SIEMENS

C161RI
Consumer Class
16-bit Microcontroller

Microcontrollers

A choice of basic peripherals plus I²C bus interface are joined for a highly benefit in consumer products. The real time clock together with power saving modes extends the possibilities of use while the application is in standby.
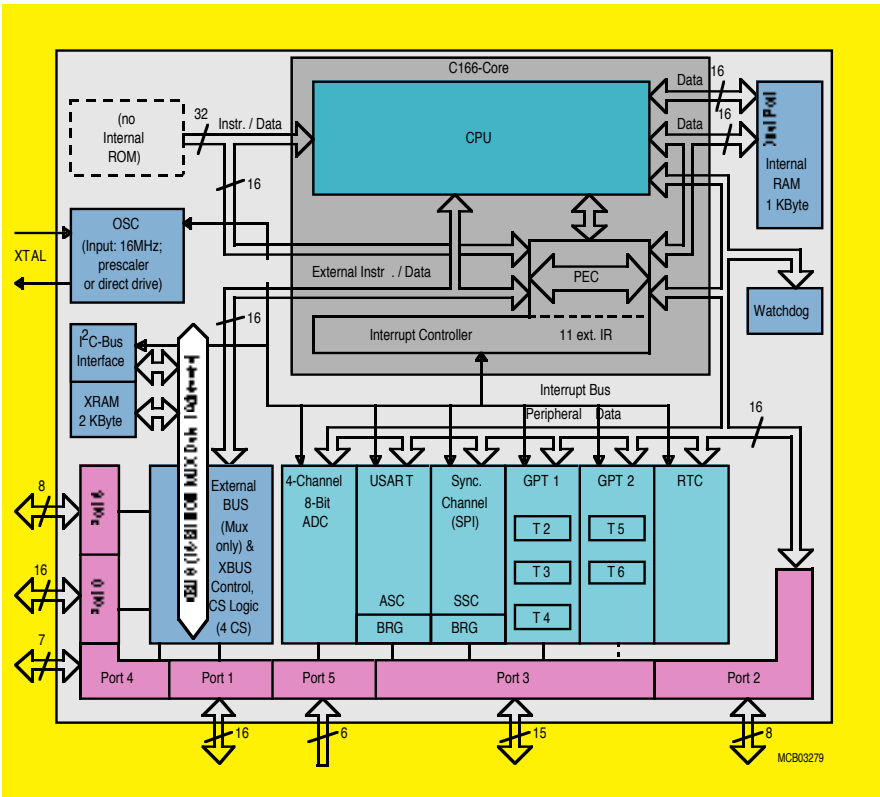
This member of C166 family offers whole capability of a full size 16-bit microcontroller at a low cost price.

- High Performance 16-bit CPU with 4-stage pipeline
- 125 ns Instruction Cycle Time at 16 MHz CPU Clock
- 625 ns Multiplication (16 x 16 bit) 1.25 μs Division (32 / 16 bit)
- Clock Generation via Prescaler or via Direct Clock Input
- Enhanced Boolean Bit Manipulation Facilities
- Additional Instructions to Support HLL and Operating Systems
- Register-Based Design with Multiple Variable Register Banks
- Single-Cycle Context Switching Support
- Up to 8 MBytes Linear Address Space for Code and Data
- 3 KBytes On-Chip RAM

- Programmable External Bus Characteristics for Different Address Ranges
- 8-bit or 16-bit External Data Bus
- Multiplexed or Demultiplexed External Address / Data Bus
- 5 Programmable Chip-Select Signals
- 1024 Bytes On-Chip Special Function Register Area
- Enhanced Power saving Modes
- 8-Channel Interrupt-Driven Single-Cycle Data Transfer Facilities via Peripheral Event Controller (PEC)
- 16-Priority-Level Interrupt System, 11 External Interrupts
- 4-channel 8-bit A/D Converter
- Real Time clock
- I²C Bus Interface (10-bit Addressing, 400 kHz) with 2 Channels (multiplexed)
- Multi-Functional General Purpose Timer Units with up to five 16-bit Timers

- Two Serial Channels [Synchronous / Asynchronous (USART) and High-Speed-Synchronous]
- Programmable Watchdog Timer
- Up to 76 General Purpose I/O Lines
- 3V Operation (max. CPU clock 12 MHz) without ADC
- Supported by a large Range of Development Tools including C-Compilers, Makro-Assembler Packages, Real-Time Operating Systems, Emulators, Evaluation Boards, HLL-Debuggers, Simulators, Logic Analyzers Disassemblers, Programming Boards
- On-Chip Bootstrap Loader
- 100-Pin MQFP/TQFP-Package

For complete device designations (corresponding to PRO ELECTRON) please refer to the data sheet

C161RI
Block Diagram

C166-Core
CPU
(no Internal ROM)
32 Instr. / Data
16
Data 16
Data 16
Dual Port
Internal RAM 1 KByte
OSC (Input: 16MHz; prescaler or direct drive)
XTAL
External Instr. / Data
PEC
Interrupt Controller   11 ext. IR
Watchdog
I²C-Bus Interface
XRAM 2 KByte
Interrupt Bus
Peripheral Data
16
External BUS (Mux only) & XBUS Control, CS Logic (4 CS)
4-Channel 8-Bit ADC
USART
Sync. Channel (SPI)
GPT 1
T 2
T 3
T 4
GPT 2
T 5
T 6
RTC
ASC
SSC
BRG
BRG
8
16
7
Port 4   Port 1   Port 5   Port 3   Port 2
16   6   15   8

MCB03279

C161RI
Pin Configuration
Square TQFP-100
Package (top view)

C161RI

Pin	Left
1	P5.14 / T4EUD
2	P5.15 / T2EUD
3	Vss
4	XTAL1
5	XTAL2
6	Vcc
7	P3.0 / SCL0
8	P3.1 / SDA0
9	P3.2 / CAPIN
10	P3.3 / T3OUT
11	P3.4 / T3EUD
12	P3.5 / T4IN
13	P3.6 / T3IN
14	P3.7 / T2IN
15	P3.8 / MRST
16	P3.9 / MTSR
17	P3.10 / TxD0
18	P3.11 / RxD0
19	P3.12 / BHE / WRH
20	P3.13 / SCLK
21	P3.15 / CLKOUT
22	Vss
23	Vcc
24	P4.0 / A16
25	P4.1 / A17

Pin	Right
75	Vcc
74	Vss
73	P1H.7 / A15
72	P1H.6 / A14
71	P1H.5 / A13
70	P1H.4 / A12
69	P1H.3 / A11
68	P1H.2 / A10
67	P1H.1 / A9
66	P1H.0 / A8
65	Vcc
64	Vss
63	P1L7 / A7
62	P1L6 / A6
62	P1L5. / A5
60	P1L.4 / A4
59	P1L.3 / A3
58	P1L.2 / A2
57	P1L.1 / A1
56	P1L.0 / A0
55	P0H.7 / AD15
54	P0H.6 / AD14
53	P0H.5 / AD13
52	P0H.4 / AD12
51	P0H.3 / AD11

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