TSMU818A030 8-Channel, 18-Bit, 30V, 100mA Output, High-Capacitive Drive Parametric Measurement Unit (PMU)

1 Features

- 8-channel 4-quadrant PMU
  - FV, FI, FZ (high-Z), MV, and MI functions
- Programmable current ranges
  - Internal ±5µA, ±40µA, ±200µA, ±2mA ranges
  - Up to ±100mA with external R_{SENSE}
- 30V FV span with asymmetrical range choices
- Stable operation with up to 10µF C_{LOAD}
- Channel independent DACs
  - 18-bit force DAC with multiple voltage ranges
  - 16-bit offset, and voltage clamp DACs
  - 15-bit current clamp DACs
- Offset error and gain error calibration with true 18-bit endpoint performance
- Dual configuration state digital architecture
- Fast current clamps

2 Applications

- Memory test
- Semiconductor test
- Source measurement units

3 Description

The TSMU818A030 is a high-performance, highly integrated parametric measurement unit (PMU) consisting of eight independent channels. Each channel includes one voltage output DAC that sets the programmable input levels for the force voltage amplifier and two clamp input DACs. Five resistor based programmable force and measure current ranges are available, ranging from ±5µA to ±100mA. Four of these ranges use on-chip sense resistors.

Measurements for the eight channels can be multiplexed in a wired-or configuration, which eliminates the need for an external multiplexer. Individual measurement outputs for respective channels are also available. The PMU functions are controlled using a simple SPI-compatible serial interface. Interface clock of 80MHz allows for fast mode updates and state changes with the dual-state double-buffered architecture. Configuration registers allow the user to easily change force or measure conditions, DAC levels, and selected current ranges.

Package Information

PART NUMBER	PACKAGE[1]	PACKAGE SIZE[2]
TSMU818A030	ACQ (FCBGA, 144)	16mm × 16mm
	AMO (FCBGA, 196)	20mm × 20mm

(1) For more information, see Section 6.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.
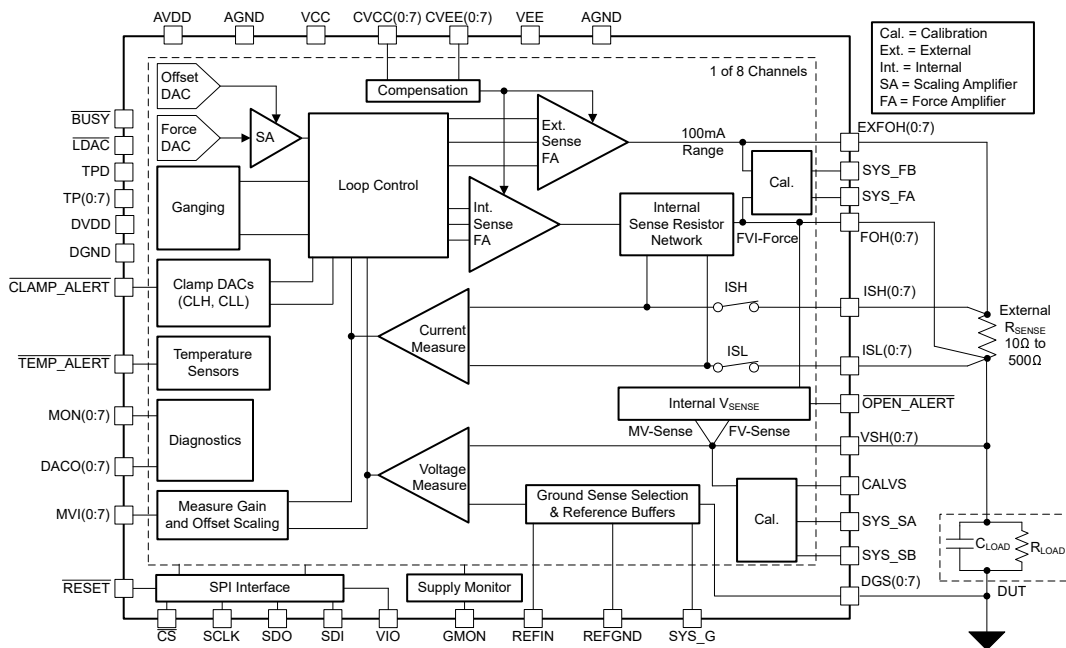
Block Diagram

4 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and aid development are listed below.

4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.2 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

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4.3 Trademarks

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4.4 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

TI Glossary   This glossary lists and explains terms, acronyms, and definitions.

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
December 2024	*	Initial Release

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

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