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Motorola M68000 Family Upward Compatible 16-/32-Bit Microprocessors

MC68020, 32-Bit HCMOS Microprocessor

The 020 has a full 32-bit internal and 32-bit external, regular, symmetrical architecture. It offers all the functionality of the M68000 Family MPUs and maintains software user-code compatibility. The unique on-chip instruction cache helps provide burst-mode operation to 12.5 MIPS. The 020 is the proven leader in high performance systems in office

automation, engineering workstations, fault tolerant computers, parallel processors, telephone switching systems, and intelligent controllers.

Mfr.'s Type	Operating Frequency (MHz)	MIPS	MFLOPS	Address Range (Bytes)	Data Bus (Bit)	Instruction Cache (Bytes)	Data Cache (Bytes)	Burst Mode	General Purpose Registers	Address Modes	On-Chip MMU	Floating Point Solution
114 Lead PGA (Gold Lead)												
MC68020RC16E	16	5.5	0.25	4 G	32	256	N/A	N/A	16	18	No	68882
MC68020RC20E	20	5.5	0.25	4 G	32	256	N/A	N/A	16	18	No	68882
MC68020RC25E	25	5.5	0.25	4 G	32	256	N/A	N/A	16	18	No	68882
MC68020RC33E	33	5.5	0.25	4 G	32	256	N/A	N/A	16	18	No	68882

MC68030, Second Generation 32-Bit HCMOS Microprocessor

The 030 contains two independent 32-bit address buses and two 32-bit data buses which allows the CPU, caches, MMU, and the bus controller to operate in parallel. This makes it possible for the 030 to simultaneously access an

instruction from the instruction cache, data from the data cache and instruction/data from external memory. Performance is further enhanced by on-chip 256 byte instruction and data caches, on-chip MMU, and enhanced bus controller.

Mfr.'s Type	Operating Frequency (MHz)	MIPS	MFLOPS	Address Range (Bytes)	Data Bus (Bit)	Instruction Cache (Bytes)	Data Cache (Bytes)	Burst Mode	General Purpose Registers	Address Modes	On-Chip MMU	Floating Point Solution
132 Lead CQFP (Gull Wing)												
128 Lead PGA (Gold Lead)												
MC68030RC20C	20	12	0.5	4 G	32	256	256	16 Byte R	16	18	Yes	68882
MC68030RC25C	25	12	0.5	4 G	32	256	256	16 Byte R	16	18	Yes	68882
MC68030RC33C	33	12	0.5	4 G	32	256	256	16 Byte R	16	18	Yes	68882
MC68030RC40C	40	12	0.5	4 G	32	256	256	16 Byte R	16	18	Yes	68882
MC68030RC50C	50	12	0.5	4 G	32	256	256	16 Byte R	16	18	Yes	68882

MC68040, Third Generation 32-Bit HCMOS Microprocessor

The 040 is a virtual memory microprocessor employing multiple, concurrent execution units and a highly integrated architecture. On a single chip, the 040 integrates a MC68030 compatible integer unit, an IEEE 754 compatible floating point unit (FPU) and fully independent instruction and data demand-paged memory units (MMUs), including independent 4 K-byte

instruction and data caches. A high degree of parallelism is achieved through use of multiple independent execution pipelines, multiple internal buses, and a full Harvard architecture, including separate physical caches for instruction and data accesses. The 040 also directly supports cache coherency in multimaster applications with dedicated on-chip bus snooping logic.

Mfr.'s Type	Operating Frequency (MHz)	MIPS	MFLOPS	Address Range (Bytes)	Data Bus (Bit)	Instruction Cache (Bytes)	Data Cache (Bytes)	Burst Mode	General Purpose Registers	Address Modes	On-Chip MMU	Floating Point Solution
184 Lead CQFP (Gull Wing)												
179 Lead PGA (Gold Lead)												
MC68040FE25	25	35	3.5	4 G	32	4 K	4 K	16 Byte R/W	16	18	Yes*	On-Chip

*Separate Instruction/Data.

MC68LC040

The MC68LC040 is a compatible integer unit and MMU. It is the ideal solution for cost sensitive computer or sophisticated embedded applications.

MC68LC040FE25	MC68LC040RC25A	25	27	N/A	4 G	32	4 K	4 K	16 Byte R/W	16	18	Yes	No
MC68LC040FE33	MC68LC040RC33	33	36	N/A	4 G	32	4 K	4 K	16 Byte R/W	16	18	Yes	No

MC68882, Enhanced Floating Point Coprocessor

The MC68882 is pin-to-pin hardware and software compatible with the MC68881 Floating Point Coprocessor and implements a variety of performance enhancements including dual-ported registers and an advanced pipeline. Additional

enhancements allows execution of multiple instructions in parallel for 2-4 times the Floating Point performance of the MC68881.

Mfr.'s Type	Operating Frequency (MHz)	Mfr.'s Type	Operating Frequency (MHz)
68 Lead PGA (Gold Lead)		68 Lead PGA (Gold Lead)	
MC68882RC25A	25	MC68882RC33A	33

High Performance 68 K Embedded Controllers

MC68EC040, 32-Bit High Performance Embedded Controller

High performance 32-bit MPU with on-chip instruction and data cache provides high speed access for control routines and data. The EC040 utilizes a low cost DRAM bus interface and also supports multimaster/multiprocessor systems with bus snooping.

Mfr.'s Type	Operating Frequency (MHz)	MIPS	Address Range (Bytes)	Instruction Cache (Bytes)	Data Cache (Bytes)	Burst Fill Caches (Bytes)	General Purpose Registers	Address Modes	Floating Point Hardware
184 Lead CQFP (Gull Wing)									
179 Lead PGA (Gold Lead)									
MC68EC040FE25A	25	27	4 G	4 K	4 K	16	16	18	68040
MC68EC040FE33	33	36	4 G	4 K	4 K	16	16	18	68040

High Performance 68 K Integrated Processors

MC68306, Integrated 68EC00 Processor

The 68306 includes a 68EC000 core processor, a 68681 Dual Universal Asynchronous Receiver Transmitter (DUART), system integration functions and a DRAM controller. The on-chip DRAM controller gives the 68306 the simplest interface

to DRAM based designs. The DRAM controller easily accommodates 64 Mbytes of memory. The 68306 saves time in the design cycle by providing valuable 68000 system components in one chip.

Mfr.'s Type	Operating Frequency (MHz)	Core Processor	DMA	Serial Processor	Time Processor Unit	Flash EEPROM	Serial I/O	Timers	A/D Converter	SRAM	DRAM Controller	Glue Logic (SIM)
132 Lead PQ (Gull Wing)												
144 Lead TQFP												
MC68306FC16B	16	68EC000	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes	Yes
MC68306PV16B	16	68EC000	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes	Yes

MC68340, Integrated Multiprotocol Processor with DMA

The 68340 features a CPU32 core and a high speed two channel, 32-bit Direct Memory Access (DMA) controller that eliminates the usual bus arbitration and synchronization delays, maximizing data throughput (25-Mbytes per second on a

16-bit bus. It also contains a SIM, a 68681/2681 compatible DUART, two identical counters/timers each with a 16-bit counter and an 8-bit prescaler with 80 ns resolution.

Mfr.'s Type	Operating Frequency (MHz)	Core Processor	DMA	Serial Processor	Time Processor Unit	Flash EEPROM	Serial I/O	Timers	A/D Converter	SRAM	DRAM Controller	Glue Logic (SIM)
144 Lead CQFP (Gull Wing)												
MC68340FE16E	16	CPU32	Yes	N/A	N/A	N/A	Yes	2	N/A	N/A	N/A	Yes
MC68340FE25E	25	CPU32	Yes	N/A	N/A	N/A	Yes	2	N/A	N/A	N/A	Yes

*3.3 Volt Version.

13

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