

Solutions Brief:

Autonomous Calibrations and Measurements of RF Devices Over Multiple Temperatures

Enabled by Contact Intelligence Technology



Only the Autonomous RF measurement assistant, a combination of programmable positioners, a precise digital microscopy system and advanced pattern recognition algorithms, enables fully autonomous, hands-free calibrations and measurements of RF devices over multiple temperatures.

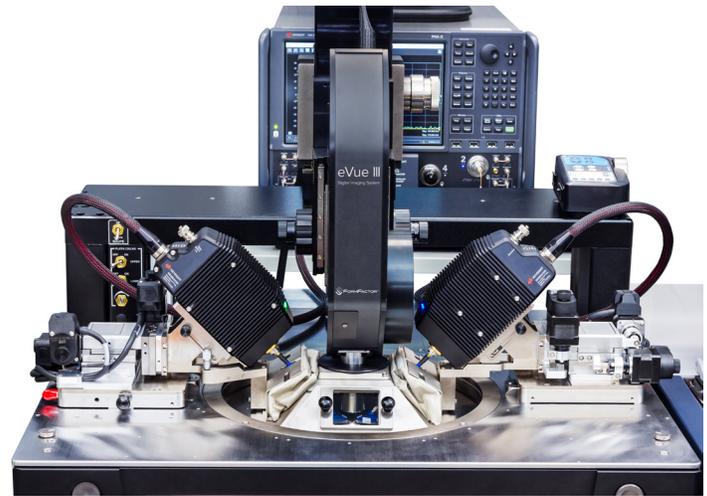
Contact Intelligence™ Technology for RF Device Modelling



With the demand for faster time to market for new high-frequency ICs in markets such as 5G, autonomous vehicles and next-generation WiFi,

IC designers need the highest quality process design kits (PDKs) from the foundry or fab to make sure their designs work on the first iteration. Poor PDKs will lead to more design iterations and not meeting launch time expectations. For more accurate PDKs, foundries and fabs need to ensure they make the highest precision measurements and measure more devices to improve device models that make up the PDKs. Normal testing of RF device modelling requires large amounts of time from the engineer to perform re-calibrations whenever the system drifts beyond a usable limit. Repositioning of the probes when changing temperature, also requires user intervention.

With FormFactor's Contact Intelligence technology, the operator can start a test and leave the system measuring during the whole shift, overnight or even over the weekend, without any user intervention. Contact Intelligence enables true hands-free and autonomous RF calibrations and measurements over multiple temperatures. Velox™ software controlled programmable positioners and, probe tip recognition algorithms coordinate with our WinCal XE™ calibration software to automatically recalibrate if the system performance drifts beyond a usable limit. Probes are dynamically corrected for the most accurate pad placement on-the-fly to compensate for any thermal expansion of the probes or device when changing temperature. This results in testing more devices in a shorter time, with higher confidence in the RF measurement performance, leading to more accurate PDKs and faster time to market. photonics probing, testing and measuring.



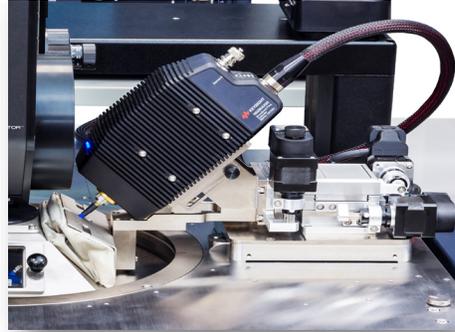
FEATURE HIGHLIGHTS

- **Ease of use** – An inexperienced operator can perform an RF calibration up to 120 GHz by simply pushing a button. This reduces the need of the experienced users full time on each system.
- **Reduced Soak Time** – System will re-align the probes to the pads if they drift away from alignment. This reduces the time of test and increases throughput.
- **Unattended Use** – Measurements can be left running over night or the weekend, testing all devices on the wafer, and at different temperatures without the need of the operator.
- **Calibration Monitor and Re-calibration** – System will continuously monitor calibration drift, and automatically re-calibrate the system should the drift exceed a pre-defined limit.

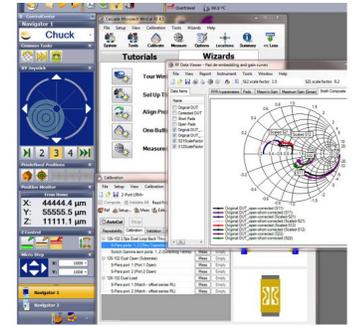
FormFactor's Autonomous RF Measurement Assistant



CM300xi, SUMMIT200,
Summit™ 12000 or Elite™ 300



Advanced Programmable
Positioners

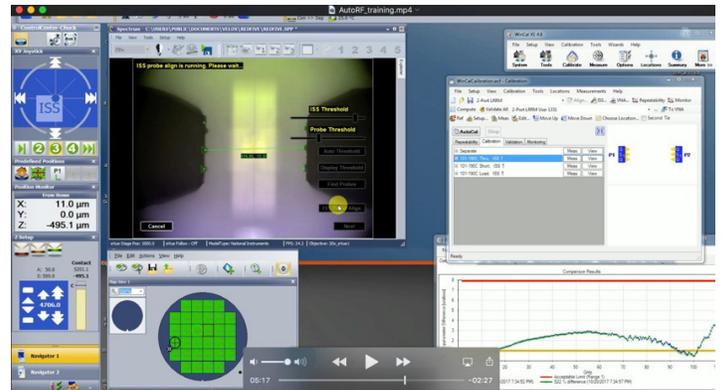


WinCal XE and Velox

Autonomous RF measurement assistant - Sophisticated optical alignment algorithms combine with high-precision programmable positioners automate the probe to pad alignment of the RF and DC probes on the device under test and calibration substrate

Velox Software Is Key to the Autonomous Operation

FormFactor's Velox software allows the system to automatically detect probe tip location with reference to probe pads and alignment marks on the calibration substrate. Velox then controls the programmable positioners to place the probes accurately on the pads or calibration standards for each touchdown.



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