

Match Made in Heaven: Analog and MSP432 MCU



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Microcontrollers and analog are each other's soul mates. Both rely on each other to complete the signal path in almost all applications— medical, consumer, energy etc. We need analog parts for signal processing and a processor for control, data storage and system communication. This can be done by using standalone analog or integrated analog inside the microcontroller.

What are the benefits of Integrated versus Standalone analog?



Integrated

- Simplified System Design
- BOM/PCB Size Reduction
- Potential Cost Savings
- Better System Level Power Consumption

Standalone

- Higher Performance
- Faster Conversion Rates/Settling Times
- More Device Options Available

MSP has been a leader in the low power microcontroller space, but it's the analog peripherals embedded on chip that help you achieve the desired power apart from reducing system cost and time to market. The integrated analog peripherals are designed to operate in the various power modes enabling a power-efficient system solution. Many of the analog peripherals have modes of operation that do not use the CPU at all, which enables low-power consumption and frees the CPU for parallel operations. The information below highlights the key features of each analog integrated peripheral and recommended device to begin evaluation.

| MSP™ MCU Family | ADC | | | | | DAC | Op Amp | Comp | Inputs & Outputs | | | Voltage Monitoring | USB PHY | |
|--------------------|------------|------------|------------|--------------------|--------------------|-----|--------|------|------------------|------|----|--------------------|---------|----------|
| | 10-Bit SAR | 12-Bit SAR | 14-Bit SAR | 16-Bit Sigma Delta | 24-Bit Sigma Delta | | | | Temp Sensor | 1.8v | 5v | | | CapTouch |
| MSP430F1x | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | | | ✓ | |
| MSP430F2x/F4x | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | |
| MSP430FRxx FRAM | ✓ | ✓ | | | | | | ✓ | ✓ | | | ✓ | ✓ | |
| MSP430G2x/I2x | ✓ | | | | ✓ | | | ✓ | ✓ | | | ✓ | ✓ | |
| MSP430F5x/F6x/FG6x | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| MSP432P4x | | | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | |

For more details on MSP's analog integration, benefits and applications visit the [analog integration](#) page.

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