<u>EE 143</u>: Microfabrication Technology <u>Lecture 3</u>: Materials I





• Much of today's progress is driven by a roadmap generated many years ago

Year	1999	2002	2005	2008	2011	2014
Feature size (nm)	180	130	100	70	50	35
Logic trans/cm ²	6.2M	18M	39M	84M	180M	390M
Cost/trans (mc)	1.735	.580	.255	.110	.049	.022
#pads/chip	1867	2553	3492	4776	6532	8935
Clock (MHz)	1250	2100	3500	6000	10000	16900
Chip size (mm ²)	340	430	520	620	750	900
Wiring levels	6-7	7	7-8	8-9	9	10
Power supply (V)	1.8	1.5	1.2	0.9	0.6	0.5
High-perf pow (W)	90	130	160	170	175	183

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Microprocessor Transistor Counts 1971-2011 & Moore's Law 18.Com 694001 2.600.000.000 Sile Core Xee 1,000,000,000 100.000.000 aon a ≤ XBKZ II curve shows transistor W/D K/B Transistor count 10,000,000 Por Frend Por rount doubling every two years 1,000,000 100,000 10,000 2,300 1971 1980 1990 2000 2011 Date of introduction



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