

### DRAM Data

	Prototype	1st	2nd	3rd	4th	Pin
4MB	75.5	66.5	57.5	48.4	39.4	20
16MB	126.7	115.5	104.2	93.0	N/A	26
64MB	221.7	193.4	165.0	N/A	N/A	34
256MB	361.1	324.0	N/A	N/A	N/A	40
1024MB	590.0	N/A	N/A	N/A	N/A	46

### Change in Transistor Density

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Percentage
4MB	75.5	67.7	60.7	54.5	48.9	43.8	39.3	35.3	31.6	28.4	25.5	22.8	20.5	0.103
16MB		126.7	114.3	103.1	93.0	83.9	75.7	68.2	61.5	55.5	50.1	45.2	40.7	0.098
64MB				221.7	200.9	182.0	164.9	149.4	135.3	122.6	111.1	100.6	91.2	0.094
256MB						361.1	323.9	290.5	260.6	233.8	209.7	188.1	168.7	0.103
													Mean	0.099

### Change in Transistor Density using Sequential Change

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Percentage
4MB	75.5	69.5	63.5	57.5	51.4	45.4	39.4	33.4	27.4	21.4	15.3	9.3	3.3	0.044
16MB		126.7	115.5	104.2	93.0	81.8	70.5	59.3	48.1	36.8	25.6	14.4	3.1	0.025
64MB				221.7	202.8	183.9	165.0	146.1	127.2	108.3	89.4	70.5	51.6	0.233
256MB						361.1	324.0	286.9	249.8	212.7	175.6	138.5	101.4	0.281

### CPU Die Proportional

CPU	Transistors	88	89	90	91	92	93	94	95	96	97	98	99	2000
MIPS R3000	125,000	72	64.8	58.4	52.6	47.4	42.7	38.4	34.6	31.2	28.1	25.3	22.8	20.5
80486DX25	1,200,000	82	73.9	66.5	59.9	54.0	48.6	43.8	39.4	35.5	32.0	28.8	25.9	23.4
80486DX33	1,200,000	160	144.1	129.8	116.9	105.3	94.8	85.4	76.9	69.3	62.4	56.2	50.6	45.6
80486DX50	1,200,000	160	144.1	129.8	116.9	105.3	94.8	85.4	76.9	69.3	62.4	56.2	50.6	45.6
Motorola 68040	1,200,000		126.4	113.8	102.5	92.3	83.2	74.9	67.5	60.8	54.7	49.3	44.4	40.0
MPC 601	2,800,000			118.8	107.0	96.4	86.8	78.2	70.4	63.4	57.1	51.4	46.3	41.7
MIPS R4000	1,300,000			165	148.6	133.8	120.5	108.6	97.8	88.1	79.3	71.4	64.3	57.9
MIPS R4400	2,300,000			184	165.7	149.3	134.4	121.1	109.0	98.2	88.4	79.7	71.7	64.6
MIPS R4400	2,300,000			186	167.5	150.9	135.9	122.4	110.2	99.3	89.4	80.5	72.5	65.3
HP7100	850,000			201.6	181.6	163.5	147.3	132.6	119.5	107.6	96.9	87.3	78.6	70.8
Alpha21064	1,680,000			233.5	210.3	189.4	170.6	153.6	138.4	124.6	112.2	101.1	91.0	82.0
MIPS R4200	1,400,000				76	68.4	61.6	55.5	50.0	45.0	40.6	36.5	32.9	29.6
MPC 603	2,800,000				85.1	76.6	69.0	62.2	56.0	50.4	45.4	40.9	36.8	33.2
Pentium 60	3,100,000				262.4	236.3	212.8	191.7	172.7	155.5	140.1	126.1	113.6	102.3
Pentium 66	3,100,000				294	264.8	238.5	214.8	193.4	174.2	156.9	141.3	127.3	114.6
Pentium 66	3,100,000				294	264.8	238.5	214.8	193.4	174.2	156.9	141.3	127.3	114.6
MPC 601	2,800,000					74	66.6	60.0	54.1	48.7	43.9	39.5	35.6	32.0
MPC 604	3,100,000					195.9	176.4	158.9	143.1	128.9	116.1	104.6	94.2	84.8
HP7100LC	800,000					196	176.5	159.0	143.2	129.0	116.2	104.6	94.2	84.9
HP7150	850,000					196	176.5	159.0	143.2	129.0	116.2	104.6	94.2	84.9
HP7200	1,260,000					210	189.1	170.3	153.4	138.2	124.4	112.1	100.9	90.9
MIPS R10000	5,900,000					298	268.4	241.7	217.7	196.1	176.6	159.1	143.2	129.0
MPC 620	6,900,000					311.2	280.3	252.4	227.4	204.8	184.4	166.1	149.6	134.7

### Transistor per mm<sup>2</sup> using percentage of DRAM change and Sequential DRAM change

CPU	T/A	2000	T/A (II)
MIPS R3000	6094	3.1	39720
80486DX25	51371	3.6	334812
80486DX33	26328	7.0	171591
80486DX50	26328	7.0	171591
Motorola 68040	30015	3.1	383888
MPC 601	67112		
MIPS R4000	22435		
MIPS R4400	35594		
MIPS R4400	35211		
HP7100	12006		
Alpha21064	20487		
MIPS R4200	47242	17.7	79146
MPC 603	84381	19.8	141366
Pentium 60	30298	61.1	50759
Pentium 66	27041	68.4	45303
Pentium 66	27041	68.4	45303
MPC 601	87397	20.8	134746
MPC 604	36551	55.0	56353
HP7100LC	9428	55.0	14535
HP7150	10017	55.0	15444
HP7200	13859	59.0	21367
MIPS R10000	45730	83.7	70506
MPC 620	51213	87.4	78959
	22134		109140

T/A = Transistors per mm<sup>2</sup>