MEGAPOSIT® SPR®955-CM SERIES PHOTO RESISTS

MEGAPOSIT® SPR®955-CM SERIES PHOTO RESIST is designed for high throughput, critical level processing of contact hole and dense metal features and is optimized for 0.24N and 0.26N developers.

Features:

- Design rules:
  ≥ 0.30 µm contact hole on oxide
  ≥ 0.35 µm dense features on metal
- Optimized for anti-reflective coatings, organic and inorganic
- Broad depth of focus with minimum focus tilt
- High throughput:
  Exposure:
  0.35 µm CH = 235 mJ/cm² (0.26N)
  0.40 µm Dense L/S = 165 mJ/cm² (0.26N)
  Develop:
  45-60 sec. single puddle flexibility

Recommended Process Conditions

Contact Holes

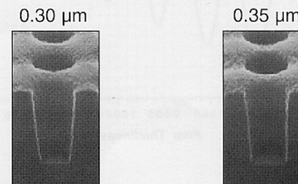
Thickness:	0.70–1.20 µm
Softbake:	90°C/90 sec. Proximity Hotplate
PEB:	120°C/90 sec. Proximity Hotplate
Developer:	LDD-26W (0.26N) MEGAPOSIT® MF®-501 or MEGAPOSIT® MF®-701 (0.24N)

Lines/Spaces

Thickness:	1.30–2.30 µm
Softbake:	100°C/90 sec. Proximity Hotplate
PEB:	110°C/90 sec. Proximity Hotplate
Developer:	LDD-26W (0.26N) MF-501 or MF-701 (0.24N)

Contact Hole Resolution

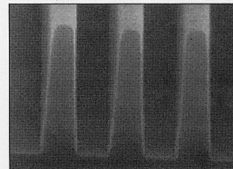
0.30 µm 0.35 µm



Film Thickness: 0.865 µm
Substrate: 3,000 Å Silicon Oxide
Develop: MF-501 (0.24N)

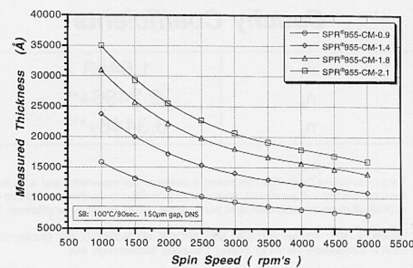
Dense Metal Feature Resolution

0.34 µm Dense Line/Space

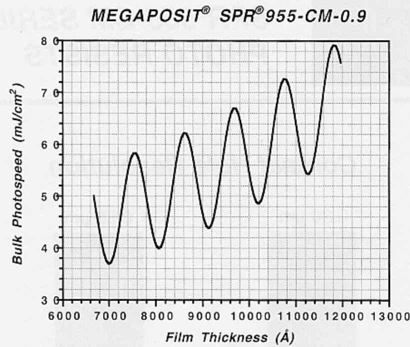


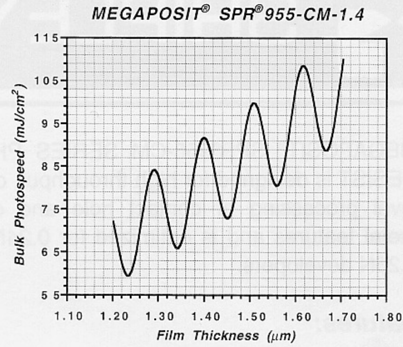
Film Thickness: 1.40 µm
Substrate: 400 Å Titanium Nitride
Develop: MF-501 (0.24N)

Spin Speed Curves



Interference Curves





Lithographic Performance

Contact Hole Application		
Lithographic Performance Results	Developer Type	
Substrate	3KÅ SiO_2	
Developer Normality	0.24	0.26
Film Thickness (µm) Photospeed (mJ/cm²)	0.865 78	0.865 55
0.35 µm E-Size (mJ/cm²) 0.35 µm E_s:E_0 Ratio	270 3.46	235 4.27
0.40 µm E-Size (mJ/cm²) 0.40 µm E_s:E_0 Ratio	225 2.88	170 3.10
Dense Resolution (µm)	0.30	0.30
0.35 Dense DoF (µm) 0.40 Dense DoF (µm)	≥1.00 ≥1.10	≥0.90 ≥1.00
0.35 Expo. Latitude (%) 0.40 Expo. Latitude (%)	21.2 28.7	21.0 29.0

Thick Photoresist for Metal Applications								
Lithographic Performance Results	0.24N Developer Applies to BARC and TiN				0.26N Developer Applies to BARC and TiN			
Film Thickness (µm)	1.30	1.50	1.80	2.30	1.30	1.50	1.80	2.30
Photospeed (mJ/cm²)	96	116	143	191	78	89	110	148
0.4 µm E-Size (mJ/cm²)	210	244	301	402	165	194	225	313
0.4 µm E_s:E_0 Ratio	2.19	2.18	2.10	2.10	2.12	2.18	2.00	2.10
0.5 µm E-Size (mJ/cm²)	210	244	278	338	170	194	205	265
0.5 µm E_s:E_0 Ratio	2.14	2.18	1.90	1.80	2.18	2.18	1.86	1.80
Dense Linearity (µm)	0.33	0.33	0.35	0.40	0.35	0.35	0.38	0.40
Dense Resolution (µm)	0.33	0.33	0.35	0.38	0.35	0.35	0.38	0.40
0.40 µm DoF @ Full FT	1.05	1.05	0.75	0.60	1.05	0.90	0.50	0.60
0.40 DoF vs CD (µm)	1.65	1.50	1.35	0.90	1.50	1.35	0.75	0.75
0.50 µm DoF @ Full FT	1.50	1.40	1.10	0.60	1.35	1.20	0.90	0.75
0.50 DoF vs CD (µm)	1.80	1.70	1.35	1.00	1.65	1.50	1.10	0.90
0.40 Expo. Latitude (%)	26.2	24.6	14.0	8.0	20.0	22.1	13.2	8.0
0.50 Expo. Latitude (%)	42.8	40.9	34.2	20.5	32.3	34.6	22.1	18.8

Lithographic Performance Summary Table generated for a 0.55 NA, 0.54σ exposure using a 60 sec. single puddle.

Cauchy Coefficients

n_1	1.6463
n_2	$-2.2496+^{e6}$
n_3	$6.3448+^{e13}$

Dill Parameters

Dill A	0.76 µm -1
Dill B	0.05 µm -1

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