

# MSP430F55xx/56xx/66xx: ULP with Full-Speed USB 2.0



## MSP430™ MCUs + USB

The MSP430 MCU portfolio has been expanded to include a variety of devices integrated with USB, ideal for applications such as analog and digital sensor systems, data loggers, and other solutions that require connectivity via USB. With integrated USB MSP430 MCU products, along with its intuitive evaluation tools and software, designers are prepared to implement USB in their projects!

### Some of the MSP430F55xx/56xx/66xx features are:

- Integrated USB connectivity
- Ultra-low power (five low-power modes)
- Multiple small package options (as small as 5 × 5 mm)
- Analog integration
  - 10-/12-bit ADC, DAC, comparator, DMA, 160-segmented LCD driver, USCI (I<sup>2</sup>C, SPI, UART, IrDA), enhanced 32 × 32 multiplier
- Increased performance
  - Up to 25 MHz
  - 8 to 256 KB flash (no external programming voltage needed)
- Up to 16 KB RAM
- Four 16-bit timers, RTC
- Increased functionality
  - Wide supply voltage range, 1.8 to 3.6 V
  - In-system programming as low as 1.8 V
  - Read during erase operation
- New power management module (PMM)
  - Advanced capabilities to the user
  - Real-time clock with supply voltage backup switch
  - Integrated low-power voltage regulator (LDO)
  - Programmable dual-supply voltage management and supervision (SVM/SVS)
  - Dual power domains
  - Adjustable core voltage for power optimization
- Increased ease of use
  - Fail-safe and flexible clocking system (0, one or two external clock sources)
  - Fail-safe flash timing
  - User-defined boot-strap loader (BSL)
  - Integrated voltage reference
- Ease of migration

### USB features

- Full-speed USB device at 12 Mbps
- Supports control, interrupt and bulk transfers
- Eight input/eight output endpoints
- Integrated 3.3-V LDO for direct operation from 5-V VBUS
- Integrated D+ pull-up
- Integrated transceiver
- Timestamp generator capable of 62.5-ns resolution

### Tools and support

#### USB BSL

- Supports end-user firmware updates and fast production programming
- Visual Studio project for fast development

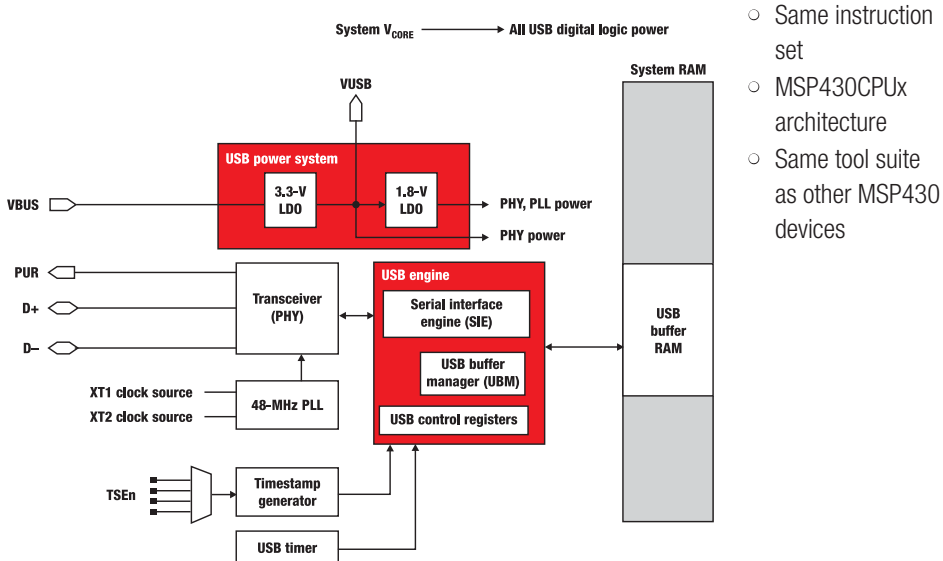
#### Descriptor tool

- Automatically generates USB descriptor code
- Configures stack functions with an easy interface

#### Software tool chain (CCS and IAR)

#### Software stacks for quick development

- Communication device class (CDC)
- Human interface device (HID)
- Mass storage class (MSC)
- Others from third-party partners
- **Socketed target board** for in-system programming/debug via JTAG or Spy-Bi-Wire (two-wire JTAG)
  - MSP-TS430RGC64USB
  - MSP-TS430PN80USB
  - MSP-TS430PZ100USB



- Same instruction set
- MSP430CPUx architecture
- Same tool suite as other MSP430 devices

## MSP430F55xx/56xx/66xx: ULP with Full-Speed USB 2.0

Device	Program (KB)	SRAM (KB)	I/O	16-Bit		Watchdog and RTC	PMM (BOR, SVS, SVM, LDO)	USCI		DMA	MPY (32 × 32)	Comparator	Temp Sensor	ADC Ch/Res	Package(s)
				A	B			Ch A: UART/LIN/IrDA/SPI	Ch B: I <sup>2</sup> C/SPI						
<a href="#">MSP430F5500</a>	8	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	48 RGZ
<a href="#">MSP430F5501</a>	16	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	48 RGZ
<a href="#">MSP430F5502</a>	24	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	48 RGZ
<a href="#">MSP430F5503</a>	32	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	48 RGZ
<a href="#">MSP430F5504</a>	8	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8-ch ADC10	48 RGZ, 48 PT
<a href="#">MSP430F5505</a>	16	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8-ch ADC10	48 RGZ
<a href="#">MSP430F5506</a>	24	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8-ch ADC10	48 RGZ
<a href="#">MSP430F5507</a>	32	4 + 2*	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8-ch ADC10	48 RGZ
<a href="#">MSP430F5508</a>	16	4 + 2*	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC10	48 RGZ, 48 PT, 64 RGC, 80 ZQE
<a href="#">MSP430F5509</a>	24	4 + 2*	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC10	48 RGZ, 48 PT, 64 RGC, 80 ZQE
<a href="#">MSP430F5510</a>	32	4 + 2*	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC10	48 RGZ, 48 PT, 64 RGC, 80 ZQE
MSP430F5513	32	4 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	64 RGC, 80 ZQE
MSP430F5514	64	4 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	64 RGC, 80 ZQE
MSP430F5515	64	4 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	80 PN
MSP430F5517	96	6 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	80 PN
MSP430F5519	128	8 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	80 PN
MSP430F5521	32	6 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16-ch ADC12 A	80 PN
MSP430F5522	32	8 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC12 A	64 RGC, 80 ZQE
MSP430F5524	64	4 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC12 A	64 RGC, 80 ZQE
MSP430F5525	64	4 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16-ch ADC12 A	80 PN
MSP430F5526	96	6 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC12 A	64 RGC, 80 ZQE
MSP430F5527	96	6 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16-ch ADC12 A	80 PN
MSP430F5528	128	8 + 2*	48	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12-ch ADC12 A	64 RGC, 80 ZQE
MSP430F5529	128	8 + 2*	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16-ch ADC12 A	80 PN
<a href="#">MSP430F5630</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F5631</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F5632</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F5633</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F5634</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F5635</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F5636</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F5637</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F5638</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6630</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F6631</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F6632</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	–	–	100 PZ, 113 ZQW
<a href="#">MSP430F6633</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6634</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6635</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6636</a>	128	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6637</a>	192	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW
<a href="#">MSP430F6638</a>	256	16 + 2*	74	5,3,3	7	✓	✓	2	2	6 ch	✓	✓	✓	16-ch ADC12 A	100 PZ, 113 ZQW

\* Additional 2 K of SRAM available if USB is disabled.

Preview products are listed in **bold blue**.

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