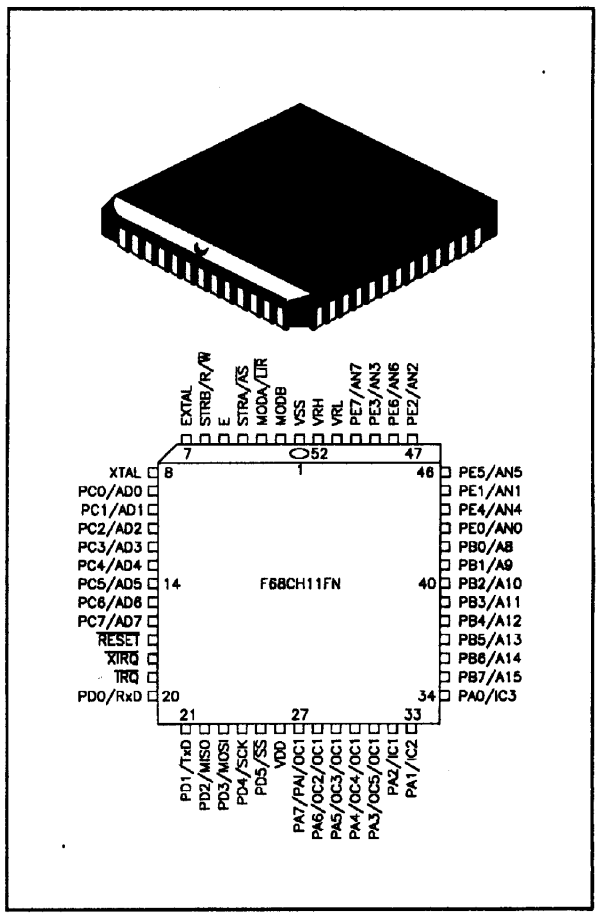
F68HC11 SINGLE-CHIP COMPUTER

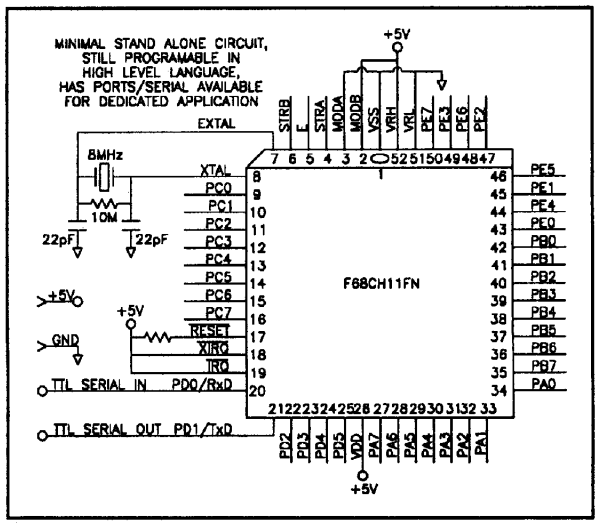
The F68HC11 FN V3.3 is a complete computer-on-a-chip. It has Max-FORTH Operating System and High Level Language (HLL) development tools included in the on-board ROM. The F68HC11 can be programmed in HLL with no additional support chips.

FEATURES

- Processor: MOTOROLA 68HC11, Enhanced 6800/6801
- Max-FORTH™ built-in programming language
  A superset of the Forth-83 Standard including:
  231 predefined words in the language
  The 83 Standard Word Set
  The 83 Standard Double Number Extension Word Set
  The 83 Standard System Extension Word Set
  All the 83 Standard Controlled Reference Words
  Single-Chip System Extensions
- 5 parallel ports
  one port of 6 configurable lines (some multiplexed w/serial)
  one port of 8 input lines (multiplexed with A/D converter)
  one port of 8 output lines
  one port of 8 configurable lines
  one port with 1 configurable, 3 input and 4 output lines
- 1 Asynchronous Serial Channel (UART)
  Enhanced NRZ Serial Communications Interface (SCI)
  8 or 9 bits with selectable baud rates:
  75, 150, 300, 600, 1200, 2400, 4800 or 9600 baud
  (default: 9600 baud, 8 data, no parity, 1 stop)
- 1 Synchronous Serial Channel (USART)
  Serial Peripheral Interface (SPI)
- Analog-to-Digital Converter
  8-bit, 8-channel
  Ratiometric with VRL and VRH inputs
  32 clock cycle conversion time per channel
- 8-bit Pulse Accumulator (event counting mode)
- COP Watchdog Timer & Clock Monitor
- 16-bit timer subsystem with:
  4-stage programmable prescaler
  Real Time Interrupt circuit
  3 input captures
  5 output compares
- Memory:
  Internal 1/2K EEPROM
  Internal 1/4K RAM
  Internal 8K ROM (with Max-Forth™ installed)
  Optional external 64K address space Memory expansion
- Interrupts:
  15 maskable interrupts (IRQ)
  2 non-maskable interrupts (SWI & XIRQ)
- Power:
  10 mA typical (15 max)at 5V, 8 Mhz, non expanded mode
  20 mA typical (27 max)at 5V, 8 Mhz, expanded bus mode
  5mA typical (6mA max) in WAIT mode
  1.7uA typical (10uA max) in STOP mode.

In minimum configuration, the F68HC11, with a simple crystal circuit (a crystal, a resistor, and two capacitors), needs only 5 V power, ground and TTL serial-in/serial-out connections to operate interactively.





Application

F68HC11 V3.3 HLL-SINGLE CHIP COMPUTER

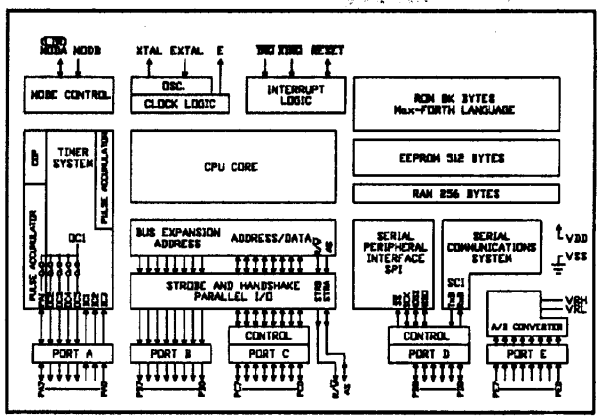
DESCRIPTION

This high speed, low power, CMOS computer-on-a-chip is packaged in a 52 pin PLCC (measuring 0.75" on a side). The chip hosts five, user available, 8-bit parallel ports in the single chip mode. There are three when expanded to have a 64K address and data bus. The asynchronous Serial Communications Interface (SCI) supports the system terminal. The second serial channel, the synchronous Serial Peripheral Interface (SPI), is uncommitted and available to the user. Also included are: a timer subsystem, a computer operating properly (watchdog) circuit, a fast 8-bit 8-channel A/D converter, and the 1/2K bytes of internal EEPROM.

The built-in High Level Language and Operating System, based on the FORTH-83 Standard, interactively gives easy machine access to the user. The vocabulary contains 231 words. Building on that base, applications can be very compact, some entirely resident on-chip.

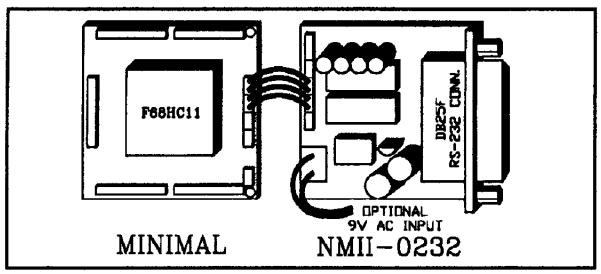
Although internal RAM is limited, non trivial applications can be programmed by defining words in RAM, then moving them to EEPROM, using the built-in EEPROM support functions. This frees the RAM to accept other words. The chip can be used in expanded mode, with programs developed in the 64K external address space, to meet the needs of larger application.

The built-in HLL gives advantages to the hardware designer, as well as the programmer. Direct communication with the chip allows rapid high level debugging of a new design. Immediate check out can begin, even if only the chip, its crystal circuit and power are working correctly.



F68HC11 CPU Block Diagram

To download code to the F68HC11's processor, or interactively develop code with terminals, or personal computers having RS-232 ports, a level shifter must be used to convert the TTL serial in and serial out to RS-232 levels. This can be easily accomplished by using a low-cost, readily available NMII-0232 TTL-to-RS-232 Converter board. Refer to the figure below.



RS232 Conversion

F68HC11

WORLD HEADQUARTERS WORLDWIDE REPRESENTATIVES

AMERICA (N,C & S)	*CENTRAL EUROPE*	*SOUTHERN EUROPE*	*SCANDINAVIA*	*ASIA*	*RUSSIA*
NEW MICROS, INC. Sales Department 1601 Chalk Hill Road Dallas, TX 75212, USA Phone: (214) 339-2204 Fax: (214) 339-1585 G3, G2, FMG1 User Bulletin Board: (214) 339-2321 24/12, N, 8, 1	MS Microscan Vertriebs GmbH Ueberseering 23 2000 Hamburg 60 GERMANY Phone: 040 / 6 32 32 14 Fax: 040 / 6 32 37 10	DEMEL G. Demel Handelsges, m.b.H. Hoffmeistergasse 8-10/1/4, A-1120 Vienna, AUSTRIA Phone: (0043) 0222 813 2507-0 Fax: (0043) 0222 85 95 93 Telex: 75311851	FIELD OY ELECTRONIIKKARYHMA P O Box 131 SF 00601 Helsinki, FINLAND Phone: 358 0 757 1011 Fax: 358 079 8853 Telex: 12-2022 FIELD SF	CIBI TRADING INT'L 20 Matimtiman Street Teacher's Village, Diliman Quezon City, PHILIPPINES Phone: (632) 922-2988 Fax: (632) 921-8027	TECHNOFORTH 59, Bolshoi Pr., P.S., Leningrad, 197101, USSR Phone: (812) 233-86-21 (812) 233-34-10 Fax: (812) 233-86-21

NEW MICROS, INC.
1601 Chalk Hill Road
Dallas, Texas 75212
Tel: (214)-339-2204