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Propeller P2X8C4M64P (P2) Multicore Microcontroller Spec Sheet

The Propeller P2X8C4M64P (P2) is a multicore microcontroller with the performance of an MPU, excelling at real-time analog and digital applications. Designed to help engineers achieve the fastest time to market, the P2's highly flexible, deterministic hardware and development environment are free from the complication, expense and lead time associated with traditional FPGA-type development cycles.

The P2 has 8 identical 32-bit processors each with 4 KB of dual-port RAM, a configurable clock up to 320 MHz (8x160 MIPs), 64 smart I/O pins, and a common hub with 512 KB of shared RAM and a CORDIC math solver.

Each of the 64 smart I/Os can be accessed by every cog, and are independently able to execute hundreds of autonomous analog and digital functions. Each Smart Pin can support almost any protocol, with a growing list of objects including 1-WIRE, CANbus, DVI, HDMI, HDTV, HUB75, HyperFlash/RAM, I²C, QSPI/QSSI, RS485, SCI/SPI, SID, SD CARD, UART/USART, USB 2.0 HOST/SLAVE, VGA, XBEE. (For R&D only; end users must seek their own protocol licenses where needed.)

External Flash or a removable SD card memory can be used to boot or store program code and data, which allows for simple product deployment, on-site updates and efficient, low-cost support.

For complete Propeller 2 specifications, documentation, development kits and boards, programming tools, developers' forum, and other community resources, visit www.parallax.com/p2.

Selected Specifications

- Eight 32-bit cores each with 4 KB dual-port RAM
- 512 KB shared RAM
- 64 identical Smart I/O pins
- Power core @ 1.8 VDC, I/O pins @ 3.3 VDC
- Internal ~20 MHz and ~20 kHz RC oscillators
- Low-power operation mode @ ~130 μ A
- External clock input with internal loading caps
- Fractional PLL, 3 stage
- Frequency 180 MHz typical, 320 MHz extended
- Hub access speed 720 MB/s/cog @180 MHz
- Max execution @ 180 MHz 720 MIPs (90 MIPs/cog)

Physical Characteristics

- Package: 14x14 mm exposed-pad 100-pin TQFP
- Operating temperature range: -40 to +105°C
- Moisture Sensitivity Level (MSL) 3 (168 hours)

Compliance

- RoHS3 Compliant (EU 2011/65/EU)
- REACH Compliant (EU EC 1907/2006)
- ECCN 3A991A2 (EU EAR99)
- HTSUS 8542.31.0001

Hardware Function Highlights

- ADC: 64 x 14-bit
- ADC Modes: Delta-Sigma, SINC1/2/3, Scope
- Atomic Locks: 16 locks accessible by all cogs
- Comparator modes with feedback
- CORDIC math solver: 54 stage, 8 function
- Counter Modes: 28 per cog & 64-bit hub global
- Clock Modes: Six 32-bit
- DAC: 64 x 16-bit, 3 ns 75 ohm
- Debug interrupt: single-stepping & breakpoint
- Digital input filter
- Drive modes: 1.5k, 15k, 150k, 1mA, 100 μ A, 10 μ A
- Event & timer modes: 16 per cog
- Goertzel analysis: 4 ADC bit streams per cog
- Interrupts: 3 per cog, 16 event sources
- Math: SIN, LOG, TAN, ARC
- PWM: Triangle, Sawtooth, SMPS
- Quadrature Decoder
- USB 12 Mbps
- Analog Video: VGA/HDTV/NTSC/PAL
- Digital Video: HDMI 480p @60fps, 720p @24fps
- Xoroshiro128 (PRNG, noise-seeded)