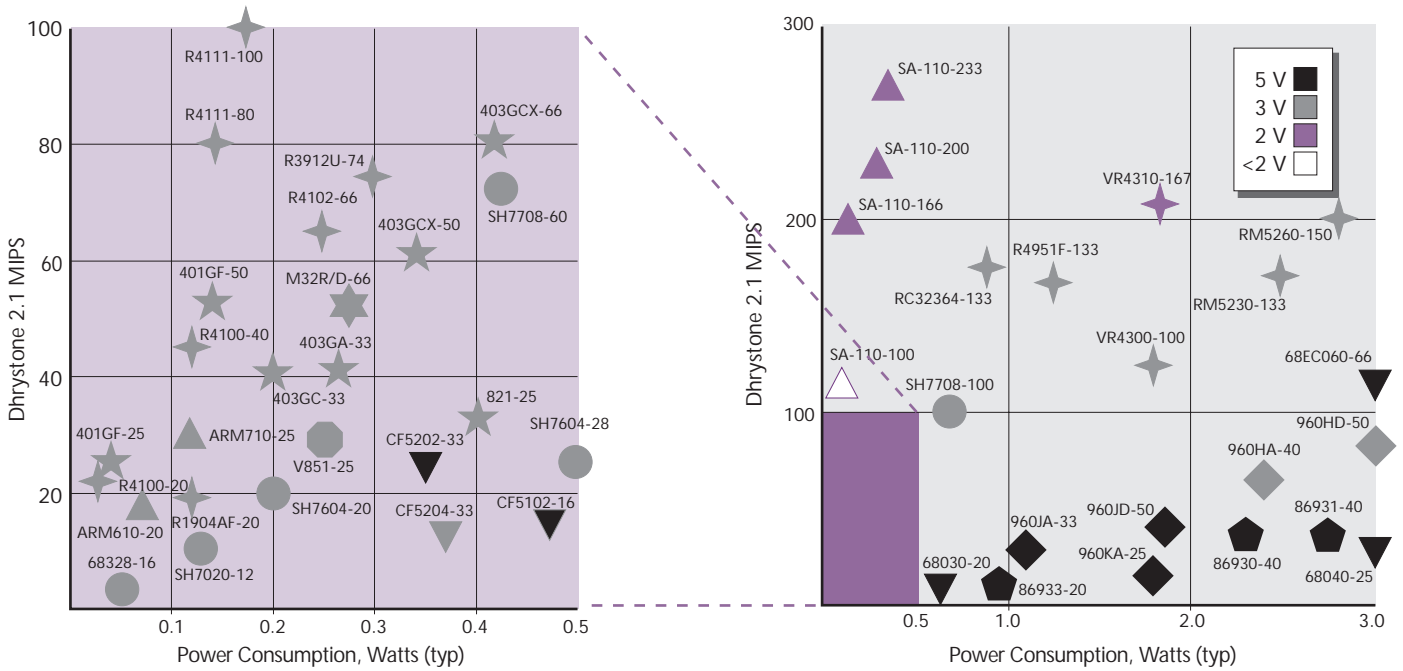
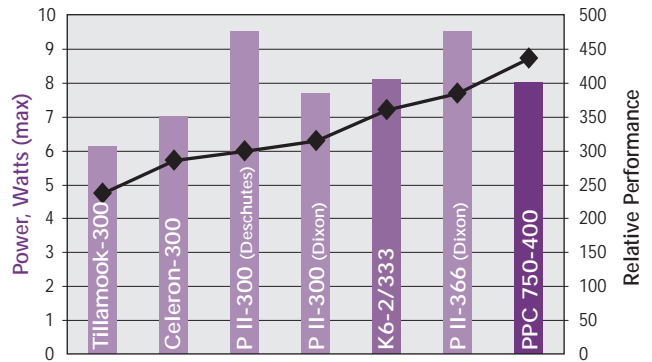


## CHART WATCH: MOBILE PROCESSORS



This Chart Watch covers low-power processors for portable and battery-powered systems. The table and the chart in the upper right show the performance/power ratio for a number of embedded CPUs and notebook processors; the chart above is an inset for those that consume the least power.

The chart on the right compares x86 and PowerPC processors for notebooks, including relative performance (diamonds) and maximum (TDP) power consumption (bars).



|                      | SA-110             | ARM710             | SH7708   | 401GF              | 403GX               | VR4121             | M32R/D              | CF5202             | V851               |
|----------------------|--------------------|--------------------|----------|--------------------|---------------------|--------------------|---------------------|--------------------|--------------------|
| Vendor               | Intel              | VLSI               | Hitachi  | IBM                | IBM                 | NEC                | Mitsubishi          | Motorola           | NEC                |
| Clock Rate           | 233 MHz            | 25 MHz             | 60 MHz   | 50 MHz             | 66 MHz              | 131 MHz            | 66 MHz              | 33 MHz             | 25 MHz             |
| I/D Cache            | 16K/16K            | 8K                 | 8K       | 2K/1K              | 16K/8K              | 16K/8K             | 4K                  | 2K                 | None               |
| FPU?                 | No                 | No                 | No       | No                 | No                  | No                 | No                  | No                 | None               |
| MMU?                 | Yes                | Yes                | Yes      | No                 | Yes                 | Yes                | No                  | No                 | None               |
| Bus Width            | 32 bits            | 32 bits            | 32 bits  | 32 bits            | 32 bits             | 32 bits            | 16 bits             | 32 bits            | 32 bits            |
| Bus Frequency        | 66 MHz             | 25 MHz             | 60 MHz   | 25 MHz             | 33 MHz              | 66 MHz             | 16 MHz              | 33 MHz             | 25 MHz             |
| MIPS                 | 268 MIPS           | 30 MIPS            | 72 MIPS  | 52 MIPS            | 81 MIPS             | 174 MIPS           | 52 MIPS             | 25 MIPS            | 29 MIPS            |
| Voltage†             | 2.0/3.3 V          | 3.3 V              | 3.3 V    | 3.3 V              | 3.3 V               | 2.5/3.3 V          | 3.3 V               | 5 V                | 3.3 V              |
| Power (typ)          | 360 mW             | 120 mW             | 420 mW   | 140 mW             | 420 mW              | 300 mW             | 275 mW              | 348 mW             | 250 mW             |
| MIPS/Watt            | 745                | 250                | 171      | 371                | 194                 | 580                | 189                 | 72                 | 116                |
| MIPS/mm <sup>2</sup> | 5.4                | 0.75               | n/a      | 2.36               | 1.35*               | 4.14               | 0.34                | 0.76*              | 0.69               |
| Transistors          | 2,100,000          | 341,000            | 800,000  | 345,000            | 1,820,000           | n/a                | 7,000,000           | n/a                | n/a                |
| IC Process           | 0.35µ 3M           | 0.8µ 2M            | 0.35µ 3M | 0.5µ 3M            | 0.5µ 3M             | 0.25µ 3M           | 0.42µ 2M            | 0.65µ 3M           | 0.8µ 2M            |
| Die Size             | 50 mm <sup>2</sup> | 40 mm <sup>2</sup> | n/a      | 22 mm <sup>2</sup> | 60* mm <sup>2</sup> | 42 mm <sup>2</sup> | 154 mm <sup>2</sup> | 33 mm <sup>2</sup> | 42 mm <sup>2</sup> |
| Est Mfg Cost*        | \$18               | \$9                | n/a      | \$4                | \$14                | \$14               | \$65                | \$4                | \$14               |
| Availability         | Now                | Now                | Now      | Now                | Now                 | Now                | Now                 | Now                | Now                |
| Price (10K)          | \$31.60            | \$30               | \$13.50  | \$6.50             | \$17.10             | \$25               | \$80                | \$8.11             | \$19               |

†core/bus voltage

n/a: information not available

(Source: vendors, except \*MDR estimates)