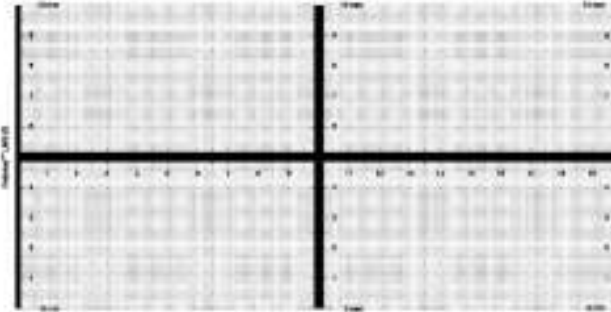


## Wafer Level Certificate of Traceability

### Pelcotec™ LMS-20 Low Magnification Silicon Calibration Standard



Product Number: 688-1 and 688-1G through 688-1S Pelcotec™ LMS-20T

Product Description: 22 x 11mm Pelcotec™ 1mm Low Magnification Calibration Standard

Product Serial Numbers: TJ01-xxx through TJ05-xxx

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.

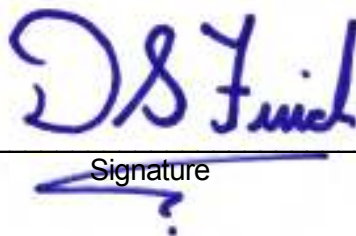
Line	Average pitch (horizontal and vertical)	Standard Deviation (1 $\sigma$ )	Total expanded uncertainty (3 $\sigma$ )
1.0mm	1.00mm	$\pm 0.003\text{mm}$	$\pm 0.010\text{mm}$
0.5mm	0.50mm	$\pm 0.002\text{mm}$	$\pm 0.005\text{mm}$
0.1mm	0.10mm	$\pm 0.0007\text{mm}$	$\pm 0.0025\text{mm}$
0.01mm	0.010mm	$\pm 0.0007\text{mm}$	$\pm 0.0025\text{mm}$

The average pitch was determined using ten die randomly sampled from a batch of production wafers (TJ01 through TJ05). A total of 80 center-to-center measurements were taken across each of the ten die. 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	Manufacturer	Serial #	Objective Lenses	NIST Certified CD/Recalibration	Repeatability
Light Microscope	Reichert-Jung	742	4x, 0.1N.A., 10x, 0.25N.A. & 20x 0.5N.A. Plan Achromat.	CD-PG01-0211/June 2014	0.07%

Dudley S Finch  
Certified by



Signature

November 20<sup>th</sup> 2013  
Date

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