

## 32-bit RISC MCU with 2 MB Flash Memory for Real-Time Control with DSP Functionality

### Highlights

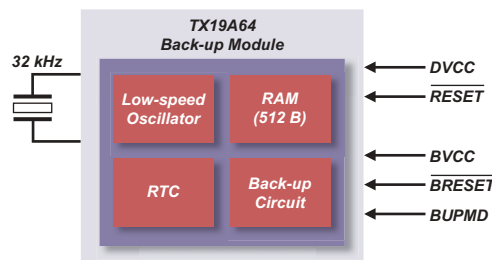
- High performance:
  - 32-bit MIPS RISC core
  - Fast MAC unit 32 x 32 + 64-bit in one clock cycle
- Fast Interrupt Response
  - Special Interrupt Controller with full hardware processing
- NANO FLASH™
  - Combines advantages of NAND and NOR Flash technology. Fast write/erase cycles (e.g. <2 sec for 512 KB), industrial temperature range, low-power consumption
- Code Efficiency
  - MIPS16e™–TX RISC, 16 & 32-bit Instruction set
  - Advanced instruction set: Bit Operation, Type Conversion Saving/Recovery of Multiple Registers
- Low-Power
  - e.g. Back-up module: 5 µA @ 2.7V, running RTC and maintaining RAM

### Description

The TMP19A64 is a 32-bit RISC microcontroller based on the TX19A core and containing 2 MB of NANO FLASH™, a large number of external Interrupts and timer/counters. The microcontroller features low-voltage and low-power consumption, making it ideal for battery-powered applications, such as portable information equipment, metering and security systems.

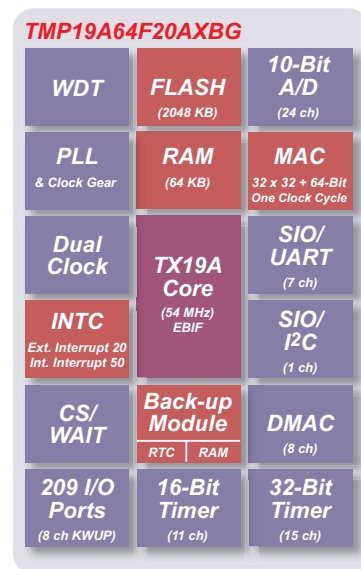
### Features

- CPU: 32-bit MIPS TX19A RISC core, 54 MHz
  - Up to 2 MB Flash/64 KB RAM Flash and Mask Rom available
  - Two instruction sets:
    1. The 16-bit ISA instruction is compatible with MIPS16e–TX for high code efficiency
    2. The 32-bit ISA instruction is compatible with the high-performance TX39
    3. Single clock cycle execution
  - Five-stage pipeline
  - On-chip, high-speed memory
  - Clock generator and on-chip PLL (x4)
  - Sub clock (32.768 kHz)
- MAC unit for DSP function
  - 32 x 32 + 64-bit in a single clock
- Low-power consumption
  - Optimized design using a low-power cell library
  - Programmable standby modes in which processor clocks are stopped
  - 8-channel DMA controller
  - Back-up module:



- Interrupts:
  - External: 20, Internal: 50
- Timer
  - 11 channel x 16-bit timer
  - 15 channel x 32-bit timer
  - Real-Time Clock Timer (RTC)
  - Watchdog Timer (WDT)
- Serial Communication
  - 7 channel x UART/SIO
  - 1 channel x I2C
- 24 channel x 10-bit A/D converter
  - Conversion time 8.44 msec
- I/Os 209 pins
- Operating voltage
  - Core 1.35 V – 1.65 V
  - I/O and ADC 1.65 V – 3.3 V
  - ADC 2.7 V – 3.3V
- Package
  - P-FBGA 281 (13 mm x 13 mm, 0.65 mm pitch)

### Diagram



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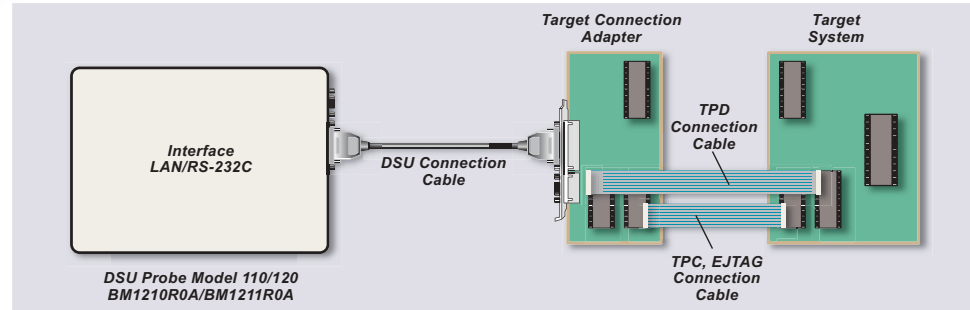
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## Development Tool Support

- Minimum five pins for debugging
- Real-time PC trace is available, data trace is available

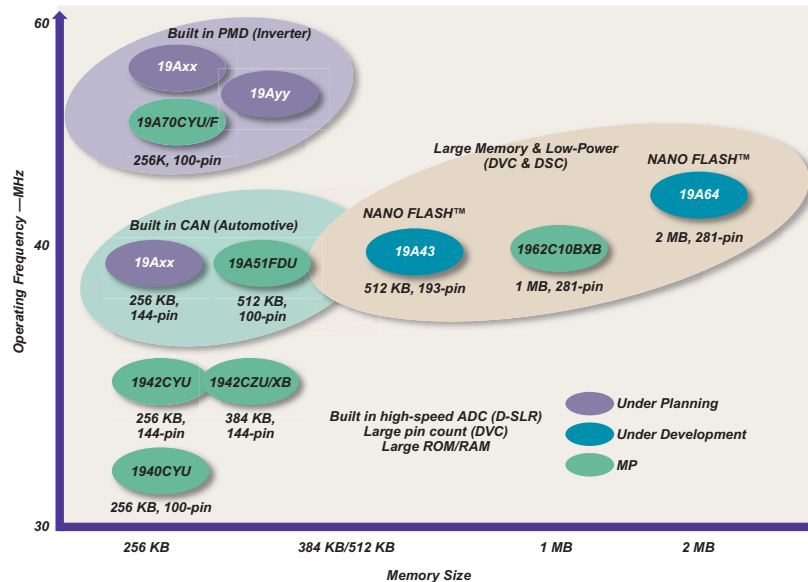
- Memory reference and write/erase can be executed during program operation
- Write to Flash ROM on the MCU is possible

## System Configuration



Item	Order Number
C-Compiler	SW1ACN0-ZCC
Build Manager, Debugger and Simulator set	SW1AMN0-ZCC
DSU Probe: Model 110, 4k frame , PC address	BM1210R0A
DSU Probe: Model 120, 128k frame , PC address/Data	BM1211R0A

## Product Line-up



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