Anji Microelectronics Corporation
Introduction

November, 2016
Vision

Microelectronics materials for technology enablement and manufacturing competitiveness through innovation and cost efficiency
Core Competency

- Proven capability and track record in developing new microelectronic materials

- Technical know-how
  - Years of working experience of wafer surface treatment
  - Good understanding of the inter-face science between chemicals and wafer substrate
  - Expertise mfg process, materials science, nano particle engineering, surface science, electrochemistry, metal corrosion control, formulation, etc.

- Design-in Quality mindset
  - Each product going through strict Phase and Gate process to ensure performance, IP, manufacturing, and quality

- HVM capability for chemicals in liquid form (polishing, cutting slurries, stripping/cleaning solutions)
Organization

Shumin Wang
Chairman & CEO
- Co-founder
- Over 15 years of product development, marketing strategy, business valuation, fundraising strategy and general executive management experience in IC industry
- EMBA from Kellogg School of Business Management
- Ph. D in chemistry from Rice University
- 60 U.S. patents
- Published her research work in Science

Yuchun Wang
V.P. of R&D
- Over 20 years of product development and technical support in IC industry
- PhD in Materials Science and Engineering from University of California
- 50 U.S. patents

Arthur Hsu
V.P. of Sales
- Over 20 years of product and sales experience in IC industry
- MS degree of Electronic Engineering in National Taiwan Ocean University

Steven Ungar
CFO
- Co-founder
- Over 30 years successful experience in business growth, new business development, M&A, financing etc.
- Broad experience and depth knowledge of business operation in North America, Europe, and Asia

Joanne Yang
V.P. of GM
- Over 15 years management experience in admin, legal, IT, IP, etc.
- Bachelor of business management from La Trobe University in Australia
- Postgraduate degree at Renmin University in China

Kevin Qi
Operation Director
- Over 10 years' experience in semiconductor manufacturing
- Over 7 years' experience in semiconductor production management.
- Master from Tongji University
Company Milestones

R&D & MFG Facility Setup
2004-2006

China Market Penetration
2007-2010

Global Market Expansion
2011-now

Manufacturing site

R&D center
Core Business

Advanced Wafer Level Packaging
Photo-resist Remover

Entering Mainstream

IC Chemical Mechanical Polishing & Photoresist Stripper

Mainstream

3D TSV, 3D NAND CMP Slurry & Cleaning Solution

New Technology

Liquid/Substrate Surface Treatment
Micro, Nano, Molecular level
Chemical Mechanical Polishing
Photo-resist Remover
Surface Treatment

LED Chip Manufacturing Photo-resist Remover

Market Expansion

Non-semi Precision Surface Treatment
Engaging

BSI, MEMS, Reclaim

Special Application
Value to the Market

- **China**
  - Shorter and further secured supply chain
  - Enhanced service and support
  - Significant CoO reduction

- **Global**
  - Flexible and agile to serve specific needs
    - Partner with leading equipment and other material suppliers to offer solution for new process and technology
  - Focus on the advantage of the supply availability to drive for long term secured supply chain for ultimate cost benefit
Well equipped R&D facilities in China

- 2000 m² R&D facilities
- 4 labs (two chemistry labs, one analytical, and one metrology)
- Three level clean rooms: class 100,000, 10,000 and 100
- Equipped with wet cleaning tools, polishers, etc.
  - 6” – 12” wafer sizes
IP Status

IP Application

- 732 filed by 2015
- 193 granted by 2015

Covers mainland China, Taiwan, Korean, Japan and USA, etc.
Capability - Manufacturing

Newly expanded HVM manufacturing facilities

- 80,000 ft² in Shanghai
- Current Capacity: 500 million gallon per year
- Raw Material Forecast: Inventory is 3 months

Facility in Shanghai
Business Process - Phase & Gate

Phase I
- Project Justification
- R&D
- Alpha sampling
- Gate I

Phase II
- Broad Sampling Pilot
- Production
- Gate II

Phase III
- Commercialization
- (scale-up)
- Gate III

Phase IV
- Continuous Improvement
- Gate IV

Phase V

- Market research
- Technical assessment
- Proj. Definition
- Target
- Resources
- Timeline
- Raw materials selection
- Analytical instruments
- Method development and validation
- IP mapping
- Development
- Alpha sampling
- IP clearance
- Supplier audit & qualification
- Logistics
- Process justification
- Process validation
- Analytical method transfer
- Incoming raw material testing
- Quality training
- Batch record
- QC charts
- Release testing
- Logistics
- Performance improvement
- Quality improvement
- Mfg robustness
- Cost reduction
Anji’s CMP Slurry Supply Status

- Stable production 8+ years
- Cumulated processed wafers >12M (60% 12”)
- 130nm-10nm
- 250+ patent application filed
- 100+ patent granted

- Becoming mainstream supplier in China
- Qualified supplier at Tier I customers
Anji’s Stripper Supply Status

- Market
  - Becoming mainstream supplier in China
  - Qualified supplier at IC, WLP and LED major customers

- Technology
  - um-20nm
  - 100+ patent application filed
  - 50+ patent granted

- Production
  - Stable production 8+ years
  - Cumulated processed wafers >10M
- Multiple products qualified and in production at world leading Foundries and IDMs
- Involved the technology nodes from 130nm – 10nm
- Channels to market established in multiple counties/regions
Summary

- Anji Microelectronics Co. is an energized, fast growing, innovation driven high tech materials company
  - Offering performance enablement and manufacturing competitiveness via innovation and cost efficiency
- Extensively experienced team with advanced development capability
- Well equipped manufacturing facility supported by designed-in robustness
- Multiple products proven in HVM production
- Slated for strong global penetration
Material Supplier Performance management:

- The policy of QCDS in supplier sourcing management
  - Quality: Quality system to insure stable quality providing
  - Cost: Efficient cost analysis
  - Delivery: Capable resource to meet variable requirement
  - Service: Cooperation ability on technical development, and well service on business transaction

- Supplier Performance measurement index (QCDSTAP)
  - Quality, Cost, Delivery, Service, Technology, Assets, People and Process
Product Quality & Reliability Improvement 4-5 Years

- 70% of the product are applied on 12 inch wafers vs. applications only on 8 inch wafer 5 years ago
- 45/40/28 nm product volume production & 14 nm R&D vs. 130/90 nm mature technology product 5 years ago
- Passed worldwide tier 1 customer quality system audits and became the qualified supplier vs. a local supplier to China customers only
Technology/Materials Challenge

- High speed for technology node shrinking- 28nm production become a mature node, focus to put more investments on 14/10 nm product technology development

- No exception to other materials suppliers, Anji faces high challenges of raw materials performance & quality control and superior high standards of manufacturing environment, especially for advanced node products (e.g. the temperature control +/-1C from the raws to final products)

- Less number of the qualified suppliers to meet the advanced node and cost requirements

- More and more performance parameters must be tested at customer product wafers and on-site environment
Anji Photoresist Stripper Portfolio

- Photoresist Stripper
  - IC
    - PERR (Al)
    - PERR (Cu)
    - IDEAL Clean series
    - ICS series
  - WLP
    - Liquid Film
    - Dry Film
    - BPC1xxx series
  - LED
    - ICP/Wet etch
    - Metal lift off
    - BPC3xxx series
  - TSV
    - TSV&RIE stripper
    - BPC2000x
Anji Supply Chain Risk-Short & Long Term

- **Short-Term**
  - Some local suppliers are lack of the mindset for electronics materials market- high standards of product quality control, product performance stability, logistics, customer service, etc.
  - Overall, the suppliers are lack of speed to move with the technology node shrinkage requirements in semiconductor industry

- **Long-Term**
  - Cost elevation for raw materials: operation cost increase for local suppliers or localized international suppliers (JV, etc.)
  - Global economical, political, geographic issues
Concerns

- Not so much an issue to ship materials to China anymore, sometime long lead time is tough
- Less willingness for local suppliers to sell materials to overseas
  - Tax policy change/Regulation policy change
  - RMB depreciation
  - More internal needs from China market
  - Culture difference
  - Tired of attitude to ask for low pricing & high standards from some overseas customers
- Supply chain in China has improved significantly in different aspects, such as materials types/application coverage, quality control, service attitude, etc.; The leaders are meeting the high standards for global customers, and more are following; On the other side, concerns exists as the 2nd bullet
- China fabs need to leverage the geographic advantages to adopt local suppliers
- Fabs out of China need to have a more open view to adopt China suppliers, especially the leading ones
Anji Microelectronics (Shanghai) Co., Ltd.

Thank You

www.anjimicro.com