

How solid is your solid-state energy meter?

Not all ICs are created equal

Did you know that the quality of an integrated circuit (IC) depends on the failure rate of the process it is manufactured from? Even if a device is fully functional, one made from a process with a high failure rate is more likely to experience a shorter operational life than one manufactured on a high quality process.

Analog Devices has a rigorous quality system to monitor the quality of its outgoing products. Figure 1 shows the electrical failure rate in parts per million (PPM). These rejected devices are identified as more likely to experience early failure in the field. People

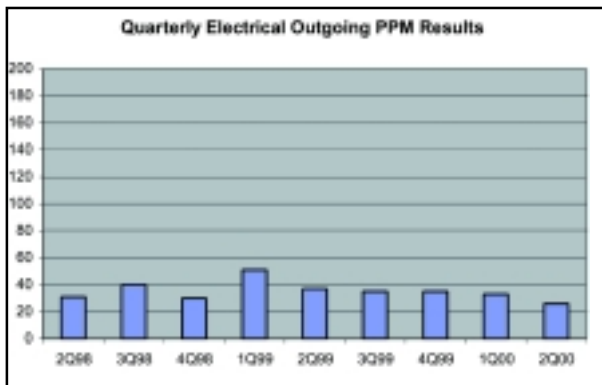


Fig 1: Quarterly electrical outgoing PPM results

familiar with the semiconductor industry would recognise them as marginal parametric rejects. The ultra-low failure rate ensures that Analog Devices' customers receive products with virtually zero defects and low probability of early failure in the field.

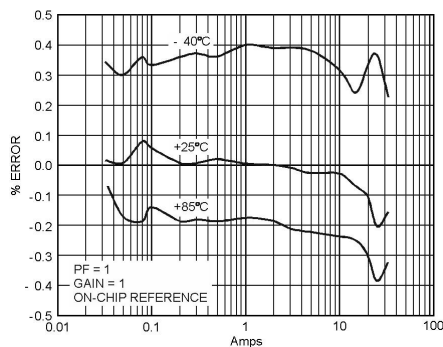


Fig 2: Accuracy of AD7755 over a 1000:1 dynamic range (unity power factor)

Analog Devices also has a state-of-the-art internal product analysis group working directly with customers on quality issues and providing rapid responses to customers through correlation, analysis and corrective actions.

For details on Analog Devices' quality system, and the latest electrical PPM results, visit the *Quality System* link on our web site at <http://www.analog.com/>.

PERFORMANCE

Analog Devices' AD775x family of energy metering ICs is the choice for many meter manufacturers around the world. AD775x family energy metering products provide unsurpassed accuracy of watt-hour calculation over a very wide dynamic range. Figure 2 and Figure 3 highlight the performance of AD7755, the core of the AD775x family, over a dynamic range of 1000:1 and temperature range of -40°C to 85°C . Even at low power factor (PF=0.5), as shown on the plots, AD7755 maintains its accuracy. Details of each metering product can be found in the energy metering group's home page at <http://www.analog.com/energymeter/>.

SIMPLE TO DESIGN AND MANUFACTURE

AD775x products are designed to make meter design and manufacturing as simple as possible. The circuitry needed for an AD775x based energy meter is very simple. Analog Devices' AD7755 IEC1036 Class 1 watt-hour meter reference design is shown in Figure 4. The full documentation of this meter, Application Note AN-559,

can be found on our web site. The reference design is provided to help customers shorten their design cycle. All AD775x products need only a single 5V voltage supply. AD7751

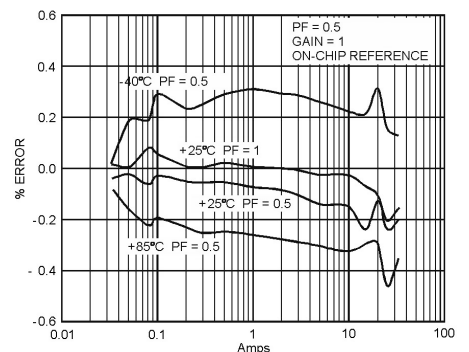


Fig 3: Accuracy of AD7755 over a 1000:1 dynamic range (at 0.5 power factor)

and AD7755 also provide direct drive capability to a mechanical counter.

Most AD775x products can also interface directly with very low resistance shunt. The simplicity in design enables a very short design-to-market cycle. For manufacturers, a simple design translates to a significant cost saving. The concept of simplicity is extended to a single calibration point, typically at I_b (basic current). Calibrating an AD775x based watt-hour meter can be done quickly and efficiently. ■

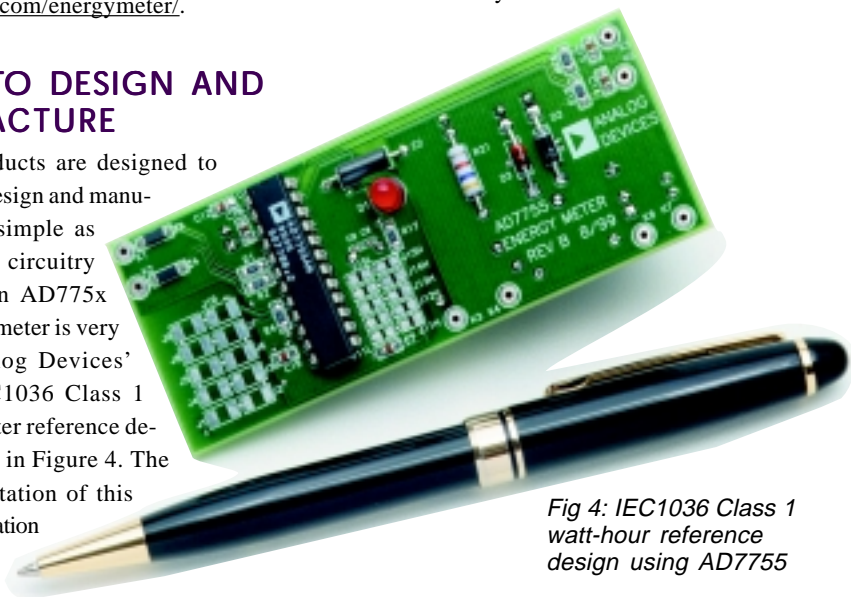


Fig 4: IEC1036 Class 1 watt-hour reference design using AD7755