



MICROCHIP PIC16F1827

> MICROCHIP PIC12F1822

nanovatt XLP Technology MICROCHIP

PIC24FJ64GB004



www.microchip.com/XLP

Products with nanoWatt XLP **Technology** offer the industry's **lowest currents** for Run and Sleep, where extreme low power applications **spend 90-99%** of their time.



Looking Beyond Low Power MCUs

Microchip has introduced nanoWatt XLP eXtreme Low Power Technology to address the needs of your next product. Benefits include:

- Sleep currents below 20 nA
- Brown-out Reset down to 45 nA
- Watch-dog Timer down to 220 nA
- Real-time Clock/Calendar down to 470 nA
- Run currents down to 50 µA/MHz
- Full analog and self-write capability down to 1.8V

Low Power Peripheral Integration

Today's low power products require integrated advanced peripherals. nanoWatt XLP MCUs are available with:

- USB Connectivity
- LCD Controllers
- Hardware RTCC
- mTouchTM Capacitive Touch Sensing

Low Power Safety

Reliability is a primary concern for battery powered products. Integrated low power supervisory circuit

- Brown-out Reset guards against low batteries, power loss
- Watchdog Timer with on-chip clock source for dependable operation
- Real Time Clock/Calendar for precise time keeping

Low Power Design Support

Full support for your extreme low power design:

- Global Sales and Technical Support (24/7)
- Regional Training Centers
- Low Cost Development Tools
- Free MPLAB® IDE and C Compiler
- Free software stacks: USB, mTouch, ZigBee®,
- On-line Design Center: www.microchip.com/XLP

Example XLP PIC® MCUs

Device		Flash Memory (KB)	Pins	Sleep (nA)	WDT* (nA)	RTC* (nA)	1 MHz Run (μA)
PIC16LF182X	CAP SENSE	3.5-7	8-28	20	300	600	50
PIC16LF72X	CAP SENSE	3.5-14	28/44	20	500	600	110
PIC16LF193X	CAP SENSE	7-28	28/44	60	500	600	150
PIC18LF1XK50	CAP SENSE USB	8-16	20	24	450	790	170
PIC18LF14K22	CAP SENSE	8-16	20	34	460	650	150
PIC18LF4XK22	CAP SENSE	8-64	28/44	50	600	500	250
PIC18F46J11	CAP SENSE	16-64	28/44	13	813	813	272
PIC18F46J50	CAP SENSE USB	16-64	28/44	13	813	813	272
PIC18F87K90	CAP SENSE	32-128	64/80	25	350	720	181
PIC24F04KA201	CAP SENSE	4	14/20	20	370	470	195
PIC24F16KA102	CAP SENSE	8-16	20/28	20	420	520	195
PIC24FJ64GB004	CAP SENSE	32-64	28/44	20	220	520	250

^{*}Base sleep current included in WDT and/or RTC numbers. Typical I/O pin leakage current ±5 nA. All numbers are typical values at minimum VDD, taken from the data sheet.

75 PRODUCTS **Broad Low-Power Product Offering**

Example Applications Battery

- Consumer
- Utility Metering
- Asset Tracking
- Electronic Locks
- Portable Medical
- Smoke/CO₂ Detectors
- Irrigation Systems
- Security Systems/ Sensors
- Remote Keyless Entry

Green Initiatives

- Compliance with Regulations
- Appliances
- Home Electronics

Energy Harvesting

- Wireless Switches
- Battery-free Sensors
- Wireless Sensor Networks
- RF Powered Sensors

XLP 16-bit Development Board (DM240311)



Designed with eXtreme Low Power in mind, this board enables development with the PIC24F family of 16-bit PIC XLP MCUs.

Functionality

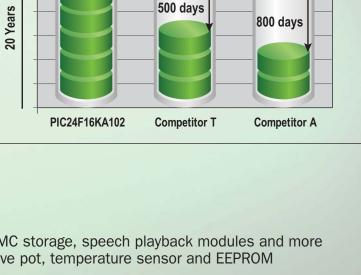
PIC16LF19XX

PIC16LF72X

PIC16LF18XX

8-bit

- Supports 20-/28-pin devices
- Flexible power options
- CR2032 coin cell
- -2xAAA lithium** or alkaline cells
- Energy harvesting: solar, vibration, RF, etc.
- External/USB
- Easy Prototyping:
 - PICtail™ connector supports RF Modules, SD/MMC storage, speech playback modules and more
- LEDs, capacitive and mechanical buttons, resistive pot, temperature sensor and EEPROM
- Generic prototyping area
- USB communication to PC



Battery Life

nanoWatt XLP vs. Competition

(RTCC on, Run 1 ms/min., CR2032 Lithium Button Cell Battery)

PIC18F8XK90

PIC18F8XK22

PIC18F4XJ50

PIC18F4XJ11

PIC18LF1XK50

PIC18LF1XK22

8-bit

Performance

PIC18LF4XK22 mTouck

PIC18LF4XK20 mTouch

LCD

PIC24FJ64GB00X

PIC24FJ64GA10X

PIC24F16KA10X

PIC24F04KA20X

16-bit



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^{**} Microchip recommends Energizer® Ultimate Lithium AAA Batteries for the XLP 16-bit Development Board.