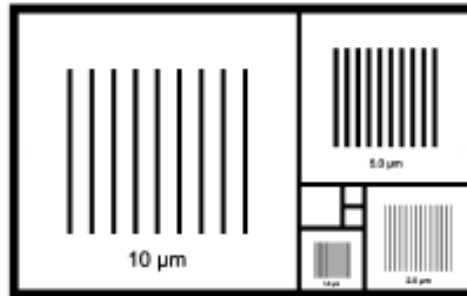
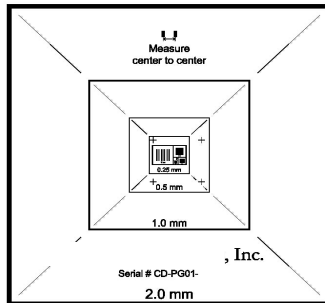


Wafer Level Certificate of Traceability for Critical Dimension Standard Pelcotec™ CDMS- 1T, 2mm - 1μm, Traceable



Product Number: 682-1 and 682-1A through 682-1Z

Product Description: 2.5x2.5mm Critical Dimension Magnification Standard

Wafer Identifier: CD-UC01

The accuracy of these products was determined by reference comparison to working standards traceable to the National Institute of Standards and Technology (NIST), Test No. 861/280822-11.

Line	Average pitch of wafer	Number of lines averaged	Average pitch uniformity (1σ uncertainty)	Total expanded uncertainty (3σ) average pitch for wafer*
2.0mm	2.00mm	2	± 2μm (±0.10%)	± 7μm (±0.35%)
1.0mm	1.00mm	2	± 1μm (±0.10%)	± 3.5μm (±0.35%)
0.5mm	0.500mm	2	± 0.5μm (±0.10%)	± 1.75μm (±0.35%)
0.25mm	0.250mm	2	± 0.25μm (±0.10%)	± 0.9μm (±0.35%)
10μm	10.00μm	9	± 0.01μm (±0.10%)	± 0.035μm (±0.35%)
5μm	5.00μm	12	± 0.01μm (±0.20%)	± 0.035μm (±0.70%)
2μm	2.00μm	10	± 0.004μm (±0.20%)	± 0.014μm (±0.70%)
1μm	1.00μm	10	± 0.002μm (±0.20%)	± 0.007μm (±0.70%)

* The 3σ uncertainty (95% confidence interval) average pitch is determined using a minimum of nine die per production wafer. Each average pitch is determined using 100+ measurements on each die averaged over the stated number of lines. The total expanded uncertainty includes both Type A and Type B uncertainties corrected for sample size using an appropriate Student t-factor.

Equipment used:

Instrument	Model number	Serial Number	NIST Certified CD/Recalibration	Resolution	Repeatability
FE-SEM	FEI Helios 600i	D9922192	CD-PG01-0211/June 2014	0.9nm	0.03%

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682-1 TN VUC-01 04292014