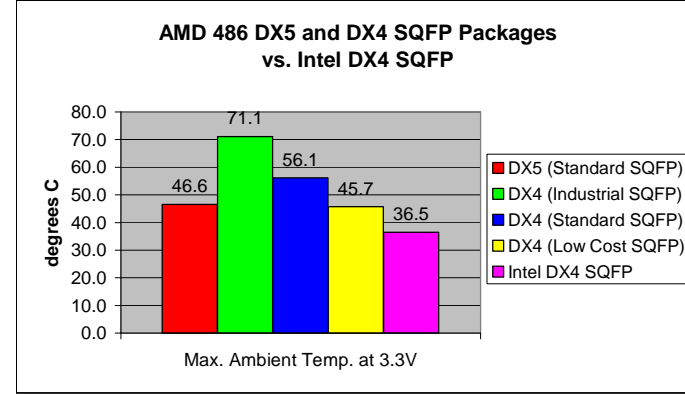
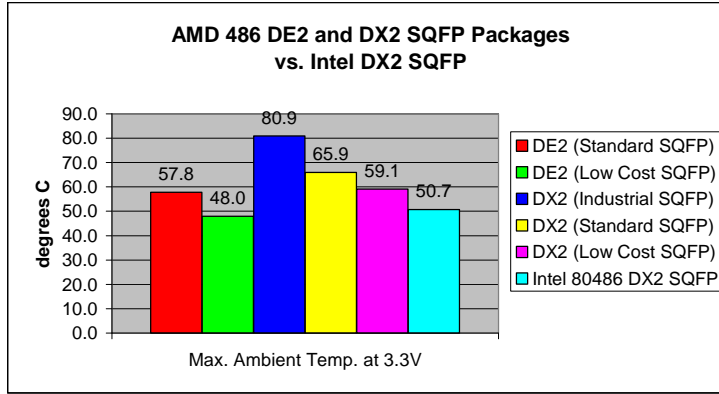


## 486sqfp\_temp4 Comparison

Pastic Packages Only

Thermal Performance Comparison for Am486DX2 and DX4 in the Low Cost (PDH-208) Package vs. the Standard SQFP (PDE-208), and Intel's DX2 and DX4 in the 208-SQFP package.  
1/19/97



Equations:  $T_j = T_{case} + P * \theta_{JC}$   
 $T_A = T_j - P * \theta_{JA}$   
 $T_{case} = T_A + P * (\theta_{JA} - \theta_{JC})$   
 $T_A = T_{case} - P * (\theta_{JA} - \theta_{JC})$

AMD Am486		Enhanced Am486DX Data Sheet Specifications						PDH-208 (Low-Cost SQFP w/ int. heat spreader)				PDE-208 (Standard SQFP w/ ext. heat slug)			
		Voltage (3.0-3.6V)	Icc Spec. (mA/MHz)	Frequency (MHz)	Total Icc (mA)	Power (Watts)	Case Temp. (degrees C)	Theta JC (deg. C/Watt)	Junction Temp.(C)	Theta JA (deg. C/Watt)	Ambient Temp.(C)	Theta JC (deg. C/Watt)	Junction Temp.(C)	Theta JA (deg. C/Watt)	Ambient Temp.(C)
Commercial	Typ.	3.3	8.0	66	528.0	1.74	85	5.5	94.6	22.5	55.4	1.5	87.6	14.0	63.2
	Max.	3.3	10.0	66	660.0	2.18	85	5.5	97.0	22.5	48.0	1.5	88.3	14.0	57.8
	Max.	3.6	10.0	66	660.0	2.38	85	5.5	98.1	22.5	44.6	1.5	88.6	14.0	55.3
Industrial	Typ.	3.3	6.2	66	409.2	1.35	100	Industrial Temp. is Not Supported in the PDH-208 package				1.5	102.0	14.0	83.1
	Max.	3.3	7.0	66	462.0	1.52	100					1.5	102.3	14.0	80.9
	Max.	3.6	7.0	66	462.0	1.66	100					1.5	102.5	14.0	79.2
Commercial	Typ.	3.3	6.2	66	409.2	1.35	85	5.5	92.4	22.5	62.0	1.5	87.0	14.0	68.1
	Max.	3.3	7.0	66	462.0	1.52	85	5.5	93.4	22.5	59.1	1.5	87.3	14.0	65.9
	Max.	3.6	7.0	66	462.0	1.66	85	5.5	94.1	22.5	56.7	1.5	87.5	14.0	64.2
Industrial	Typ.	3.3	6.2	100	620.0	2.05	100	Industrial Temp. is Not Supported in the PDH-208 package				1.5	103.1	14.0	74.4
	Max.	3.3	7.0	100	700.0	2.31	100					1.5	103.5	14.0	71.1
	Max.	3.6	7.0	100	700.0	2.52	100					1.5	103.8	14.0	68.5
Commercial	Typ.	3.3	6.2	100	620.0	2.05	85	5.5	96.3	22.5	50.2	1.5	88.1	14.0	59.4
	Max.	3.3	7.0	100	700.0	2.31	85	5.5	97.7	22.5	45.7	1.5	88.5	14.0	56.1
	Max.	3.6	7.0	100	700.0	2.52	85	5.5	98.9	22.5	42.2	1.5	88.8	14.0	53.5
Industrial	Typ.	3.3	6.2	133	824.6	2.72	100	Industrial Temp. is Not Supported in the PDH-208 package				DX5 is Not Supported in Industrial Temp., PDE-208 package			
	Max.	3.3	7.0	133	931.0	3.07	100								
	Max.	3.6	7.0	133	931.0	3.35	100								
Commercial	Typ.	3.3	6.2	133	824.6	2.72	85	PDH-208 Pkg. is not offered in frequencies above 100MHz				1.5	89.1	14.0	51.0
	Max.	3.3	7.0	133	931.0	3.07	85					1.5	89.6	14.0	46.6
	Max.	3.6	7.0	133	931.0	3.35	85					1.5	90.0	14.0	43.1

**486sqfp\_temp4 Comparison**  
*Pastic Packages Only*

**AMD's PDE-208 Standard SQFP Package Thermal Resistance**

Cooling Mechanism		Theta JA vs. Airflow in Linear ft/min. (m/sec)					
Psi JT		0 (0)	200 (1.01)	400 (2.03)	600 (3.04)	800 (4.06)	
No Heat Sink		1.5	14.0	8.7	7.4	6.4	5.8

Note 2.

**AMD's PDH-208 Low-Cost SQFP Package Thermal Resistance**

Cooling Mechanism		Theta JA vs. Airflow in Linear ft/min. (m/sec)					
Psi JT		0 (0)	200 (1.01)	400 (2.03)	600 (3.04)	800 (4.06)	
No Heat Sink		5.5	22.5	15.4	13.4	11.9	10.9

Note 2.

**AMD's 168 Pin PGA Package Thermal Resistance**

Cooling Mechanism		Theta JA vs. Airflow in Linear ft/min. (m/sec)					
Theta JC		0 (0)	200 (1.01)	400 (2.03)	600 (3.04)	800 (4.06)	
No Heat Sink		1.5	16.5	14.0	12.0	10.5	9.5

Note 2.

Intel 80486		486 Data Sheets (commercial only)					208-Lead SQFP (3.3V)				
		Voltage (3.0-3.6V)	Icc Spec. (mA/MHz)	Frequency (MHz)	Total Icc (mA)	Power (Watts)	Case Temp. (degrees C)	Theta JC (deg. C/Watt)	Junction Temp.(C)	Theta JA (deg. C/Watt)	Ambient Temp.(C)
DX2	Typ.	3.3	Thermal	50	395.0	1.30	85	3.5	89.6	24.0	58.3
	Max.	3.3	Thermal	50	507.0	1.67	85	3.5	90.9	24.0	50.7
	Max.	3.6	Thermal	50	507.0	1.83	85	3.5	91.4	24.0	47.6
DX4	Typ.	3.3	Thermal	100	1075.0	3.55	85	1.2	89.3	12.5	44.9
	Max.	3.3	Thermal	100	1300.0	4.29	85	1.2	90.1	12.5	36.5
	Max.	3.6	Thermal	100	1300.0	4.68	85	1.2	90.6	12.5	32.1

Note 3.

Note 4.

- Note:**
- 1.) All data shown are based on No Airflow and No Heat Sink
  - 2.) Theta JA thermal resistance with Airflow is based on an average of measured values.
  - 3.) Table 28 on page 45 in the Intel DX2 data sheet (Oct. 1995) lists Max. Ambient of 51 degrees for the 208-Lead SQFP (3.3V) without a Heat Sink and with Zero Airflow.
  - 4.) Table 26 on page 44 in the Intel DX4 data sheet (Oct. 1995) lists Max. Ambient of 36.5 degrees for the 208-Lead SQFP (3.3V) without a Heat Sink and with Zero Airflow.