

# ATM90Exx Metering Analog Front Ends

Out-of-the-Box Solutions for Basic Single- or Poly-Phase Metering Applications

## Summary

Devices in Microchip's M90Exx series are high-performance, wide-span hardware metrology chips. Their Analog-to-Digital Conversion (ADC) and Digital Signal Processing (DSP) technology ensure long-term stability over variations in grid and ambient environmental conditions. Their best-in-class dynamic range (up to 6000:1) will improve performance, reduce OEM's manufacturing costs and help achieve a higher score during certification.

The ATM90E26 is a high-performance energy metering device for single-phase two-wire, single-phase three-wire or anti-tampering active and reactive energy meters. Its measurement function enables the ATM90E26 to also be used in power instruments which need to measure voltage, current and other data. The ATM90E32AS and ATM90E36A are alternate solutions for use in three-phase four-wire (3P4W, Y0) or three-phase three-wire (3P3W, Y or  $\Delta$ ) systems. It can also be used in a data acquisition terminal. Its measurement and Fourier analysis functions enable the ATM90E36A to be used in power monitoring instruments which need to measure voltage, current, THD, DFT, mean power and other data.

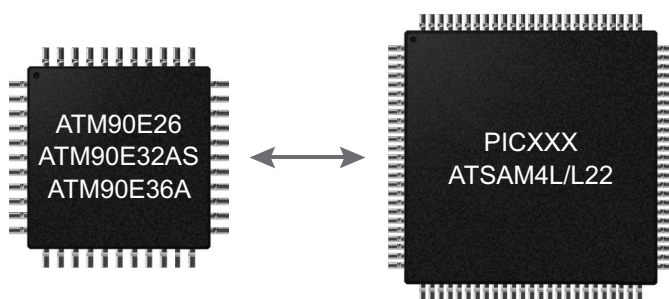
## Key Features

- Fully compliant with IEC62052-11, IEC62053-21, IEC62053-22 and IEC62053-23; ANSI C12.1 and ANSI C12.20
- Applicable to class 0.2S, 0.5S or class 1 poly-phase watt-hour meter or class 2 poly-phase var-hour meter
- Simplifies manufacturing (one metrology/sensor for all types)
- Reduces storage, installation and maintenance complexity
- Integrated DFT, THD analysis functions reduces BOM costs (ATM90E36A)
- Temperature coefficient is 6 ppm/°C (typical) for on-chip reference voltage (15 ppm/°C for ATM90E26)
- Electrical parameters measurement: less than  $\pm 0.5\%$  fiducial error for  $V_{RMS}$ ,  $I_{RMS}$ , mean active/reactive/apparent power, frequency, power factor and phase angle
- Standard four-wire/simplified three-wire SPI interface or UART interface (M90E26)

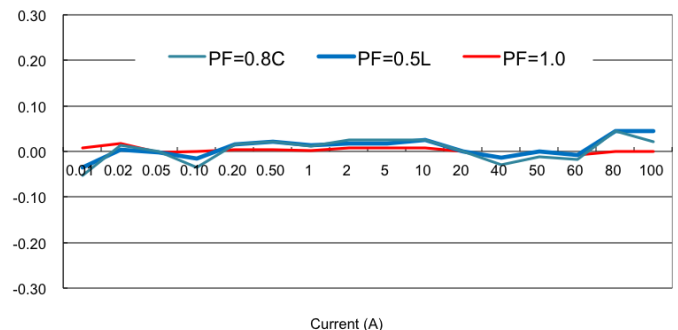
## Typical Applications

- Single-phase two-wire (1P2W), single-phase three-wire (1P3W) or anti-tampering energy meters
- Poly-phase energy meters of class 0.2S, 0.5S and class 1 which are used in three-phase four-wire (3P4W, Y0) or three-phase three-wire (3P3W, Y or  $\Delta$ ) systems
- Data acquisition terminal
- Power monitoring instruments which need to measure voltage, current, THD, DFT, mean power, etc.
- Smart plugs
- Street lighting

## Great Fit with ATSAM4LX/L22 or PIC® MCUs



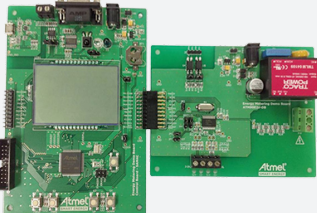
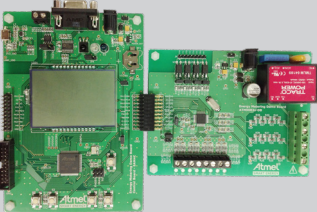
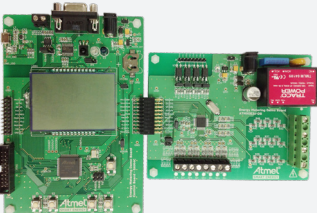
## Active Energy % Error



## Product Variants

Part Number	Package	Carrier Type	Operational Range	Service Type	Dynamic Range	Active Energy Accuracy	Reactive Energy Accuracy	Key Features
ATM90E26-YU-B	28-pin SSOP	Tube	Industrial (A) -40 to 85°C	1 ph	5000:1	0.1%	0.2%	AFE, active/reactive energy, measurement and anti-tamper
ATM90E26-YU-R	28-pin SSOP	Tape and Reel	Industrial (A) -40 to 85°C	1 ph	5000:1	0.1%	0.2%	AFE, active/reactive energy, measurement and anti-tamper
ATM90E32AS-AU-Y	48-pin TQFP	Tray	Industrial (A) -40 to 85°C	3 ph	6000:1	0.1%	0.2%	AFE, active/reactive energy, instantaneous, measurement, piece-wise compensation, event detection
ATM90E32AS-AU-R	48-pin TQFP	Tape and Reel	Industrial (A) -40 to 85°C	3 ph	6000:1	0.1%	0.2%	AFE, active/reactive energy, instantaneous, measurement, piece-wise compensation, event detection
ATM90E36A-AU-Y	48-pin TQFP	Tray	Industrial (A) -40 to 85°C	3 ph	6000:1	0.1%	0.2%	AFE, active/reactive energy, fundamental and harmonics measurement, Discrete Fourier Transform (DFT) function, raw data capture
ATM90E36A-AU-R	48-pin TQFP	Tape and Reel	Industrial (A) -40 to 85°C	3 ph	6000:1	0.1%	0.2%	AFE, active/reactive energy, fundamental and harmonics measurement, Discrete Fourier Transform (DFT) function, raw data capture

## Development Tools

	Ordering Information	Description
	<b>ATM90E2X-DB</b>	The ATM90E2X Single-Phase Energy Metering Demo Board (ATM90E2X-DB) is used for demonstrating and testing the ATM90E2X single-phase energy metering AFE chip, which can sample single-phase voltage and current, meter active/reactive energy and output active/reactive energy pulses, as well as measure parameters such as voltage, current and power. The AFE control board with a SAM4C MCU communicates with and controls the AFE board, providing easy evaluation of the energy metering chips.
	<b>ATM90E32AS-DB</b>	The ATM90E32AS Poly-Phase Energy Metering Demo Board (ATM90E32AS-DB) is used for demonstrating and testing the ATM90E32AS poly-phase energy metering AFE chip, which can sample poly-phase voltage and current, meter active/reactive/apparent/fundamental/harmonic energy and output these energy pulses accordingly, as well as measure parameters such as voltage, current and power.
	<b>ATM90E36A-DB</b>	The ATM90E36A Poly-Phase Energy Metering Demo Board (ATM90E36A-DB) is used for demonstrating and testing the ATM90E36A poly-phase energy metering AFE chip, which can sample poly-phase voltage and current, meter active/reactive/apparent/fundamental/harmonic energy and output these energy pulses accordingly, as well as measure parameters such as voltage, current and power.

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