AMD Athlon™ 64 Sempron Processor Power and Thermal Data Sheet

Publication # **30430**
Revision: **3.51**
Issue Date: **March 2006**

Advanced Micro Devices

Parameter/OPN	Notes	SDA2600AIO2BX		SDA2800AIO3BX		SDA3000AIO2BX	
Model Number		2600+		2800+		3000+	
CPUID 8000_0001h EBX [11:6] (BrandID)	1	26h		26h		26h	
CPUID 8000_0001h EAX [31:0] (CPUID)	1	00020FC2h		00020FC2h		00020FC2h	
FID/VID Status MaxVID Field	2	04h		04h		04h	
FID/VID Status MaxFID Field	2	08h		08h		0Ah	
FID/VID Status StartVID Field	2	06h		06h		06h	
FID/VID Status StartFID Field	2	08h		08h		0Ah	
L2 Cache Size		128 KB		256 KB		128 KB	
Max P-State		1600 MHz		1600 MHz		1800 MHz	
VID Code / VID_VDD	3	06h	1.400 V	06h	1.400 V	06h	1.400 V
Thermal Design Power	4	59.0 W		59.0 W		59.0 W	
Intermediate P-State #1	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Intermediate P-State #2	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Intermediate P-State #3	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Intermediate P-State #4	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Intermediate P-State #5	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Intermediate P-State #6	5	N/A		N/A		N/A	
VID Code / VID_VDD	3						
Thermal Design Power	4						
Min P-State		N/A		N/A		1000 MHz	
VID Code / VID_VDD	3					12h	1.100 V
Thermal Design Power	4					21.7 W	

The notes for this table appear on page 67.

Notes:

1 CPUID extended function 8000_0001h fields are used by BIOS in uniquely associating a given processor to the Pstates that are valid for that processor. Refer to the BIOS and Kernel Developer' s Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094.

2 FIDVID Status Register, MSR C001_0042h.

3 The VID_VDD voltage is the VID[4:0] requested VDD supply level. Refer to the appropriate functional data sheet for details.

4 Thermal Design Power (TDP) is measured under the conditions of Tcase Max, IDD Max, and VDD=VID_VDD, and include all power dissipated on-die from VDD, VDDIO, VLDT, VTT, and VDDA.

5 Implementation of this P-state is optional in BIOS.

Parameter/OPN	Notes	SDA2600AIO2BX	SDA2800AIO3BX	SDA3000AIO2BX
Tcase Max	1	69°C	69°C	69°C
Tcontrol Max	2	70°C	70°C	70°C
Tambient		42°C	42°C	42°C
Thermal Resistance (case-amb)		0.45°C/W	0.45°C/W	0.45°C/W
Max P-State		1600 MHz	1600 MHz	1800 MHz
VID_VDD	3	1.400 V	1.400 V	1.400 V
IDD Max		40.6 A	40.6 A	40.6 A
Thermal Design Power	4	59.0 W	59.0 W	59.0 W
Intermediate P-State #1	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Intermediate P-State #2	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Intermediate P-State #3	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Intermediate P-State #4	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Intermediate P-State #5	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Intermediate P-State #6	11	N/A	N/A	N/A
VID_VDD	3			
IDD Max				
Thermal Design Power	4			
Min P-State		N/A	N/A	1000 MHz
VID_VDD	3			1.100 V
IDD Max				17.7 A
Thermal Design Power	4			21.7 W
Halt/Stop Grant				
IDDC1 Max @ Max P-State	5	21.6 A	21.6 A	21.6 A
IDDC1 Max @ Min P-State	6	N/A	N/A	4.6 A
I/O Power	8, 12	2.2 W	2.2 W	2.2 W
S3	7			
I/O Power	7, 9, 12	500 mW	500 mW	500 mW

The notes for this table appear on page 74.

Notes:

1. Tcase max is the maximum case temperature specification which is a physical value in degrees Celsius. This value is programmed into Rev D and later processors. Refer to the appropriate functional data sheet, and the THERMTRIP Status Register in the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094.
2. Tcontrol max (maximum control temperature) is a non physical temperature on an arbitrary scale that can be used for system thermal management policies. Tcontrol max represents the value at which the processor has reached Tcase max when measuring the thermal diode with a dual sourcing current temperature sensor. Refer to the appropriate functional data sheet, and the THERMTRIP Status Register in the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094.
3. The VID_VDD voltage is the VID[4:0] requested VDD supply level. Refer to the appropriate functional data sheet for details.
4. Thermal Design Power (TDP) is measured under the conditions of Tcase Max, IDD Max, and VDD=VID_VDD, and include all power dissipated on-die from VDD, VDDIO, VLDT, VTT, and VDDA.
5. Assumes Tcase max, max P-state VID_VDD, clock divider set to 32.
6. Assumes 50°C, min P-state VID_VDD, clock divider set to 32.
7. Assumes 35°C, VDD, VDDA, and VLDT supplies are off, VDDIO and VTT are powered, memory in self-refresh mode and DDR SDRAM interface tri-stated except CKE pins. Refer to the appropriate functional data sheet for complete VDDIO and VTT power supply specifications.
8. Thermal Design Power dissipated by the processor VDDIO, VTT, VLDT, and VDDA power planes only.
9. Thermal Design Power dissipated by the processor VDDIO and VTT power planes only.
10. Refer to the AMD Athlon™ 64 Processor Desktop Power Roadmap, order #26882, for IDD Max and Thermal Design Power requirements for future processor revisions.
11. Implementation of this P-state is optional in BIOS.
12. Assumes VDDIO = 2.6 V and VTT = VDDIO / 2. Refer to the appropriate functional data sheet for complete VDDIO and VTT power supply specifications.