TSMU818A045 8-Channel, 18-Bit, 45V, 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}
- 45V 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

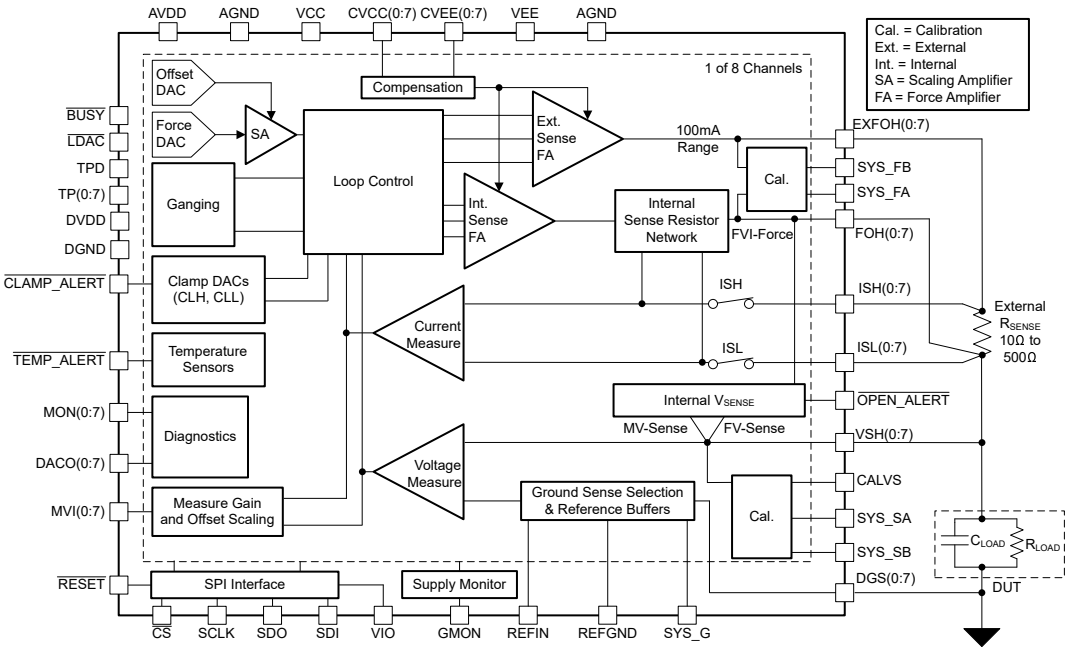
The TSMU818A045 is a high-performance, highly integrated parametric measurement unit (PMU) consisting of eight independent channels. Each channel includes one voltage output DAC that sets the programmable input levels for the force voltage amplifier, and two clamp input DACs. Five resistor-based, programmable, 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. An interface clock of 80MHz allows for fast-mode updates and state changes with the dual-state, double-buffered architecture. Configuration registers provide the ability to easily change force or measure conditions, DAC levels, and selected current ranges.

Package Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)
TSMU818A045	ACQ (FCBGA, 144)	16mm × 16mm
	AMO (FCBGA, 196)	20mm × 20mm

(1) For more information, see Section 11.
(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 2025	*	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.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
TSMU818A045AMO	Active	Production	FCBGA (AMO) | 196	60 | JEDEC TRAY (5+1)	-	SNAGCU	Level-3-260C-168 HR	0 to 100	TSMU818A045

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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