

MSP430F677x

Ultra-Low Power Polyphase Energy Meter System on Chip



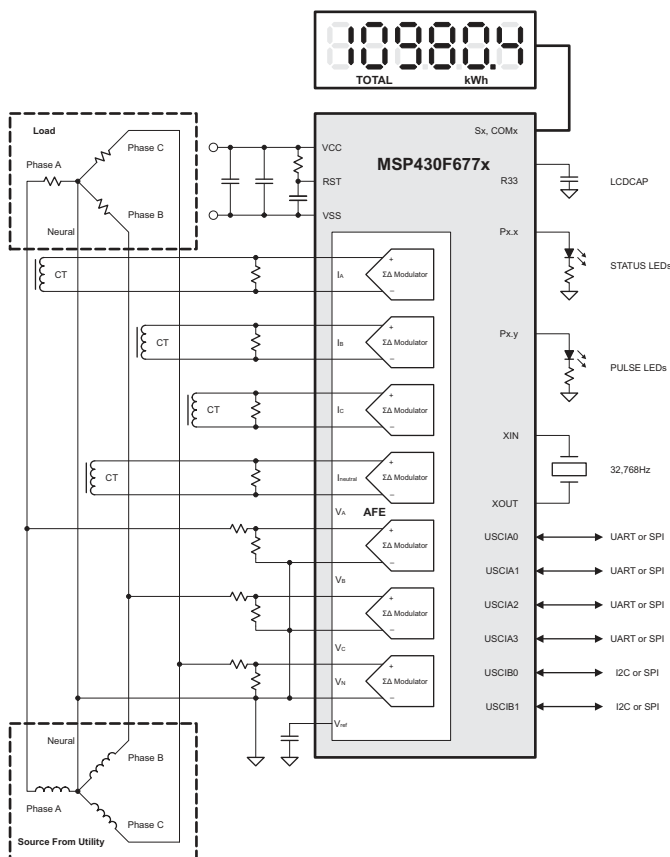
Key device features and benefits

Feature	Benefit
Seven 24-bit sigma delta analog-to-digital converters	Class-leading accuracy across a full 2000:1 input current range throughout -40°C to $+85^{\circ}\text{C}$
Up to 512kB Flash + 32kB SRAM	Dynamic pricing tables for time of use, large buffer for interval data, DLMS/COSEM for meter data formatting, and communication stacks for both wired and wireless protocols
Up to 4 UART, 6 SPI, 2 I ² C ports	Interface to communications devices to develop smart meters
Supports multiple LCD format up to 320 segments thanks to eight MUX	Can display Asian and custom characters for global deployment
Energy libraries in software	Performs all of the polyphase meter calculations for energy and power that are required for ANSI/IEC qualified meters and provides an easy starting point for customers developing utility meter products

The Texas Instruments MSP430F6779 is a highly integrated, high accuracy, ultra-low power metrology System on Chip (SoC) designed for smart polyphase electric metering applications.

Optimized for single-phase measurement with anti-tamper, the MSP430F6779 supports up to three independent 24-bit sigma-delta ($\Sigma\Delta$) Analog-to-Digital Converters (ADC) and achieves less than 0.1% error in energy accuracy over a wide dynamic range of 2000:1. In addition, the unique combination of six additional synchronized channels ADC10 give the user the flexibility to develop the lowest cost 2-phase or 3-phase E-meters.

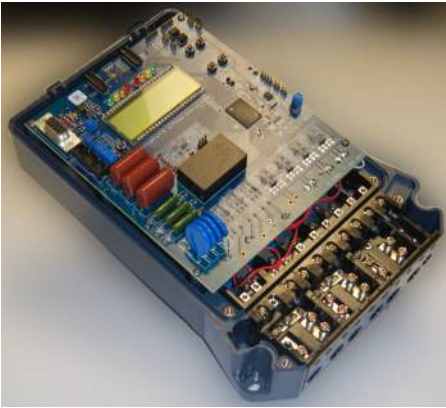
A comprehensive development tool set including hardware reference design and energy libraries in software enables quick development, time to market and certification.



▲ F6779 block diagram

Energy library features

- Polyphase energy measurement with support for anti-tamper
- Class 0.1% accuracy over a 2000:1 dynamic range
- Calibration and key parameters including
 - RMS current and voltage
 - Active, reactive and apparent power
 - Active, reactive and apparent energies
 - Independent pulse output for active and reactive energies
 - Power factor
 - Software phase compensation
 - Frequency
 - Temperature
 - Tamper detection



▲ EVM430-F6779 EVM

EVM key features

- Supports shunts/current transformers for current sensors
- Less than 0.1% error in accuracy for 2000:1 dynamic range
- Flexible and isolated sources for MSP430F6779
- 320 segment LCD display
- 32kHz RTC support
- Two LEDs and two headers for active energy and reactive energy pulses
- Support for anti-tamper detection
- PC communication to MSP430F6779 via RS-232
- Software installed for measuring metering parameters
- PC-based GUI for calibration/results via MSP430F6779
- JTAG connections for simultaneous debug

Relevant documents

- [MSP430F6779 datasheet](#)

Find out more about TI's MSP430F677x family by visiting the sites below:

- TI's smart grid solutions:
www.ti.com/smartgrid
- MSP430 energy library:
www.ti.com/tool/msp430-energy-library
- Smart Grid E2E™ community:
www.ti.com/smartgrid-blog

TI Worldwide Technical Support

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