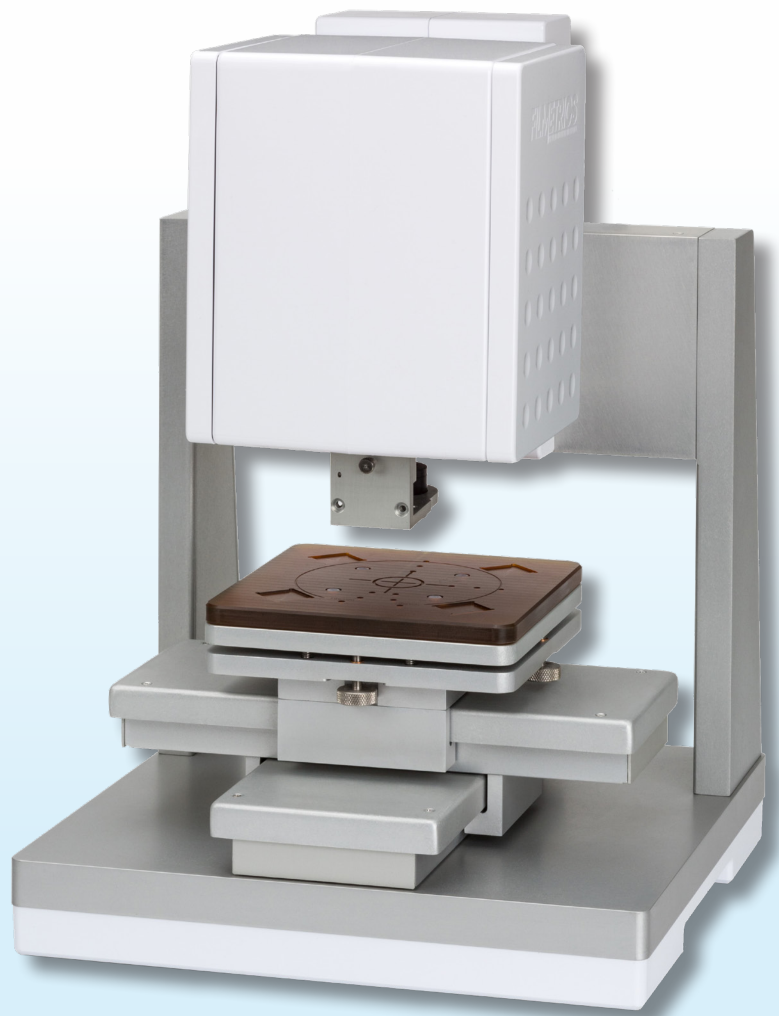
R50 Series Resistivity Mapper

Automated Resistivity Film Mapping

The Filmetrics R50 series provides contact four-point probe (4PP) and non-contact eddy current (EC) measurements. The R50 maps conductive film resistivity/conductivity as quickly as 1point/sec. The motorized X-Y stage uses a standard wafer chuck or custom sample holder for up to 300mm sample sizes and up to 200mm measurement area.

New! R50 Series

- Four-point probe and eddy-current probe systems
- Sample mapping in rectangular, linear, polar and custom configurations
- X-Y travel up to 200mm
- Measure a ten-decade range of sheet resistance on conductive and semi-conductive films
- Contact and non-contact measurement



Standard Features:

- Automated X-Y stage with:
  100mm x 100mm travel
  200mm x 200mm travel (-200 models)
- 100mm Z-stage travel
- Tip-tilt stage with +/-5° travel
- Unlimited number of measurement locations in sample map

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R50 Series Software

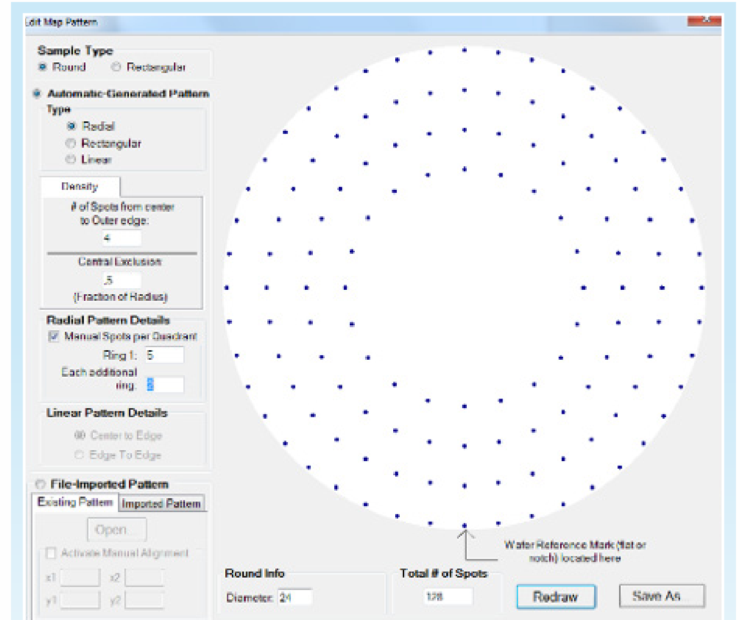
RsMapper Software: Measurement Automation

THE MAP PATTERN GENERATOR

The built-in map pattern generator lets you easily generate the spot patterns needed to measure the relevant area of your samples, thus saving time during data acquisition.

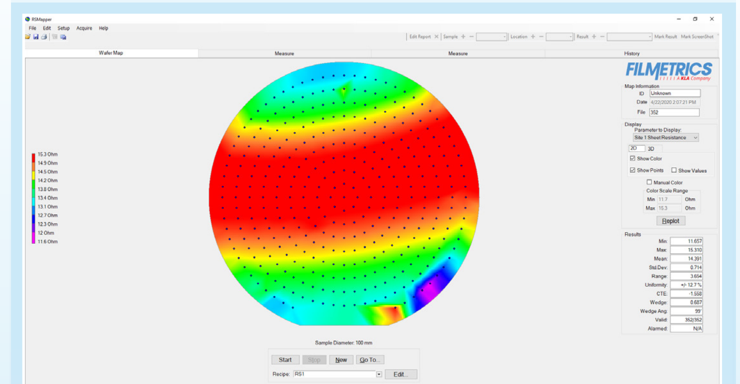
Here are only some of the parameters you can adjust to customize your map's properties:

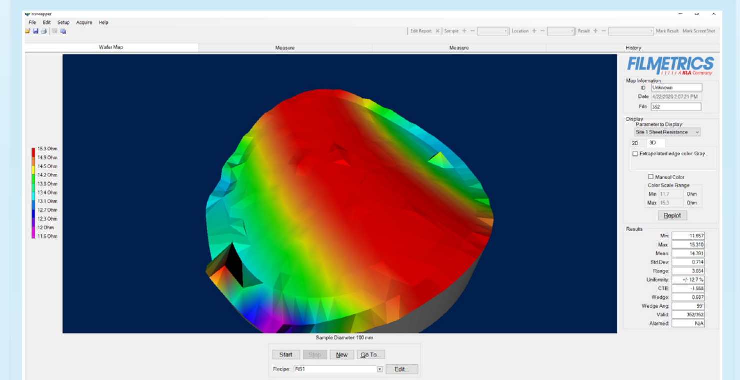
- Round or square maps
- Radial or rectangular patterns
- Center or edge exclusion
- Spot density



MEASUREMENT RESULTS VISUALIZATION IN 2D AND 3D

Whether you are measuring resistivity, sheet resistance, or conductivity, RsMapper lets you display the resulting measurement maps in either 2D or 3D. Switch easily between the maps for the individual measurement parameters and freely rotate 3D profiles to get an optimal view of the results.





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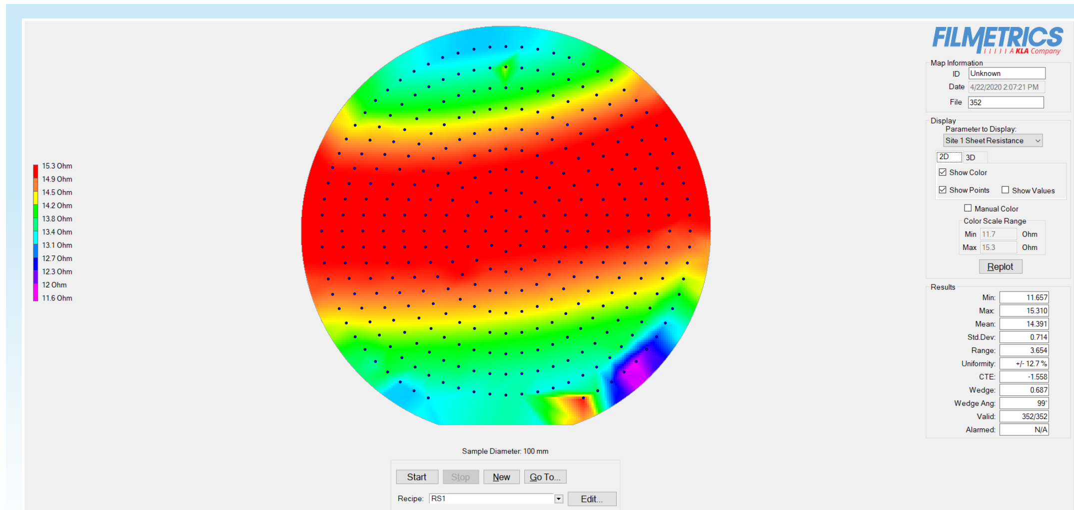
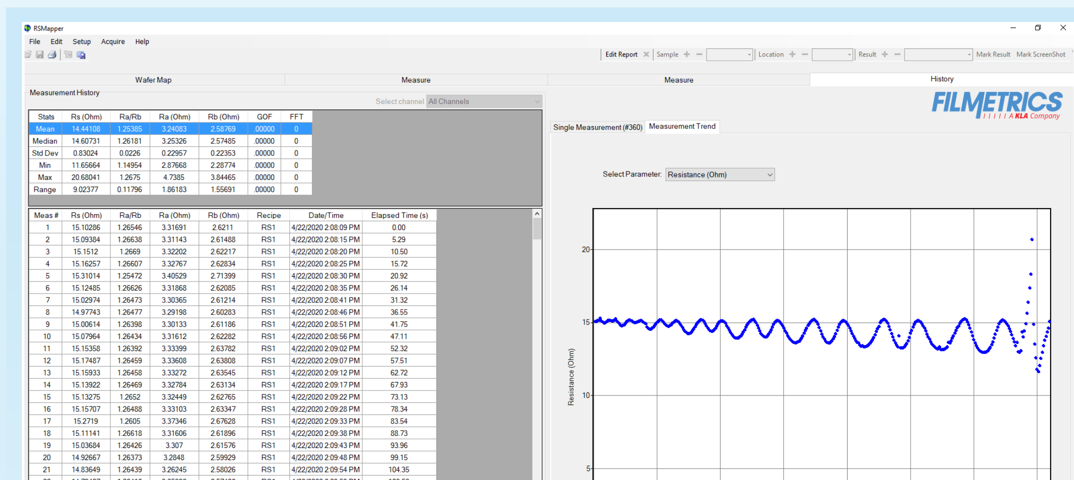
TIWN FILM UNIFORMITY

The RsMapper software generates easy-to-visualize maps of the varying film resistivity. The measured sheet resistance map of a TiWN film pictured below illustrates the variation in film thickness across the wafer due to the deposition process. The map reveals the non-radial variation of the process.



HIGH SIGNAL-TO-NOISE MEASUREMENTS OF A METAL FILM ON SI

The R50-4PP system gives the user the option to review the measurement map as a graph of points relating the resistivity to the time each measurement was made. The plotted points illustrate the quality of the signal-to-noise of the system with varying resistivity. The history tab is an ideal tool for production use cases and illustrates any point anomalies in a film. These can be traced back to specific wafer locations and investigated further to diagnose process issues.



Stats	Rs (Ohm)	Ra/Rb	Ra (Ohm)	Rb (Ohm)	GOF	FFT
Mean	14.44108	1.25385	3.24083	2.58769	.00000	0
Median	14.60731	1.26181	3.25326	2.57485	.00000	0
Std Dev	0.83024	0.0226	0.22957	0.22353	.00000	0
Min	11.65664	1.14954	2.87668	2.28774	.00000	0
Max	20.68041	1.2675	4.7385	3.84465	.00000	0
Range	9.02377	0.11796	1.86183	1.55691	.00000	0

Meas #	Rs (Ohm)	Ra/Rb	Ra (Ohm)	Rb (Ohm)	Recipe	Date/Time	Elapsed Time (s)
1	15.10286	1.26546	3.31691	2.6211	RS1	4/22/2020 2:08:09 PM	0.00
2	15.09384	1.26638	3.31143	2.61488	RS1	4/22/2020 2:08:15 PM	5.29
3	15.1512	1.2669	3.32202	2.62217	RS1	4/22/2020 2:08:20 PM	10.50
4	15.16257	1.26607	3.32767	2.62834	RS1	4/22/2020 2:08:25 PM	15.72
5	15.31014	1.25472	3.40529	2.71399	RS1	4/22/2020 2:08:30 PM	20.92
6	15.12485	1.26626	3.31868	2.62085	RS1	4/22/2020 2:08:35 PM	26.14
7	15.02974	1.26473	3.30365	2.61214	RS1	4/22/2020 2:08:41 PM	31.32
8	14.97743	1.26477	3.29198	2.60283	RS1	4/22/2020 2:08:46 PM	36.55
9	15.00614	1.26398	3.30133	2.61186	RS1	4/22/2020 2:08:51 PM	41.75
10	15.07964	1.26434	3.31612	2.62282	RS1	4/22/2020 2:08:56 PM	47.11
11	15.15358	1.26392	3.33399	2.63782	RS1	4/22/2020 2:09:02 PM	52.32
12	15.17487	1.26459	3.33608	2.63808	RS1	4/22/2020 2:09:07 PM	57.51
13	15.15933	1.26458	3.33272	2.63545	RS1	4/22/2020 2:09:12 PM	62.72
14	15.13922	1.26469	3.32784	2.63134	RS1	4/22/2020 2:09:17 PM	67.93
15	15.13275	1.2652	3.32449	2.62765	RS1	4/22/2020 2:09:22 PM	73.13
16	15.15707	1.26488	3.33103	2.63347	RS1	4/22/2020 2:09:28 PM	78.34
17	15.2719	1.2605	3.37346	2.67628	RS1	4/22/2020 2:09:33 PM	83.54
18	15.11141	1.26618	3.31606	2.61896	RS1	4/22/2020 2:09:38 PM	88.73
19	15.03684	1.26426	3.307	2.61576	RS1	4/22/2020 2:09:43 PM	93.96
20	14.92667	1.26373	3.2848	2.59929	RS1	4/22/2020 2:09:48 PM	99.15
21	14.83649	1.26439	3.26245	2.58026	RS1	4/22/2020 2:09:54 PM	104.35

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R50 Specifications

General

Z Range	100mm
Z Stage Type	Automated
X-Y Stage Type	Automated
Sample Max Weight	2.5kg
Tip-Tilt Stage	+/- 5°, Manual

Mechanical Performance

X-Y Stage Range	100mm x 100mm
Sample Max Width	265mm
System Size, W x D x H	305mm x 305mm x 550mm
System Weight	15kg

X-Y Stage Range	200mm x 200mm
Sample Max Width	365mm
System Size, W x D x H	406mm x 406mm x 550mm
System Weight	22kg

Electrical Performance 4PP

Site Repeatability	<0.2%
Accuracy	+/- 1%
Measurement Range [1]	5mOhm/sq - 5MOhm/sq
Matching [1]	<0.2%

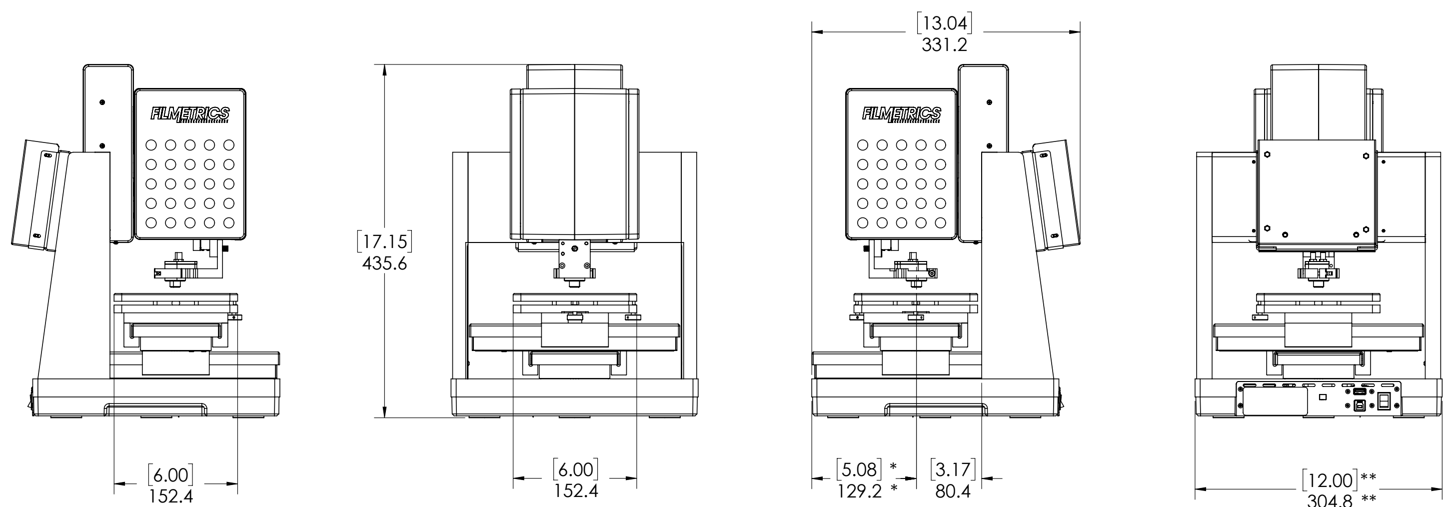
Electrical Performance EC

Site Repeatability	<0.2%
Accuracy	+/- 1%
Measurement Range [1]	1mOhm/sq - 10Ohm/sq
Matching [1]	<0.2%
ISO 25178 Compliant	Yes

4PP (four-point probe)

Probes	Type A	Type C	Type E	Type F
Probe Spacing	40mil (1mm)	40mil (1mm)	62.5mil (1.625mm)	25mil (0.625mm)
Probe Contact Radius	1.6mil	8mil	1.6mil	1.6mil

[1] Typical value



*179.2mm/7.05" for R50-4PP-200 and R50-EC-200
**404.8mm/15.94" for R50-4PP-200 and R50-EC-200