Applied Varian VIISta® Trident High Current System
The Most Advanced Ion Implantation Solution

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Mobility Growth Drivers

UNPRECEDENTED UNIT VOLUMES

UNITS (MILLIONS)

'11  '12E  '13F  '14F  '15F

315 TABLETS
1,152 SMARTPHONES

5B CUMULATIVE UNITS

Source: Gartner, Applied Materials, UBM TechInsights, Company Announcements

Industry driving high performance and low power chips
Mobility End Markets Require Lower Power...

High-k Metal Gate inflection enables longer battery life

Source: 2012 Anand Lal Shimpi, AnandTech
…and High Performance

Graphics chips are binned for different end markets

Process variability reduces high-performance chip yield

Source: 2009 IEEE Keynote, J. Chen, NVIDIA
Implants for Higher Performance Lower Power

**New implant technology needed for <2xnm devices**
Introducing Applied Varian VIISta® Trident High Current System

Enabling <2xnm transistors

Pure, precise, productive

Builds on industry-standard ribbon beam dual magnet architecture

Extends Applied’s technology leadership in implant market
Key Features Enable Leading Device Performance

Ion source designed for fast tuning of a wide variety of species -- both dopant and non-dopant

Beam Height Modulation delivers precise dose rate control, tailoring doping profile

Uniformity Enhancement Module (UEM) improves low energy beam profile uniformity

Horizontal & vertical angle control enables precise steering and angle spread

Energy Purity Module eliminates high-energy outliers

Cryo-implant enhances device performance through full amorphization

Tightest process variation with low-temperature capability
Best in Class Energy Purity Control

EPM for Foundries with various product designs

Concentration (cm$^{-3}$) vs. Depth (nm)

EPM Eliminates Energy Contamination
Best in Class Energy Purity Control

EPM Eliminates Energy Contamination

EPM for Foundries with various product designs
Damage Engineering Solution
Process Temperature Control II

Traditional Implant

EOR Loops

PtC II for improving device performance & process margin
Damage Engineering Solution
Process Temperature Control II

PTC II for improving device performance & process margin
Cryo-Implant Enables Full Amorphization

Colder is better → less defect → better leakage reduction
Advanced Transistors Expanding Process Applications

Complexity increasing the served market opportunity

~2x INCREASE

Implant
Epi, Thermal, Metal Gate

Node

Fab Step Counts

0 25 50 75 100

65nm 40nm 28nm 20nm
A Decade of Implant Product Leadership

>1000 SYSTEMS INSTALLED

Applied is the industry’s partner-of-choice for Implant

*Through May 2012
Applied Varian VIISta® Trident High Current System

Enables <2xnm transistors

Highest purity with superb uniformity enhancing device performance yield

Unique -100°C implant enables higher device performance

Continuing implant leadership for the next decade