Fraunhofer IPMS

Fast. Reliable. Probe-station free.

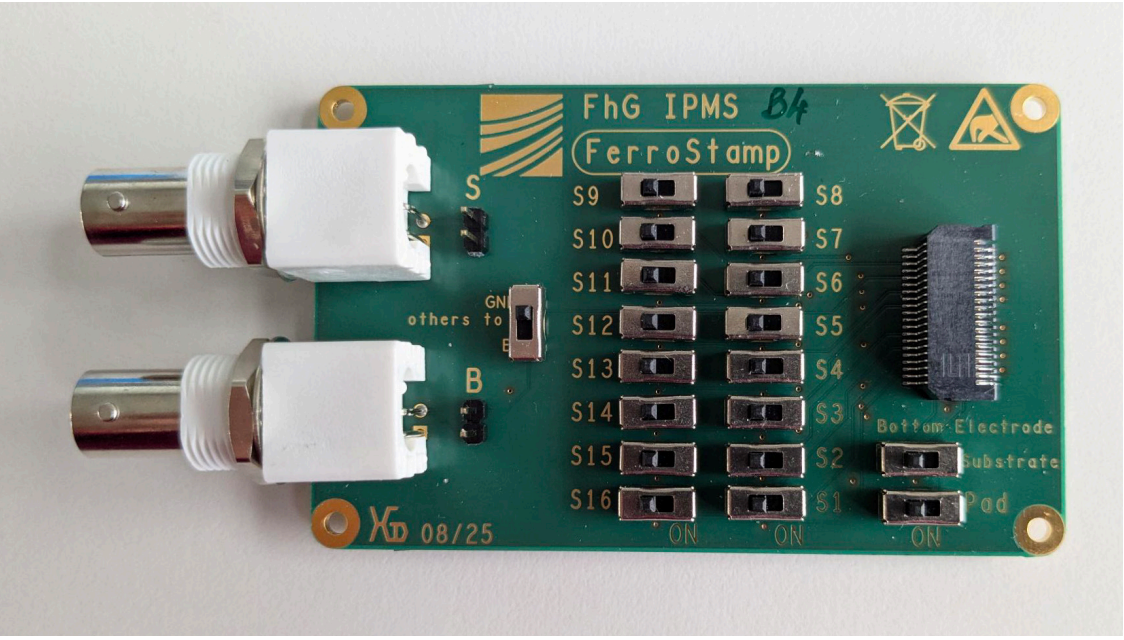
FerroStamp – Smart Platform for Ferroelectric Capacitor Measurements

FerroStamp, developed by Fraunhofer IPMS, is a modular and compact test platform that simplifies the electrical characterization of ferroelectric (FE) and dielectric capacitors. Its plug-and-measure design eliminates the need for a probe station, enabling direct, low-noise, and highly reproducible measurements with minimal parasitic effects.

Whether used for research, technology development, or measurement system calibration, FerroStamp provides a fast, reliable, and flexible solution for testing capacitive devices — from standard MIM structures to scaled ferroelectric elements.

Key benefits

- No manual probing or contact wear
  Fast and reliable sample exchange via PCB edge Connector
- Low parasitic capacitance – ideal for **scaled FE devices**
- Perfect for **instrument calibration and verification**
- Compatible with standard measurement equipment (BNC connection)



Contact

Konrad Seidel
+49 351 2607-3059
konrad.seidel@ipms.fraunhofer.de

Fraunhofer Institute for Photonic Microsystems IPMS
Center Nanoelectronic Technologies (CNT)
An der Bartlake 5
01109 Dresden, Germany

www.ipms.fraunhofer.de

Modular System Architecture

The FerroStamp platform consists of two key components:

1. Main Board

Integrated selection switches for different capacitor structures on the sample module. 16 selection switches are available, which can be connected in parallel, when multiple switches are turned ON

- Direct BNC interfaces for external measurement instruments
- Compact footprint: approx. 110 mm × 55 mm including BNC connector
- Designed for repeatable and noise-free operation

Figure 1

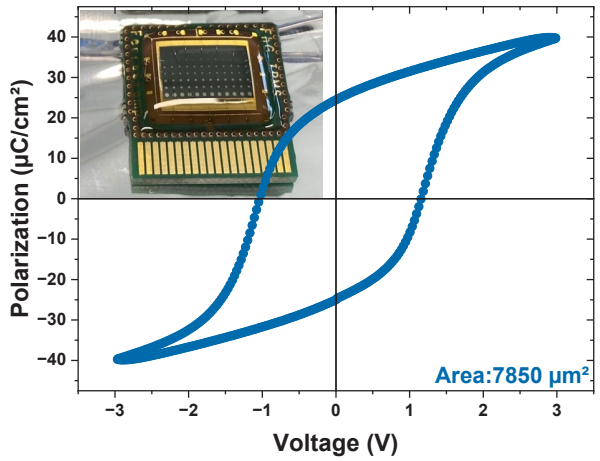
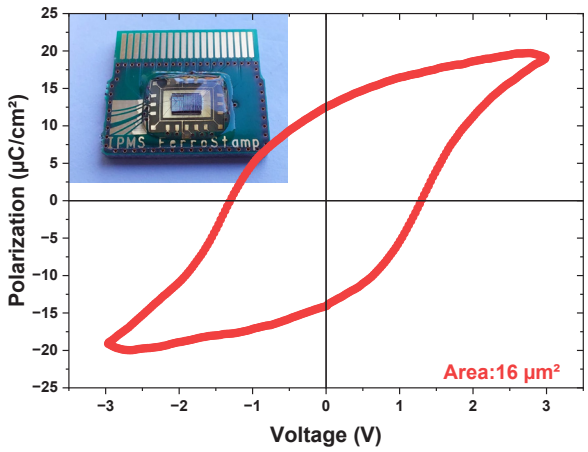


Figure 2



Polarization-Voltage hysteresis measurements using the FerroStamp board and plug in PCB sample module 1 (Fig. 1) for large dot capacitors and module 2 (Fig. 2) for integrated scaled capacitors.

2. Sample Module

Contains bonded FE test capacitors or MIM structures on a silicon

- Easily inserted into the main board via PCB edge connector system
- Typical PCB size: 18.5 mm × 18 mm
- Blanket PCB for experiments available on request
- Custom configurations available on request

Applications

- Probe station free electrical characterization of FE capacitors and MIM capacitors
- Benchmarking of dielectric and ferroelectric material systems
- Calibration and reference testing of measurement setups
- Analysis of scaling effects in advanced FE technologies

Technical Highlights

Feature	Description
Measurement type	FE and dielectric capacitor characterization
Interface	BNC (direct connection to measurement instruments)
Board size	86 mm × 54 mm
Supported sample size	8 mm × 10 mm
Parasitic capacitance	< 100 fF (typical)
Operation frequency range	100 Hz – 1 MHz
Contact system	Modular plug-in connector
Calibration option	Integrated reference (dielectric) capacitors selectable via switches
Reference Sample	Ferroelectric reference samples (DotCapacitors) available on request

Designed for Precision – Built for Convenience

With **FerroStamp**, Fraunhofer IPMS introduces a practical, high-precision platform for FE research and testing.
By combining robust hardware design with flexible measurement options, it supports both **academic R&D** and **industrial process optimization** — helping you focus on your materials and devices, not on the measurement setup.