

CHART WATCH: EMBEDDED PROCESSORS

Feature	AMCC PPC 440GX	Broadcom BCM1250	Cavium Octeon NSP	IBM PPC 750GX	Freescale MPC7448	Freescale MPC8560	PMC-Sierra RM9000x2GL
Architecture	PowerPC (Book E)	SiByte MIPS64	MIPS64-R2 (cnMIPS64)	PowerPC G3	PowerPC e600 (G4+)	PowerPC e500 PowerQuicc III	Enhanced MIPS64
CPU Cores	1	2	1-16	1	1	1	2
Core Freq (MHz)	533-800	600-1,000	300-600	733-1,100	600-1,700	667-1,000	800-1,000
DRAM Bus Freq	166MHz	Up to 400MHz	Up to 800MHz	Up to 200MHz	133-200MHz	333MHz	200MHz
L1 Cache (I/D)	32K/32K	32K/32K	32K/8K	32K/32K	32K/32K	32K/32K	16K/16K
L2 Cache	256K	512K	Up to 1MB	1MB	1MB	256K	256K per CPU
FPU	—	Yes	—	Yes	Yes	Yes	Yes
ALU Pipeline	7 stages	9 stages	5 stages	4 stages	7 stages	7 stages	7 stages
Superscalar	2-way	4-way	2-way	2-way	4-way	2-way	2-way
Special Features	GbE, TCP/IP h/w, PCI-X, I ² O msg	3xGbE, PCI, HyperT, PCI, 2xDDR	SPI-4.2, RGMII, security, TOE, reg-ex engines	L2 cache locking, deep bus pipelining	AltiVec, new voltage/freq scaling	RapidIO, 2xGbE, PCI-X, DDR-333, MMU, Book E	HyperT, GbE, PCI, DDR, SysAD
Voltage (core)	1.5V	1.2V	1.0-1.2V	1.45V	1.0-1.3V*	1.2V	1.2V
Power (typical)	4.5W (533MHz)	8W-10W (800MHz)	5W-25W (worst-case)	8.8W (1.0GHz)	<10W* (1.4-1.5GHz)	7.5W (600MHz)	<12W
IC Process	0.13µm	0.13µm	0.13µm	0.13µm SOI	90nm SOI	0.13µm	0.13µm (LV)
Package	CBGA-552	BGA-860	709-1,500 pins	CBGA-292	BGA/LGA-360	FCBGA-733	672-896 pins
Production Availability	Now	Now	Now	Now	Now	Now	Now
Price (10K)	\$62 (533MHz)	\$300-\$400	\$20-\$750	\$105 (1K) (1.0GHz)	\$47-\$332	\$104-\$140	\$321 (800MHz)

* vendor estimate

This Chart Watch includes a variety of high-performance embedded processors representing a wide range of performance and pricing characteristics. The top chart includes the standard features and specifications, while the lower chart represents the processor's performance characteristics based on EEMBC benchmarks. The top part of the EEMBC chart contains the high-level marks associated with each application area (i.e. Consumer, Networking); the lower part of the EEMBC chart contains some of the individual benchmark scores. For more processor comparisons (and an explanation of out-of-the-box and full-fury), see www.eembc.org.

Benchmark Test	AMCC 440GX 667MHz	IBM 970FX 2.0GHz	Freescale MPC7448 1.7GHz	PMC-Sierra RM-7000C 625MHz	Texas Instruments TMS320C6416 1.0GHz	Transmeta Efficeon 1.0GHz
TeleMark	15.3	56.1	50.4 (601.4)	13.0	27.1 (873.1)	17.4
NetMark 1.1	15.0	63.3	55.2 (159.4)	16.3	—	20.3
ConsumerMark	57.9	284.5	251.5	48.7	—	109.0
OAMark	719.8	1,844	2,163	740	—	816
AutoMark	356.4	2,109	1,884	427.6	—	645
Telecomm Benchmark Suite						
Auto-Correlation (Sp)	8,472	25,354	39,191 (154,640)	8,008	57,061 (250,875)	6,263
Convol Encoder-3	25,007	146,156	45,291 (24,198,767)	11,088	19,320 (10,305,815)	17,688
Bit Allocation-3	46,114	202,675	144,887 (165,448)	27,000	56,805 (378,925)	56,457
FFT (Pulse)	18,677	55,095	67,281 (357,187)	19,540	34,202 (765,468)	28,297
Viterbi GSM Decode-1	3,351	8,525	10,722 (134,619)	3,797	4,109 (224,410)	4,582
Networking 2.0 Benchmark Suite						
TCPmark	—	1,357	1,097	—	—	407
IPmark	—	434	390	—	—	171
Digital Entertainment (DENbench) Suite						
DENmark	—	385	351 (762)	—	—	137
MPEG DecodeMark	—	2,022	2,051 (3,525)	—	—	732
MPEG EncodeMark	—	1,887	1,654 (4,979)	—	—	511
CryptoMark	—	1,497	1,534 (3,820)	—	—	593
ImageMark	—	2,765	2,396 (5,159)	—	—	1,041
Office Automation Benchmark Suite						
Dithering	400	1,026	1,302	395	—	504
Image Rotation	1,529	3,851	4,585	1,476	—	1,721
Text Processing	901	2,344	2,504	1,027	—	925

Numbers in parentheses are "full-fury" optimized scores. Other numbers are unoptimized "out-of-the-box" scores.