

Parameter/OPN	Notes	OSA146CEP5AT			OSA148CEP5AT		
		OSA246CEP5AU			OSA248CEP5AU		
		OSA846CEP5AV			OSA848CEP5AV		
Model Number		146	246	846	148	248	848
CPUID 8000_0001h EBX [11:6] (BrandID)	1	0Ch	10h	14h	0Ch	10h	14h
CPUID 8000_0001h EAX [31:0] (CPUID)	1	00000F5Ah			00000F5Ah		
L2 Cache Size		1 MB			1 MB		
FID/VID Status MaxFID Field	2	0Ch			0Eh		
FID/VID Status StartFID Field	2	0Ch			0Eh		
<b>Max P-State</b>		2000 MHz			2200 MHz		
FID/VID Status MaxVID Field	2	00h			00h		
FID/VID Status StartVID Field	2	02h			02h		
VID Code		02h			02h		
VID_VDD	4	1.500 V			1.500 V		
Thermal Design Power	5	89.0 W			89.0 W		
<b>Intermediate P-State #1</b>	6	1800 MHz			2000 MHz		
VID Code / VID_VDD	4	06h	1.400 V		06h	1.400 V	
Thermal Design Power	5	66.0 W			70.0 W		
<b>Intermediate P-State #2</b>	6	N/A			1800 MHz		
VID Code / VID_VDD	4				0Ah	1.300 V	
Thermal Design Power	5				47.0 W		
<b>Intermediate P-State #3</b>	6	N/A			N/A		
VID Code / VID_VDD	4						
Thermal Design Power	5						
<b>Min P-State</b>		1000 MHz			1000 MHz		
VID Code / VID_VDD	4	0Eh	1.200 V		0Eh	1.200 V	
Thermal Design Power	5	28.0 W			28.0 W		

The notes for this table appear on page 26.

**Notes:**

1. CPUID extended function 8000\_0001h fields are used by BIOS in uniquely associating a given processor to the P-states 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. StartVID and MaxVID are programmed during device manufacturing with part-specific values for Rev E and later processors with 'Variable' indicated by the Operating Voltage OPN character, and can have one or more valid options. All valid options for StartVID, MaxVID, and VID\_VDD will be specified for the corresponding OPN. For information on the relationship of StartVID and MaxVID to VID\_VDD refer to the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094.
4. The VID\_VDD voltage is the VID[4:0] requested VDD supply level. Refer to the appropriate functional data sheet for details.
5. Thermal Design Power (TDP) is measured under the conditions of Tcase Max and VDD=VID\_VDD, and include all power dissipated on-die from VDD, VDDIO, VLDT, VTT, and VDDA. Contact your Field Application Engineer for more information on TDP specifications.
6. Implementation of this P-state is optional in BIOS.
7. Limited availability.
8. Thermal Design Power (TDP) specifications for dual core processors assume equivalent P-states (Voltage and frequency) and equivalent Tcase conditions for both cores. Refer to the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094, for details on P-state operation for dual core processors.

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Tcase Max	1	70°C	70°C
Tcontrol Max	3	70°C	70°C
Tambient		42°C	42°C
Thermal Resistance (case to ambient)		0.31°C/W	0.31°C/W
<b>Max P-State</b>		2000 MHz	2200 MHz
VID_VDD	4	1.500 V	1.500 V
IDD Max		56.5 A	56.5 A
Thermal Design Power	5	89.0 W	89.0 W
<b>Intermediate P-State #1</b>	12	1800 MHz	2000 MHz
VID_VDD	4	1.400 V	1.400 V
IDD Max		44.2 A	47.1 A
Thermal Design Power	5	66.0 W	70.0 W
<b>Intermediate P-State #2</b>	12	N/A	1800 MHz
VID_VDD	4		1.300 V
IDD Max			33.0 A
Thermal Design Power	5		47.0 W
<b>Intermediate P-State #3</b>	12	N/A	N/A
VID_VDD	4		
IDD Max			
Thermal Design Power	5		
<b>Min P-State</b>		1000 MHz	1000 MHz
VID_VDD	4	1.200 V	1.200 V
IDD Max		19.9 A	19.9 A
Thermal Design Power	5	28.0 W	28.0 W
<b>Halt/Stop Grant</b>			
IDDC1 Max @ Max P-State	7	32.5 A	32.5 A
IDDC1 Max @ Min P-State	8	8.2 A	8.2 A
I/O Power	10	4.1 W	4.1 W
<b>S3</b>	9		
I/O Power	9, 11	750 mW	750 mW

The notes for this table appear on page 44.

**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 AMD Functional Data Sheet, 940 Pin Package, order# 31412, and the THERMTRIP Status Register in the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094.
2. Tcase max is programmed during device manufacturing with part-specific values for Rev E and later processors with 'Variable' indicated by the Case Temperature OPN character, and can be any valid Tcase max value in the range specified for the corresponding OPN.
3. 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 AMD Functional Data Sheet, 940 Pin Package, order# 31412, and the THERMTRIP Status Register in the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094. Temperature is in degrees Celsius on the Tcontrol scale.
4. The VID\_VDD voltage is the VID[4:0] requested VDD supply level. Refer to the appropriate functional data sheet for details.
5. Thermal Design Power (TDP) is measured under the conditions of Tcase Max and VDD=VID\_VDD, and include all power dissipated on-die from VDD, VDDIO, VLDT, VTT, and VDDA. Contact your Field Application Engineer for more information on TDP specifications.
6. Thermal Design Power (TDP) and IDD max for Rev E and later processors with 'Variable' indicated by the Operating Voltage and Case Temperature OPN characters are the limits at the highest Tcase max in the specified range for the corresponding OPN. Products will conform to the TDP and IDD Max limits at all valid voltages. The relationship of Tcase max and Thermal Profile to TDP for a specific device is defined in
7. Assumes Tcase max, VID\_VDD, clock divider set to 32.
8. Assumes 50°C, min P-state VID\_VDD, clock divider set to 32.
9. 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.
10. Thermal Design Power dissipated by the processor VDDIO, VTT, VLDT, and VDDA power planes only.
11. Thermal Design Power dissipated by the processor VDDIO, VTT planes only.
12. Implementation of this P-state is optional in BIOS.
13. Limited availability.
14. Thermal Design Power (TDP) specifications for dual core processors assume equivalent P-states (Voltage and frequency) and equivalent Tcase conditions for both cores. Refer to the BIOS and Kernel Developer's Guide for AMD Athlon™ 64 and AMD Opteron™ Processors, order# 26094, for details on P-state operation for dual core processors.
15. IDDC1 specifications for dual core processors assume equivalent Voltage, clock divisor, and Tcase conditions for both cores.