



# SWTest Conference

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SIGMA SENSORS



## Sigma Sensors Temperature Calibration Laboratories GmbH

### AUTOMATED TEMPERATURE CALIBRATION ROUTINE FOR PROBER CHUCKS (-60C to +200C)

For ALL analytical and production wafer probers / chucks  
varying levels of automation: manual, semi, fully automated



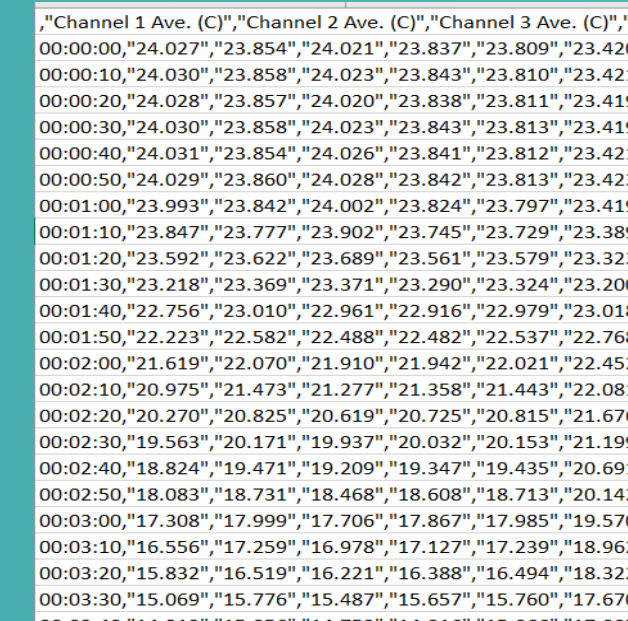
Courtesy MPI



Courtesy Accretch



Courtesy ATT



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Analytical / automated prober w/ chuck + calibration wafer, output data and sw/com interface

### MEASUREMENT SET-UP

- THERMAL SOURCE: - MPI 300mm analytical wafer prober  
REFERENCE: - SIGMA SENSORS 300mm calibration wafer,  
ISO/IEC17025:2017 accredited calibrated  
- PICO logging hardware interface  
- MAESMATIC software and comm interface

### SIMPLE STEPS

- Wafer set-up 5min
- Enter temperature and logging profile 5min
- Push START button
- Prober executes prescribed temperature profile
- Relevant data is extracted
- Set temp, average, offset
- Interface feeds offsets back into prober / controller
- Measuring sequence repeated (method 2 in-situ offset adjust)
- Data / certificate output
- Remove wafer 5min






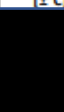
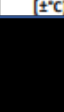




READY FOR THE TEST™

**Company Confidential**

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<b>Sollwert</b>	-40,0	-20,0	-10,0	25,0	85,0	130,0	160,0	200,0
<b>Max-Wert:</b>				25,5	85,7	131,0	161,1	
<b>Min-Wert:</b>				25,1	84,6	129,1	158,5	
<b>Mittelwert:</b>				25,3	85,2	130,0	159,8	
<b>Korr.-Wert:</b>				-0,3	-0,2	0,0	0,2	

 <b>Sigma Sensors (TCL) GmbH</b>		 		Report 15-23_6040		
Set Temperature [°C]	Sensor Position	Found Temperature [°C]	Correction Value [°C]	Average [°C]	Uniformity [°C]	Expanded Uncertainty [K=2] [°C]
-25 °C	S1	-25.14	0.14	-25.08	0.24	
	S2	-24.84	0.06			
	S3	-24.93	0.01			
	S4	-25.18	0.18			
	S5	-25.15	0.15			
Set Temperature [°C]	Sensor Position	Found Temperature [°C]	Correction Value [°C]	Average [°C]	Uniformity [°C]	Expanded Uncertainty [K=2] [°C]
25 °C	S1	25.01	0.01	25.02	0.04	
	S2	25.03	0.03			
	S3	25.04	0.04			
	S4	25.00	0.00			
	S5	25.02	0.02			
Set Temperature [°C]	Sensor Position	Found Temperature [°C]	Correction Value [°C]	Average [°C]	Uniformity [°C]	Expanded Uncertainty [K=2] [°C]
85 °C	S1	85.13	0.13	85.04	0.42	
	S2	84.76	0.26			
	S3	85.10	0.10			
	S4	85.08	0.08			
	S5	85.16	0.16			
Set Temperature [°C]	Sensor Position	Found Temperature [°C]	Correction Value [°C]	Average [°C]	Uniformity [°C]	Expanded Uncertainty [K=2] [°C]
125 °C	S1	125.34	0.34	125.21	0.42	
	S2	124.93	0.07			
	S3	125.35	0.35			
	S4	125.30	0.30			
	S5	125.16	0.16			

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## RESULTS

Works on first try  
Easy to implement, even DIY

## OBSERVATIONS

- Platform independent
- Prober / chuck communication command sets are published
- Multiple options to control prober / chuck
- HW/SW Interface required
- Measurement data output csv
- Open-source SW offers customization options
- Static and dynamic data averages possible
- Raw data output to accredited certificates possible

## ADVANTAGES

Standardize processes across multiple platforms  
Provide consistent measurement results  
Reduce bias and lost data  
Ensure traceability and compliance  
Fulfill documentary requirements  
Reduce manpower requirements by up to 95%  
outstanding ROI

## About SIGMA SENSORS

SIGMA SENSORS (TCL) supplies the global semiconductor industry with surface temperature measurement and calibration solutions ranging from free-standing 1-18 sensor calibration wafers to complete, advanced automated calibration systems. SIGMA SENSORS provides ISO/IEC17025:2017 accredited and / or NIST traceable on-site / remote calibration services for up to 8 waferprobe systems parallel.

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