



TF Analyzer Series

TF Analyzer modular design concept

Based on the idea of a modular and flexible designed measurement system, aixacct created the TF Analyzer platforms. To close the gap between pure electrical testing with reduced requirements and high specialized testing solutions for production control aixacct developed a variety of Analyzer platforms, ranging from TFA1000 to TFA3000.

In 1999, the very first TF Analyzer allowed our customers to carry out measurements on 300 nm pads. This made it possible to precisely measure storage structures for the first time, all thanks to the compensation method developed by aixACCT Systems. This method enables users to differentiate currents created through parasitic capacities like a supply cable from the actual switching currents of the material.

Standard features of the TF Analyzer are:

- › Dynamic Hysteresis measurement - DHM
- › Fatigue measurement - FM
- › Retention measurement - RM
- › Imprint measurement - IM
- › Leakage current measurement - LM

and optional:

- › C(V) measurement - CVM
- › Piezo measurement - PZM
- › Pulse Measurement – PM
- › Static Hysteresis measurement – SHM

aixplorer 3.0 – Communicate and Control

The aixplorer 3.0 software is a key part of every TF Analyzer. It maintains communication with other devices and can control complex measurement systems, while the analyzer itself acts as a control and data collection system.

TF1000

The ferroelectric test system TF Analyzer 1000 is designed to allow various measurements on ferroelectric materials to determine its main electric characteristics.

The TF Analyzer 1000 includes a built-in function generator, an analog input board, and a wide bandwidth virtual ground amplifier with driving unit. This system offers hysteresis measurements from 0.1 Hz to 1000 Hz bandwidth depending on the excitation voltage in virtual ground mode



TF2000E

The TF Analyzer 2000 E is one of the most sophisticated analyzer of electro ceramic material and devices. Thus it represents the most used core product of our aixPES systems.

The test equipment is based on a modular idea, where four different probe heads can be connected to one and the same basic unit. Each of the four probe heads represents a different characterization method.



TF3000

The TF Analyzer 3000 is the flagship of the TF Analyzer family. It offers the highest frequency ranges, without any restriction regarding input resolution. Therefore, it is the ideal partner for dedicated high speed testing of electro ceramic material and devices. The TF Analyzer is also used in High Speed PES and CMA systems.

The test equipment is based on the same modular idea like the TF2000E, where four different probe heads can be connected to one and the same basic unit. Each of the four probe heads represents a different characterization method. In combination with the FE-Module enhanced it offers a 1MHz frequency range for hysteresis measurement of ferroelectric materials. No other system on the market allows a higher frequency for those measurements.

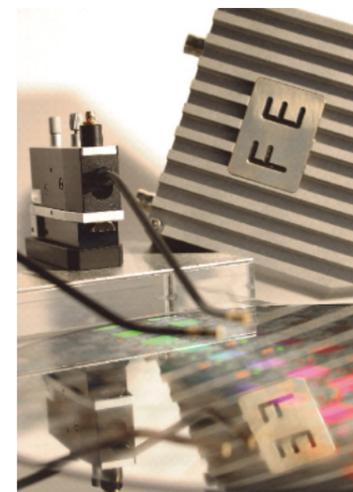
The system is optionally available with high frequency 150V built in amplifier that covers a frequency range of 1MHz.

FE Modul

The ferroelectric test module (FE module) is designed to perform various measurements on ferroelectric materials to determine its main electronic characteristics.

Standard measurements that can be performed with the FE-Module are:

- Hysteresis measurement
- PUND measurement
- Fatigue measurement
- Retention measurement
- Static hysteresis measurement
- Imprint measurement
- Leakage Current measurement



Specification

TF1000

Driving unit:
 Voltage range ± 10 V
 Output impedance 50Ω
 Maximum hysteresis frequency 1000 Hz
 Min. pulse width $5 \mu\text{s}$
 Max. fatigue frequency 100kHz
 Slew rate (typical) $> 10 \text{ V}/\mu\text{s}$
 4 x16bit input resolution
 16 bit output resolution
 Max. capacitive load (freq. dependent) 100 nF
 Maximum output current ± 1 A

Current amplifier:
 Voltage virtual ground input
 Current range 1 nA - 1 A
 High-voltage protection



TF2000

TFANALYZER 2000E hardware

Arbitrary waveform generator 1MHz, 16bit, ± 5 V
 Analog Input channels 1MS/s, ± 10 V, 16 bit
 IEEE interface, optional
 Serial interface
 LAN adapter

FE module hardware

Driving unit:
 Voltage range ± 25 V other voltages on request
 Output impedance 10Ω
 Maximum hysteresis frequency 5kHz
 Min. pulse width $2 \mu\text{s}$
 Min. rise time $1 \mu\text{s}$
 Max. fatigue frequency 300kHz
 Slew rate (typical) $> 200 \text{ V}/\mu\text{s}$
 Max. capacitive load (freq. dependent) $1 \mu\text{F}$
 Maximum output current ± 1 A

Current amplifier:
 Voltage virtual ground input
 Current range 1 pA - 1 A
 High-voltage protection

More specification on request!

TF3000

TFANALYZER 3000 hardware

Output channel:
 Arbitrary waveform generator up to 100 Ms/s
 (*CMA option: additional 16bit Arbitrary Waveform generator)
 1000 points in $10 \mu\text{s}$
 Pulswidth down to 50ns
 150V built-in amplifier with 1MHz bandwidth (optional)
 Analog Input channels:
 Up to 40MS/s, ± 10 V, 16 bit
 Capture rate true 25ns without interlace
 IEEE interface, optional
 Serial interface
 LAN adapter

FE module hardware

Driving unit:
 Voltage range ± 30 V other voltages on request
 Output impedance 10Ω
 Maximum hysteresis frequency with bandwidth
 current amplifier 250kHz
 Max. hysteresis frequency with high speed integrator 1MHz
 Min. pulse width 50 ns
 Min. rise time 10 ns
 Max. fatigue frequency 16 MHz
 Slew rate (typical) $> 200 \text{ V}/\mu\text{s}$
 Max. capacitive load (freq. dependent) 1 nF
 Maximum output current ± 1 A

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