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 (ΣΔ) 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.

**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

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**Key device features and benefits**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven 24-bit sigma delta analog-to-digital converters</td>
<td>Class-leading accuracy across a full 2000:1 input current range throughout –40°C to +85°C</td>
</tr>
<tr>
<td>Up to 512kB Flash + 32kB SRAM</td>
<td>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</td>
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<tr>
<td>Up to 4 UART, 6 SPI, 2 I²C ports</td>
<td>Interface to communications devices to develop smart meters</td>
</tr>
<tr>
<td>Supports multiple LCD format up to 320 segments thanks to eight MUX</td>
<td>Can display Asian and custom characters for global deployment</td>
</tr>
<tr>
<td>Energy libraries in software</td>
<td>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</td>
</tr>
</tbody>
</table>

**F6779 block diagram**

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*Image of a circuit diagram showing the MSP430F677x Ultra-Low Power Polyphase Energy Meter System on Chip.*
• 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

EVM key features

• Supports shunts/current transformers for current sensors

EVM430-F6779 EVM

TI Worldwide Technical Support

Internet
TI Semiconductor Product Information Center Home Page
support.ti.com
TI E2E™ Community Home Page
e2e.ti.com

Product Information Centers

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