aixACCT systems

aixCMA

From µN to kN

aixCMA- Testsystem

Based on our piezo electric evaluation systems (PES), the aixCMA systems offer comprehensive electrical and electromechanical characterization of devices for qualification and production control. Important actuator and sensor characteristics like blocking force diagram and actuator stiffness can be derived for wide temperature range. Special user defined excitation waveforms for electrical and mechanical load allow investigations of the device performance under real application conditions

Core part of the aixCMA system are the unique sample holder useful for wide range of different sized actuator or sensor devices. In combination with the corresponding force control units they are covering the range from sub µN measurements for MEMS devices, ultra small actuators for hard disk drives up to multilayer devices for fuel injection systems. This is in line with the idea of flexible test system that is able to handle different samples and various measurement types using the same basic setup.

CMA Measurement Features

Blocking force measurements

All CMA systems are able to perform BLF measurements using a dynamic force excitation.

Temperature dependent measurements

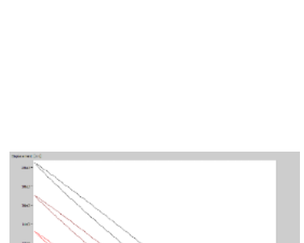
Depending on sample holder it is possible to do automated measurements between -40°C and 200°C.

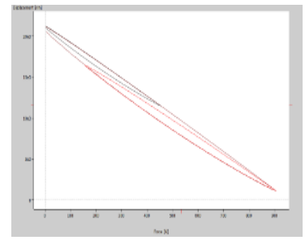
User defined waveforms

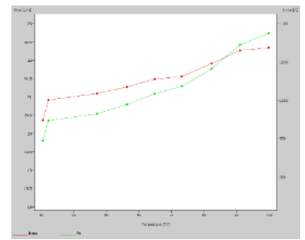
For excitation voltage and force to investigate devices under real environmental conditions, e.g. energy harvesting application

Direct measurement of d_{33}

Besides our standard indirect d_{33} measurements using large or small signal excitation, all CMA systems are able to perform direct d_{33} measurements with high excitation forces.







µCMA –
micro actuator testing

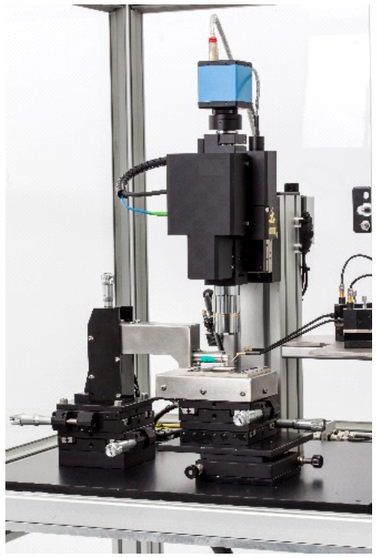
The µCMA is developed as sample holder unit to be used in conjunction with aixCMA measurement. With the help of the µCMA it is possible to measure smallest multilayer actuators, fibers, fiber composites or small thin bulk materials. Besides the precise measurement of large and small signal characteristics like Pr, C(V), large signal strain or d_{33} it allows the user to measure also the blocking force and stiffness of actuators. To do so the CMAµ is equipped with high precision micro manipulating stages, high precision microscope, displacement and force sensors.

CMA-
bulk and multilayer testing

The CMA sample holder is designed to test bulk and multilayer devices. Due the higher stiffness of these devices it offers the highest force measurement range. Dynamic forces of up to 6kN can be applied to the samples. Investigation with constant pre-loads of up to 20kN can be done as well.

The system is equipped with a flexible contacting system that allows the use of different electrode configurations. Either a top and bottom topology as well as side contacts for multilayers can be used.

Thus the selection of different measurement topologies such as d_{31}, d_{33} or even d_{32} (single crystal) is possible.



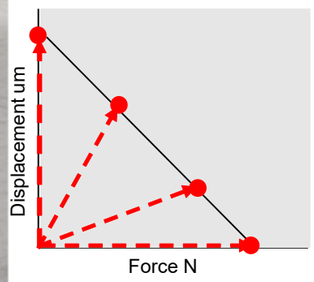
Integrated heating system allows temperature dependent measurements -60°C->200°C

nano CMA – MEMS testing

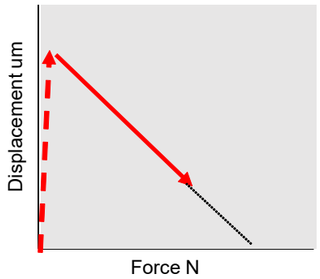
The increasing number of application for pzt based MEMS devices requires more specific and detailed investigation of the electro-mechanical properties not only on the film itself but also on the processed MEMS structure. Therefore our DBLI tools can be equipped with an extension in order to measure mechanical properties of the membranes and cantilevers even on wafer level. It allows the determination of blocking force or stiffness of a MEMS structures.

A µN accuracy is achieved by an additional Laser inter-ferometer. In combination with force controlling system it is possible to apply a defined force to the device. This is allows also the determination of the d_{33} stress, which is important for sensing applications. Special cantilever allow also the measurement of contact resistance vs. contact force for micro switches.

The collected information are used to enhance the simulations or used for quality control.



Conventional measuring method for blf



Superposition of variable stiffness and applied force

Specification

µCMA

Maximum sample voltage	400 V (4kV optional)
Max. sample deflection approx.	400 µm (sample dependent)
Max. Range of Force measurement	2N
Resolution	5mN
Measurement frequency (min)	below 10Hz (clamped sample with a defined pre-load)
Measurement frequency (max)	up to 100kHz (without pre-load on sample surface)
Temperature range	Rt -> 200°C
Resolution	0,1°C
Laser Resolution	0,3nm
Possible measurements	Piezo,CVM, BLF,fatigue, thermo, leakage, dynamic hysteresis, breakdown, poling

nanoCMA (aixDBLI)

Maximum sample voltage	400 V (4kV optional)
Max. Range of Force measurement	1mN
Resolution	1µN
Temperature range	Rt only

CMA

Maximum sample voltage	10 kV
Max. sample deflection approx.	100 µm (sample dependent)
Max. Range of Force measurement	20 kN
Resolution	100 mN
Temperature range	Rt -> 200°C
Laser Resolution	10 nm
Possible measurements	blf, fatigue, thermo, leakage, dynamic hysteresis, breakdown, poling, etc.

Please contact us for more detailed information!

aixACCT systems

aixACCT Systems GmbH

Talbostraße 25
52068 Aachen, Germany

Phone: +49(0)241475703-0
Fax: + 49(0)241475703-66

E-Mail: info@aixacct.com
Web: www.aixacct.com

TOP 100
top100.de
top innovator 2022