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AZ® 5nXT & 15nXT Series

Chemically Amplified Negative Tone Photoresist for Cu RDL and TSV Plating/Etch
TSV: Advantages to Use a Negative Photoresist

Coat positive photoresist

Expose

Develop

Insoluble resist fills via

Insufficiently exposed resist remains in via; Large overexposure may solubilize resist

Unexposed resist remains in via due to insufficient exposure; Overdevelopment does not clean via

Drill/etch hole

Coat negative photoresist

Expose

Develop

Soluble resist fills via

No exposure needed to solubilize resist in via

Clean via for seed layer or plating

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AZ® 5nXT / 15nXT Series

Primarily developed for Cu RDL and TSV definition.
AHR Systems.

AZ® 15nXT covers a larger film thickness range than AZ® 5nXT.

AZ 15nXT-N2
CD = 10 μm
Suss MA 200
Dose: 400 mJ/cm²
Performance of AZ® 5nXT

Substrate: Copper 6”
Process conditions:
FT = 3.5 µm
Softbake = 110°C/120sec contact
PEB = 120°C/60 sec
Exposure: i-line stepper
Development: 3 x 60 sec puddle;
AZ 300 MIF developer @ 23°C
AZ® 15nXT-N1 @ 5μm FT
Resolution and Profiles

5 μm

4 μm

3.6 μm

3.0 μm

2.6 μm
AZ® 15nXT-N1 @ 5µm FT
Exposure Latitude

Substrate = Copper Wafer
FT = 5µm single coat
CD = 5.0µm
SB = 110°C / 120 seconds
Exposure tool = i-line stepper
Dose = 200 - 550 mJ/cm²; F = 1.5 µm
PEB = 120°C / 60 seconds
Develop = 2 x 25 sec puddles, AZ 300 MIF

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AZ® 15nXT-N1 @ 10µm FT
Resolution and Profiles

Substrate = Cu Wafer
FT = 10 µm by single coat
SB = 110°C / 180 seconds
Exposure tool = i-line stepper
Dose = 400 mJ/cm²; Focus = 2µm
PEB = 120°C / 60 seconds
Develop = 2 x 60 sec puddles, AZ 300 MIF
AZ® 15nXT-N1

Performance on Suss MA 200

FT = 15 μm
Suss MA 200 g-h-i
Dose = 1000 mJ/cm²
AZ® 15nXT-N1
Cu Plating Performance

10 µm

8 µm

5 µm
AZ® 5nXT / 15nXT Series
Performance Highlights

AZ® 5nXT

⚠️ For use on Cu type substrates
⚠️ Film thickness range 3 µm – 10 µm
⚠️ Competitive photospeed (400 - 1000 mJ/cm²)
⚠️ Excellent adhesion, no underplating
⚠️ Easy strip (AZ® 400T - 4 min @ 80oC)
⚠️ Very good cost of ownership

AZ® 15nXT

⚠️ Chemistry extension of AZ® 5nXT
⚠️ Less undercut on Cu than AZ® 5nXT at higher film thickness range > 10 µm
⚠️ Can be used as permanent resist
⚠️ Formulation optimization still in progress