description
December 2014	003	Updated processor names.
February 2014	002	Updated test configuration format.
November 2013	001	Initial release.

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1 Introduction

This document provides power data on the Intel® Atom™ Processor E3800 Product Family while running industry standard benchmarks. This document is complementary to the specifications published in the product datasheet, but does not replace the specifications.

The Applications Power Guidelines (APG) should be used for reference only. The power data provided in this document are not design points and should not be used as such.

Additional information about Applications Power Guidelines is provided in the [Table 1](#) Related Documents. Refer to the documents in [Table 2](#) for additional information.

1.1 Related Documents

Table 1. Related Documents

Document Title	Document Number/Location
<i>Application Power Guideline for Intel® Embedded Processors</i>	http://www.intel.com/content/www/us/en/intelligent-systems/embedded-appl-power-guideline-paper.html

1.2 Reference Documents

Table 2. Reference Documents

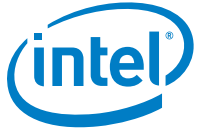
Document Title	Document Number/Location
<i>Intel® Atom™ Processor E3800 Product Family Datasheet</i>	538136
<i>Intel® Atom™ Processor E3800 Product Family Platform Design Guide</i>	512379
<i>Intel® Atom™ Processor E3800 Product Family Thermal Design Guide</i>	514271

NOTE: Contact the local Intel representative for the most recent revision of these documents.

1.3 Terminology

Table 3. Terminology

Term	Description
APG	Application Power Guidelines



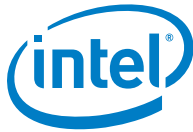
Term	Description
FFT	Fast Fourier Transform
SKU	Stock Keeping Unit
TDP	Thermal Design Power

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2 *Application Power Guidelines*

The Application Power Guidelines (APG) data listed in this document are intended to reflect the typical use conditions. Factors such as temperature, platform configuration, and other variables can influence power usage. Specific information about the platform and test configurations is provided in this document to enable a repeatable power measurement.



2.1 Application Power Guidelines for the Intel® Atom™ E3845 Processor

Figure 1 indicates the application power guidelines for various embedded applications for the Intel® Atom™ E3845 Processor with a 10W TDP specification.

Figure 1. Intel® Atom™ E3845 Processor Application Power Guidelines

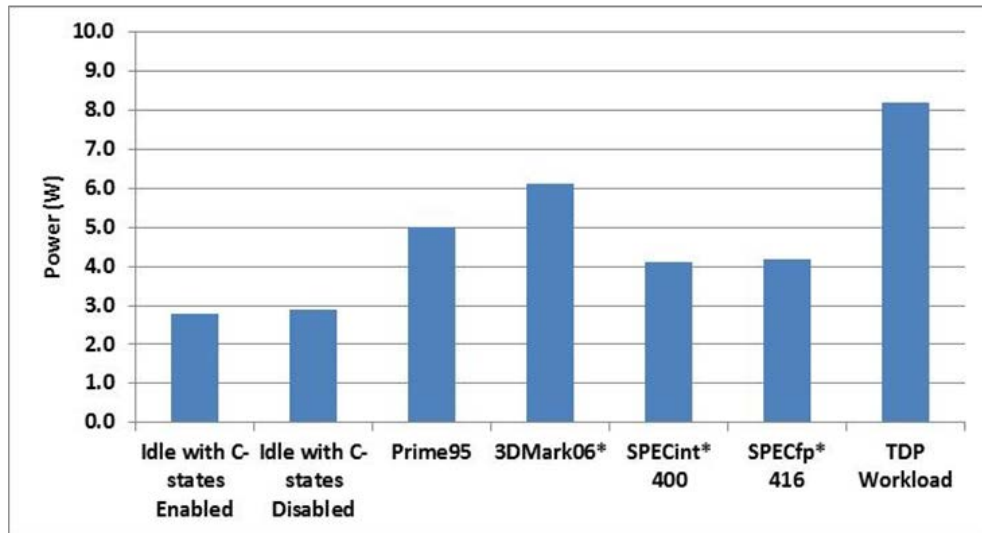


Table 4. Intel® Atom™ E3845 Processor Application Power Guidelines

Application/Benchmark	SoC Power (W)	Junction Temperature (°C)
Idle with C-states Enabled	2.8	44
Idle with C-states Disabled	2.9	44
Prime95	5.0	51
3DMark06*	6.1	56
SPECint* 400	4.1	46
SPECfp* 416	4.2	46
TDP Workload	8.2	63

NOTES:

- Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.
- Configuration details are listed in [Section 3. Configuration and Disclaimer](#).
Source: Intel internal testing as of October 2013.



2.2 Application Power Guidelines for the Intel® Atom™ E3827 Processor

Figure 2 indicates the application power guidelines for various embedded applications for the Intel® Atom™ E3827 Processor with an 8W TDP specification.

Figure 2. Intel® Atom™ E3827 Processor Application Power Guidelines

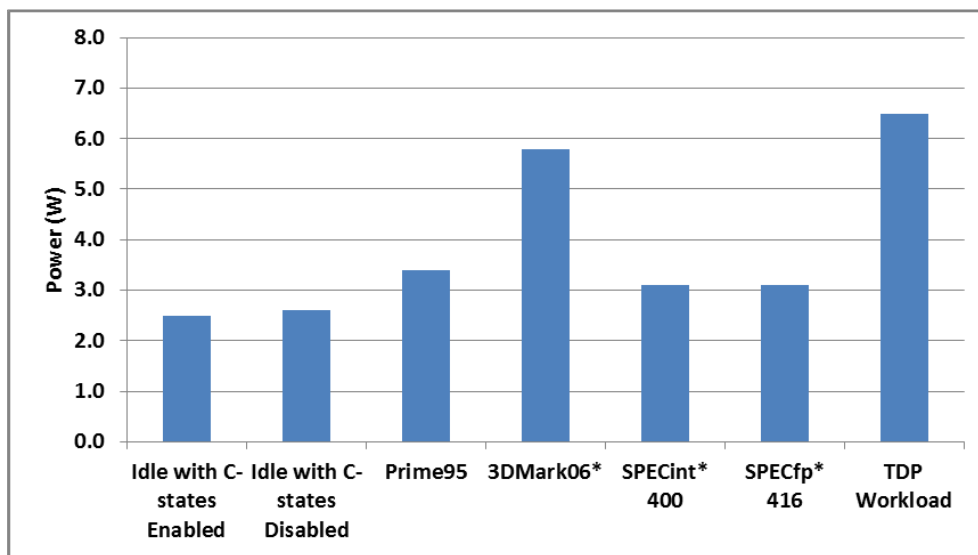
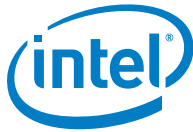


Table 5. Intel® Atom™ E3827 Processor Application Power Guidelines

Application/Benchmark	SoC Power (W)	Junction Temperature (°C)
Idle with C-states Enabled	2.5	41
Idle with C-states Disabled	2.6	41
Prime95	3.4	44
3DMark06*	5.8	54
SPECint* 400	3.1	43
SPECfp* 416	3.1	43
TDP Workload	6.5	58

NOTES:

1. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.
2. Configuration details are listed in [Section 3. Configuration and Disclaimer](#). Source: Intel internal testing as of October 2013.



2.3 Application Power Guidelines for the Intel® Atom™ E3826 Processor

Figure 3 indicates the Application Power Guidelines for various embedded applications for the Intel® Atom™ E3826 Processor with a 7W TDP specification.

Figure 3. Intel® Atom™ E3826 Processor Application Power Guidelines

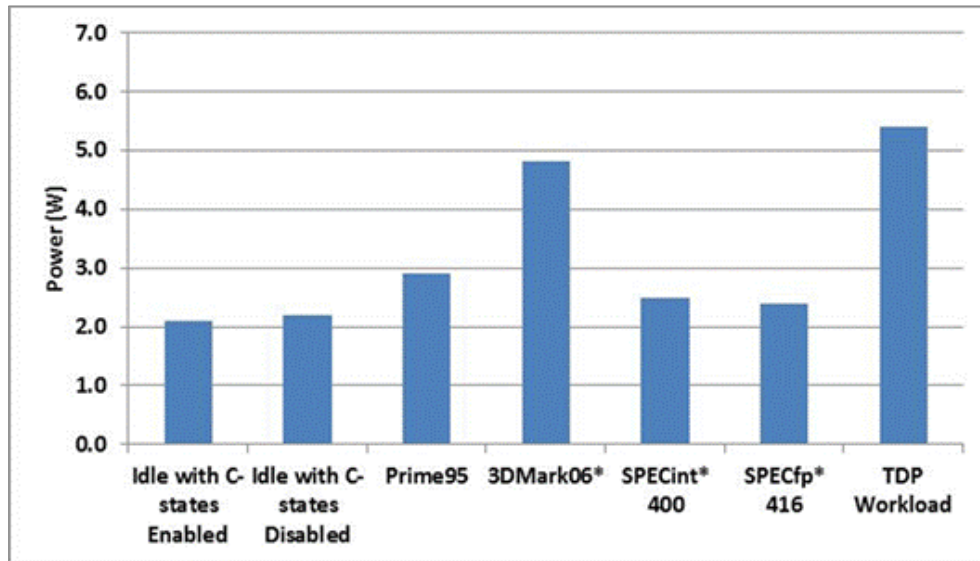
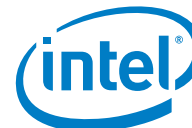


Table 6. Intel® Atom™ E3826 Processor Application Power Guidelines

Application/Benchmark	SoC Power (W)	Junction Temperature (°C)
Idle with C-states Enabled	2.1	39
Idle with C-states Disabled	2.2	39
Prime95	2.9	42
3DMark06*	4.8	50
SPECint* 400	2.5	41
SPECfp* 416	2.4	41
TDP Workload	5.4	53

NOTES:

- Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.
- Configuration details are listed in [Section 3. Configuration and Disclaimer](#).
Source: Intel internal testing as of October 2013.



2.4 Application Power Guidelines for the Intel® Atom™ E3825 Processor

Figure 4 indicates the application power guidelines for various embedded applications for the Intel® Atom™ E3825 Processor with a 6W TDP specification.

Figure 4. Intel® Atom™ E3825 Processor Application Power Guidelines

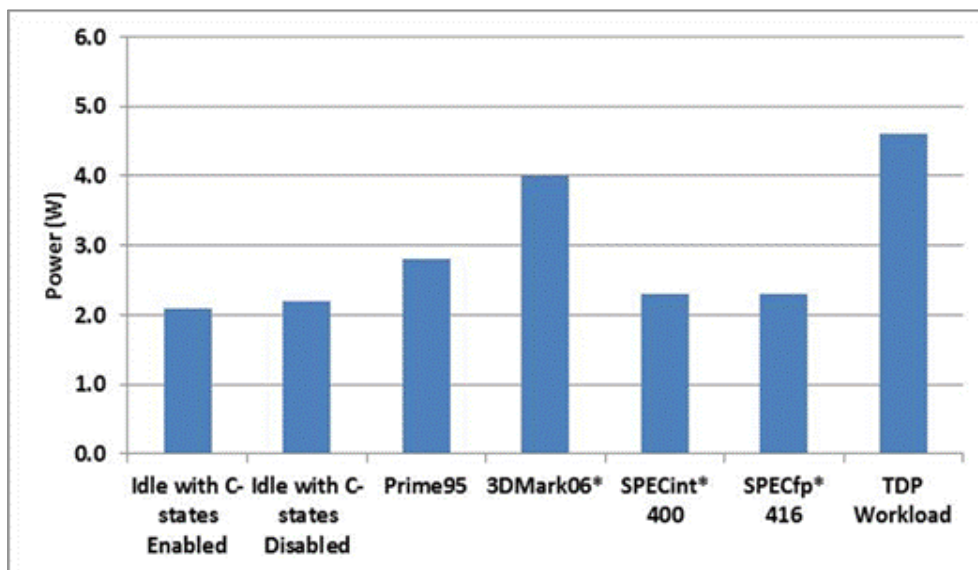
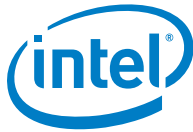


Table 7. Intel® Atom™ E3825 Processor Application Power Guidelines

Application/Benchmark	SoC Power (W)	Junction Temperature (°C)
Idle with C-states Enabled	2.1	39
Idle with C-states Disabled	2.2	39
Prime95	2.8	43
3DMark06*	4.0	47
SPECint* 400	2.3	40
SPECfp* 416	2.3	40
TDP Workload	4.6	50

NOTES:

- Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.
- Configuration details are listed in [Section 3. Configuration and Disclaimer](#).
Source: Intel internal testing as of October 2013.



2.5 Application Power Guidelines for the Intel® Atom™ E3815 Processor

Figure 5 indicates the application power guidelines for various embedded applications for the Intel® Atom™ E3815 Processor with a 5W TDP specification.

Figure 5. Intel® Atom™ E3815 Processor Application Power Guidelines

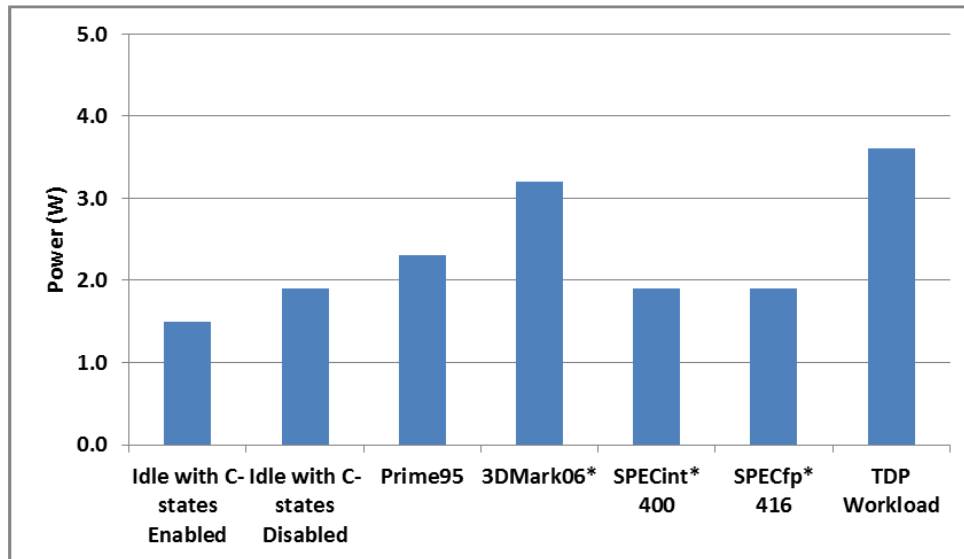


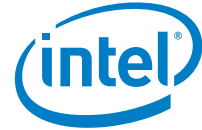
Table 8. Intel® Atom™ E3815 Processor Application Power Guidelines

Application/Benchmark	SoC Power (W)	Junction Temperature (°C)
Idle with C-states Enabled	1.5	37
Idle with C-states Disabled	1.9	38
Prime95	2.3	40
3DMark06*	3.2	43
SPECint* 400	1.9	39
SPECfp* 416	1.9	39
TDP Workload	3.6	45

NOTES:

- Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.
- Configuration details are listed in [Section 3. Configuration and Disclaimer](#).
Source: Intel internal testing as of October 2013.

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3 Configuration and Disclaimer

The APG data represent a typical or average processor SKU and do not include part-to-part power variation. The APG data are not intended to replace TDP, or to be used for reliability assessments. Individual test results may vary.

Software and workloads used in the performance tests may have been optimized for performance only on Intel processors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. Consult other information and performance tests to assist in fully evaluating contemplated purchases, including the performance of that product when combined with other products.

3.1 APG Configuration

The results presented in this document are collected on a single sample. The data has not been post processed to account for part-to-part power variation.

- Platform: Bayley Bay** Fab 3 CRB
 - Processor 1: Intel® Atom™ E3845 Processor with a 10W TDP specification
 - Processor 2: Intel® Atom™ E3827 Processor with an 8W TDP specification
 - Processor 3: Intel® Atom™ E3826 Processor with a 7W TDP specification
 - Processor 4: Intel® Atom™ E3825 Processor with a 6W TDP specification
 - Processor 5: Intel® Atom™ E3815 Processor with a 5W TDP specification
- BIOS Rev.: BYTICRB_IA32_R_SPI_P056_43_SeC_Enable.
- Memory: 2x Hynix* 2 GB 1Rx8 DDR3L/1333 MHz.
- Operating System: Windows* 8 Pro, Linux* CentOS* 6.4.
- Windows Benchmarks: Windows 8 Software: 3DMark06* (Pixel Shader), Prime95 version 27.9.1 (large FFT), and TDP Workload (3DMark06* + Prime95).
- Linux Benchmarks: SPEC* CPU2006.1.2 (400.Perlbench for SPECint* 400, 416.Gamess for SPECfp* 416).
- A reference heat sink with fan was used while running these benchmarks.
- Application Power Guidelines testing was conducted by Intel Corporation.
- For more information, go to <http://www.intel.com/performance>.



3.2 Additional Information:

- In case of conflict, the datasheet supersedes this document.
- The temperature values are mean temperatures measured through the duration of the test.
- The idle power reported above is while displaying the Windows desktop screen.
- 3DMark06* is a 3D game performance benchmark. Power was measured while running a feature test "Pixel Shader" at resolution 1920 x 1080.
- SPEC* CPU2006 is one of the most widely used industry standard benchmark for evaluating IA CPU compute capabilities. The CINT benchmark used in this test is 400.Perlbench. The CFP benchmark used in this test is 416.gamess.
- TDP workload is a combination of Prime95 (large FFT) and 3DMark* (Pixel Shader) running concurrently.

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