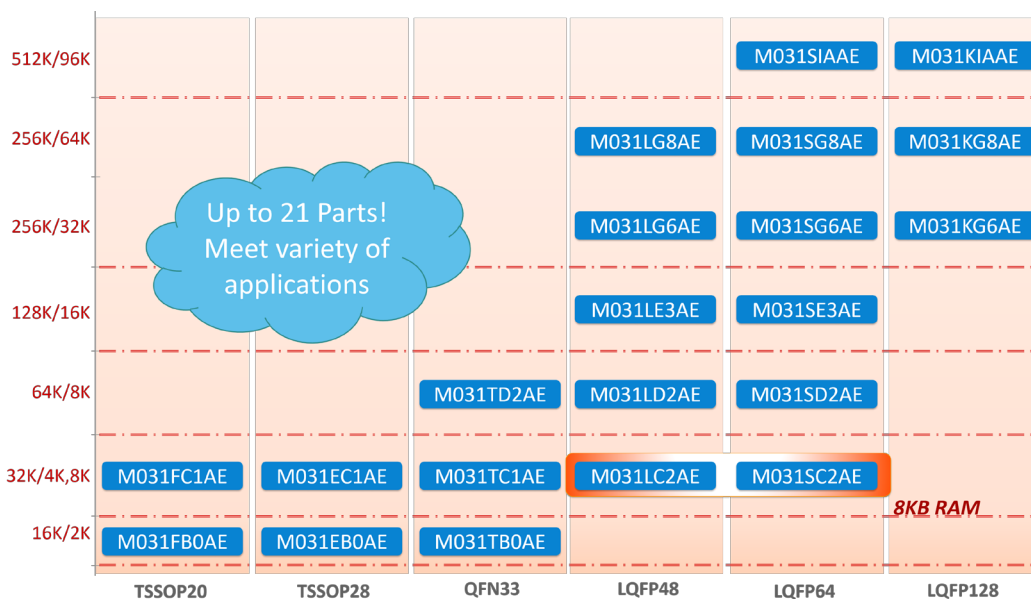# Low-Cost Cortex-M0 MCUs

Nuvoton's M031 series features a 32bit Cortex-M0 microcontroller. This series has an even wider supply voltage range than before and comes with more peripherals. It features an interface connection with enhanced fast 2 MSPS conversion rate 12-bit ADC, comparators and up-to 24-ch 96/144 MHz PWM control, providing a fast and precise data conversion for the voltage, current, and sensor data, then fast response control to the external device.

The M031 series peripherals included Universal Serial Control Interface (USCI) can be set as UART / SPI / I²C flexibly, up to 10 sets of UART, 4 sets of SPI, 4 set I²C, 1-wire UART interface for data communication between master and slave devices.

All new M031 series products support the following advanced features:

- Support single-wire UART half-duplex mode with bit rate up to 6 Mbps
- Support UART (9600 bps) in power-down mode by Internal 38.4 kHz LIRC. Collaborate with 16byte FIFO to support wake-up function (receiving up to 15 bytes in power-down mode)
- Support High-speed SPI (1.8V~3.6V) with 4x32 byte FIFO & Tx / Rx PDMA function (Master mode 24MHz/ Slave mode 16MHz)
- PWM input clock source can be from PLL (frequency up to 96/144 MHz). PWM frequency can be up to 375 kHz (at 96 MHz clock source). PWM supports capture mode & PDMA. Pulse count value can be directly stored into SRAM using PDMA function. Support to measure the minimum pulse width down to 0.5 us.

	TSSOP20	TSSOP28	QFN33	LQFP48	LQFP64	LQFP128
512K/96K					M031SIAAE	M031KIAAE
256K/64K				M031LG8AE	M031SG8AE	M031KG8AE
256K/32K				M031LG6AE	M031SG6AE	M031KG6AE
128K/16K				M031LE3AE	M031SE3AE	
64K/8K			M031TD2AE	M031LD2AE	M031SD2AE	
32K/4K,8K	M031FC1AE	M031EC1AE	M031TC1AE	M031LC2AE	M031SC2AE	
16K/2K	M031FB0AE	M031EB0AE	M031TB0AE			

Up to 21 Parts! Meet variety of applications

8KB RAM

Supported packages from small form factor TSSOP20, TSSOP28, QFN33, LQFP48 to LQFP 64 and LQFP128 with pin-compatible for different part number makes the system design and change parts easy. Each package has different Flash/SRAM options.

Key Features of the M031 series:

- Arm® Cortex® -M0, CPU speed up to 72MHz
- 1.8V to 3.6V operating voltage
- 180 uA/MHz in normal run mode
- Flash memory from 16K to 512K
- SRAM from 2K to 96K
- Operating temperature: -40°C to 105°C
- 20-128 pin packages

Applications:

- **Industrial Control**
- **High precision meter**
- **Wireless charger**
- **HMI**
- **IoT**