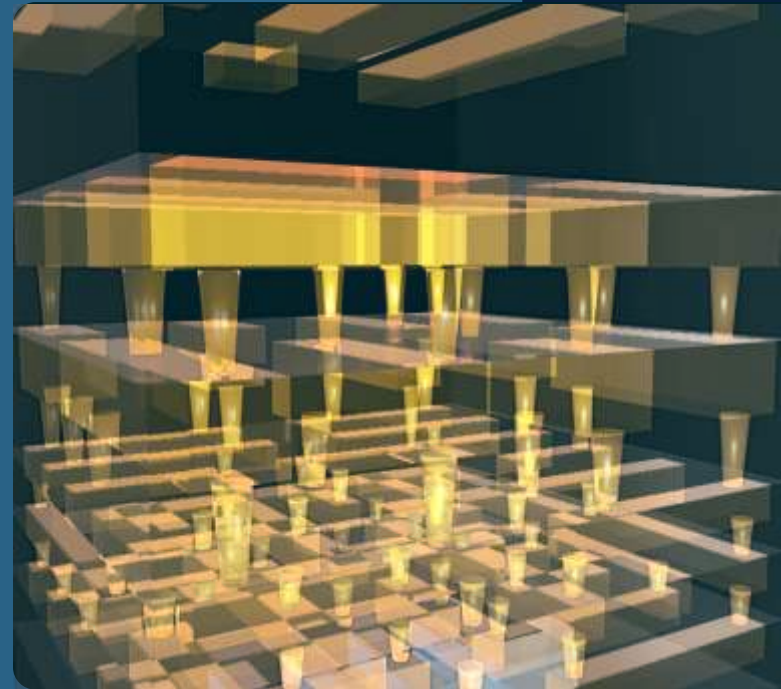




Black Diamond[®] 3 PECVD System

Silicon Systems Group

July 12th, 2011



Safe Harbor

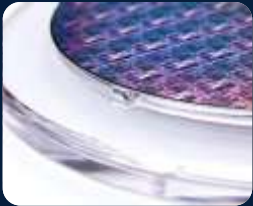
These presentations contain forward-looking statements, including those regarding market outlooks; technology roadmaps; the proposed Varian merger; and Applied's market positions, products, growth opportunities, strategies and business outlooks. These statements are subject to known and unknown risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statements, including but not limited to: the level of demand for Applied's products, which is subject to many factors, such as uncertain global economic and industry conditions, demand for electronic products and semiconductors, government renewable energy policies and incentives, and customers' new technology and capacity requirements; the satisfaction of conditions precedent to the proposed merger with Varian, including the ability to secure regulatory approvals in a timely manner or at all; Applied's ability to (i) develop, deliver and support a broad range of products and expand its markets, (ii) align its cost structure with business conditions, (iii) successfully execute its acquisition strategy and realize synergies, (iv) obtain and protect intellectual property rights, and (v) attract, motivate and retain key employees; and other risks described in Applied's SEC filings. All forward-looking statements are based on management's estimates, projections and assumptions as of July 12, 2011, and Applied undertakes no obligation to update any forward-looking statements.

New Products Released At 2011 Semicon West

TRANSISTOR-ENABLING PRODUCTS



Reflexion GT™ for Tungsten



Vantage® Vulcan™ RTP

Centura® DPN HD



Endura® Versa™ XLR W PVD

Endura® HAR Cobalt PVD

Centura® Integrated Gate Stack



Producer® Black Diamond™ 3

Producer® Nanocure™ 3



INTERCONNECT-ENABLING PRODUCTS

Low-κ Leadership for the Next Decade

Producer Black Diamond 3 and Producer Nanocure 3

REQUIREMENTS
OF LOW-κ FILM

Electrical

Mechanical

>150

DOWNSTREAM
PROCESS STEPS

Lower capacitance

Lower power consumption

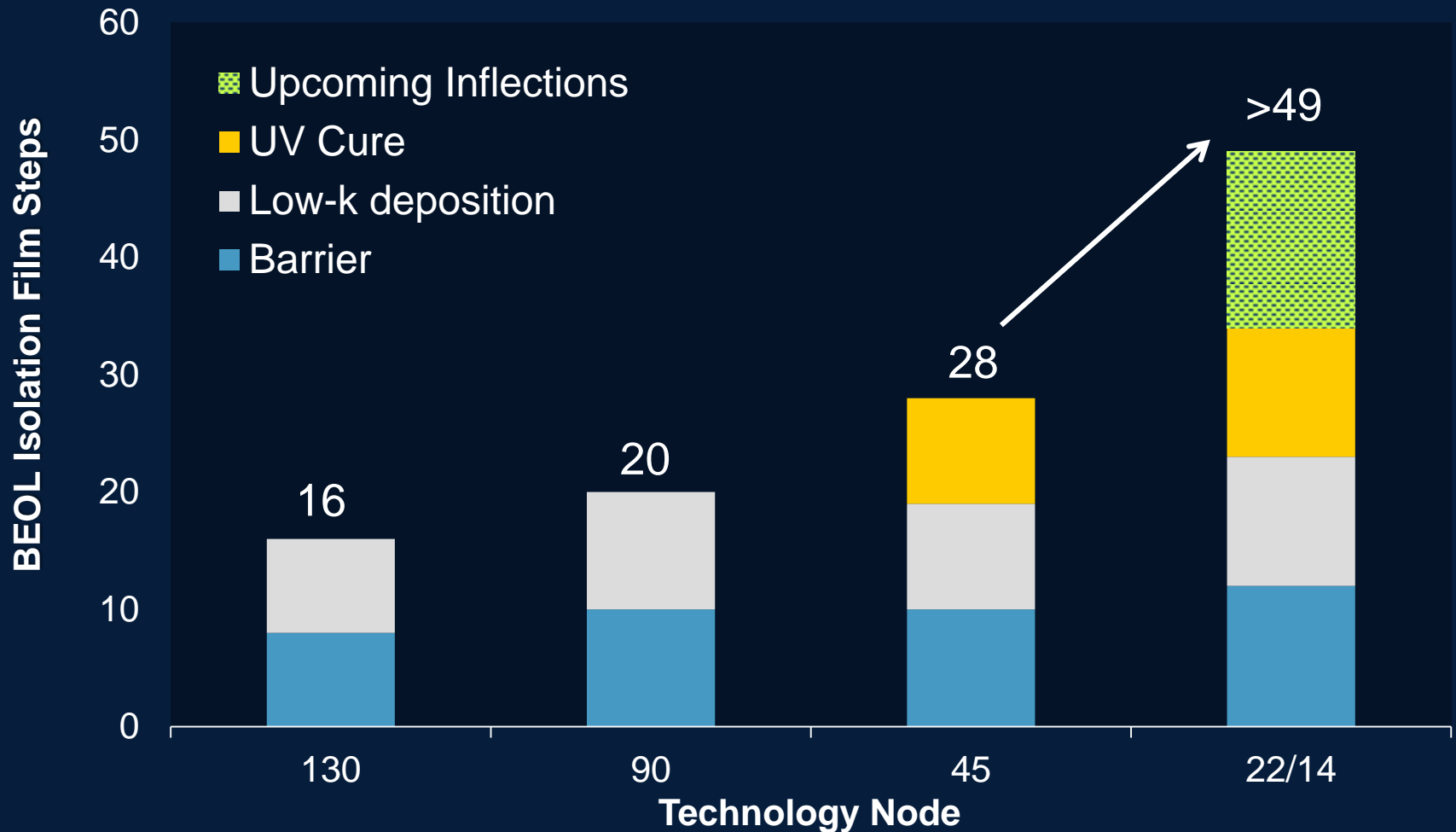
Higher mechanical strength

Packaging yield

Uniform curing

Less device variability

Advanced Interconnect is a Growing Inflection

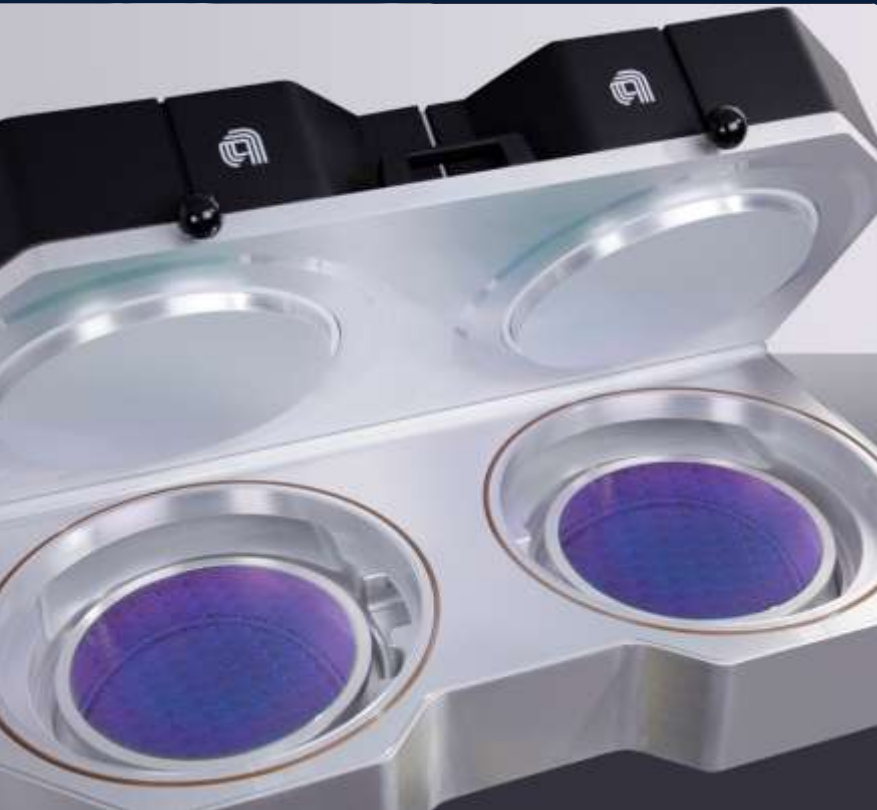


Served Available Market Opportunity ~\$500M

Source: Gartner 2011 market size data for IMD films + cure

Low-k Leadership For The Next Decade

Producer Black Diamond 3 And Producer Nanocure 3



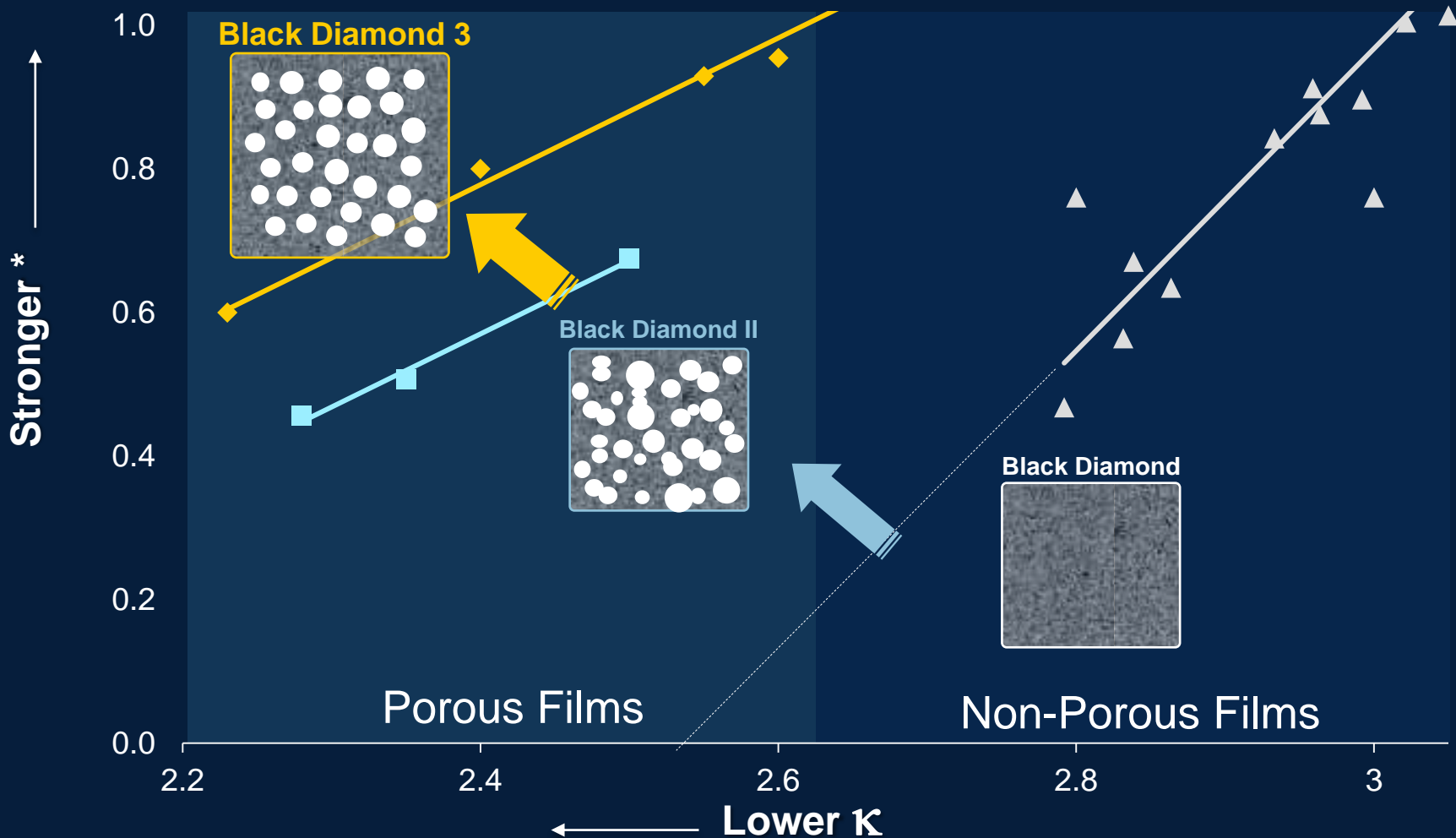
Higher mechanical strength
Packaging yield

Lower capacitance
Lower power consumption

Best-in-class uniformity
Less device variability

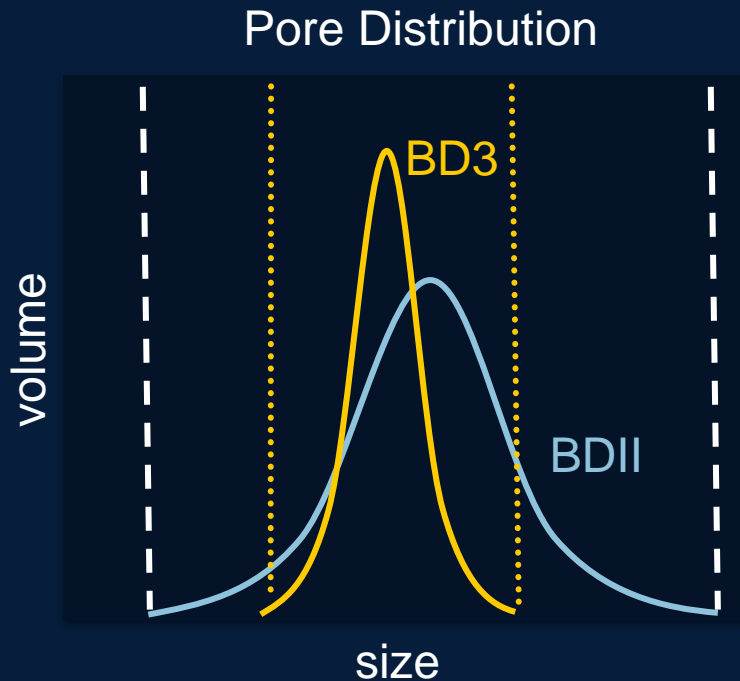
Porosity Engineering

Higher Strength with Lower κ



* Normalized Young's Modulus

Strength Enabled by Patented Chemistry



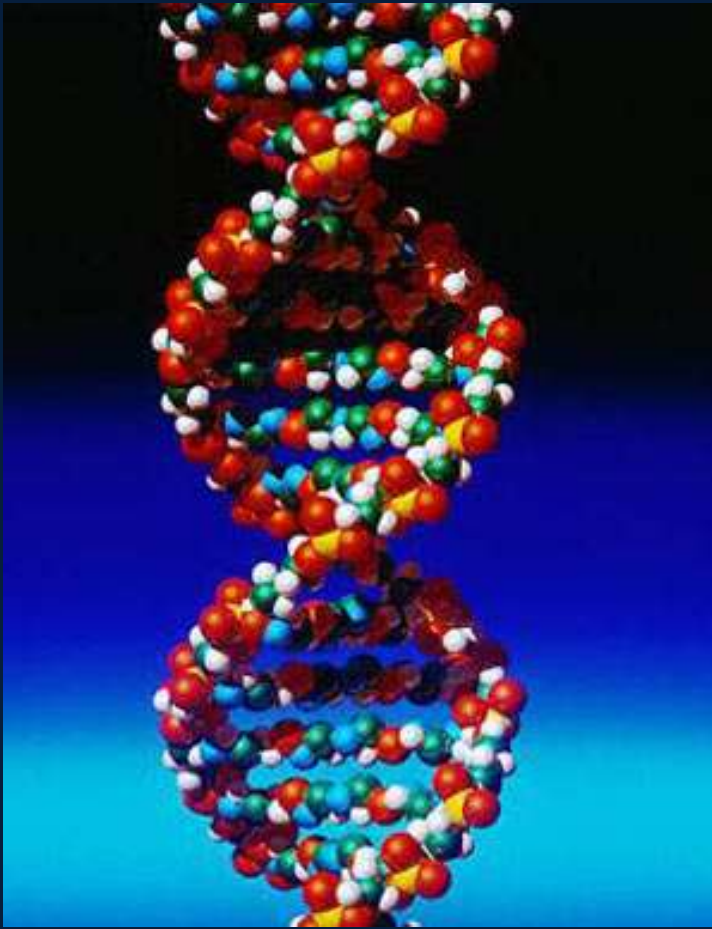
Better isolation with
engineered porosity

Less interconnected,
more uniform pores

Ordered structure from
designer chemistry

How Small Is a Nano Pore?

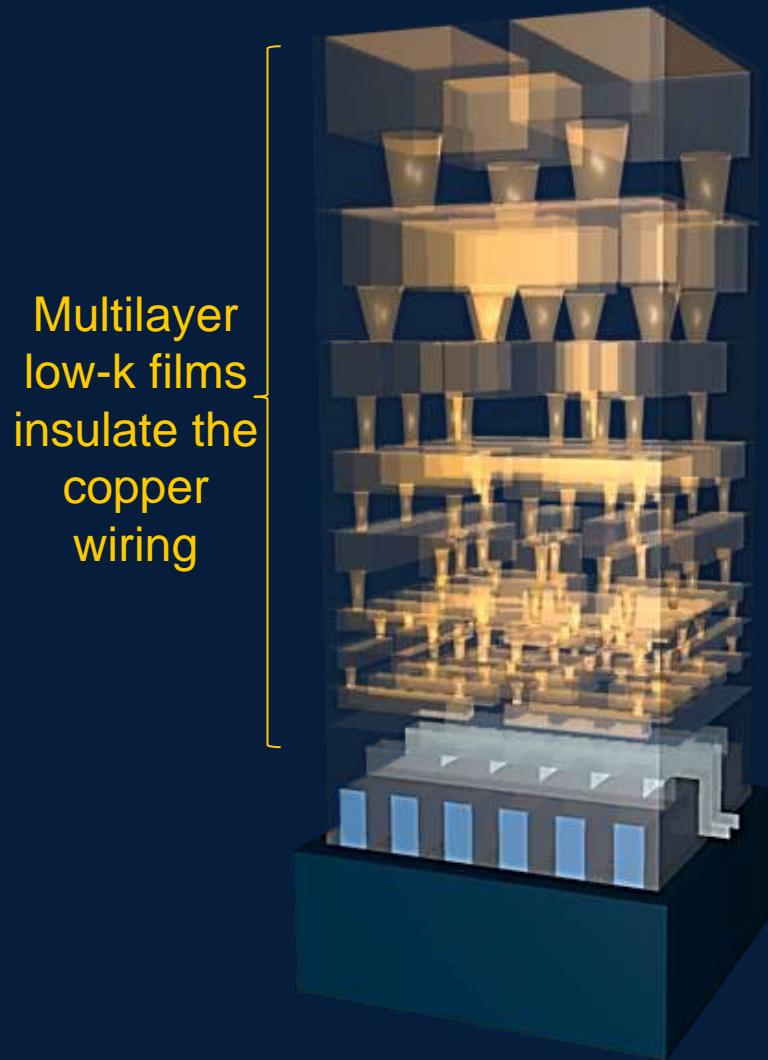
A Human DNA Strand



A nanometer sized pore is **half** the width of a DNA strand

Black Diamond 3 film is engineered on the inside with nano pores

Lowering Interconnect Power Consumption



Interconnect power is

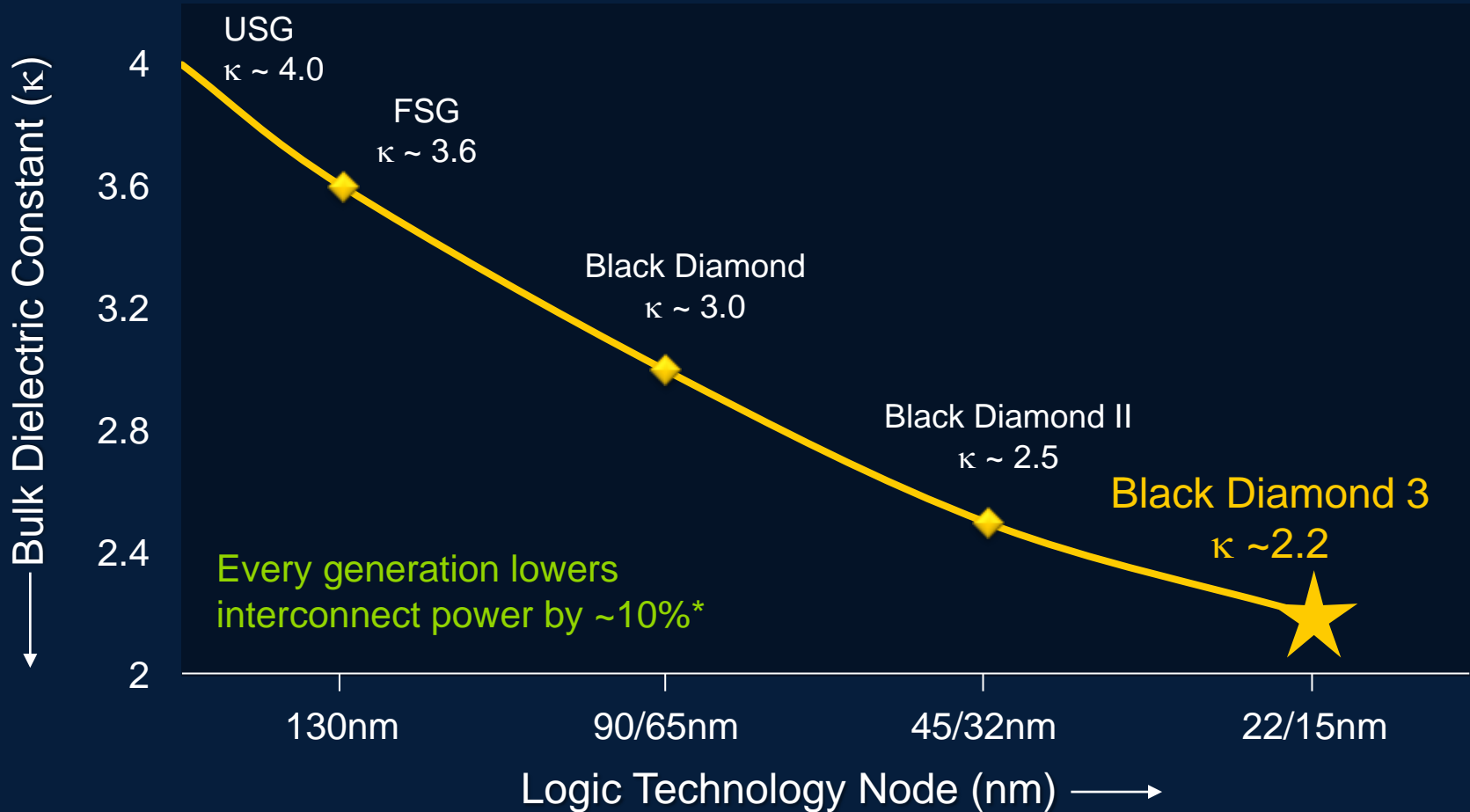
$$\sim \frac{1}{3}$$

of total chip power consumption*

Lowering the dielectric constant, κ , improves insulation and lowers device power use

Source: Chandra, G.; Kapur, P.; Saraswat, K.C.; "Scaling trends for the on chip power dissipation"

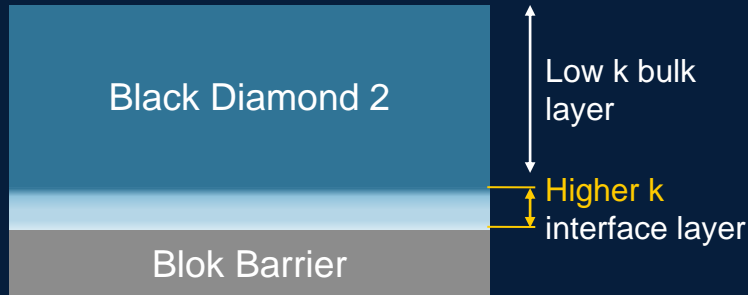
Generations of Low-κ Technology Leadership



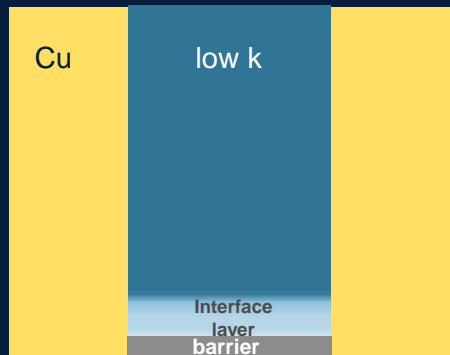
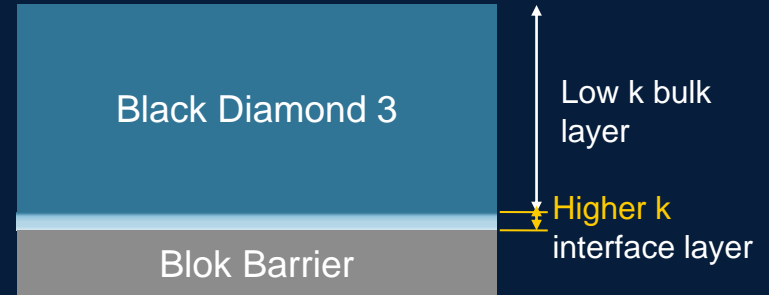
*Source: Tada, M.; Inoue, N.; Hayashi, Y.; , "Performance Modeling of Low- κ /Cu Interconnects for 32-nm-Node and Beyond

Interfacial Engineering Offers Lower Effective k

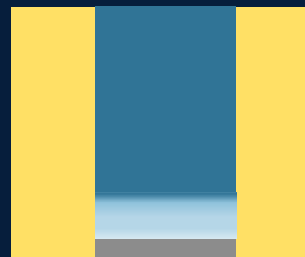
Interface Layer (before)



Thinner Interface Layer (now)



45/40nm



32/28nm



22/20nm

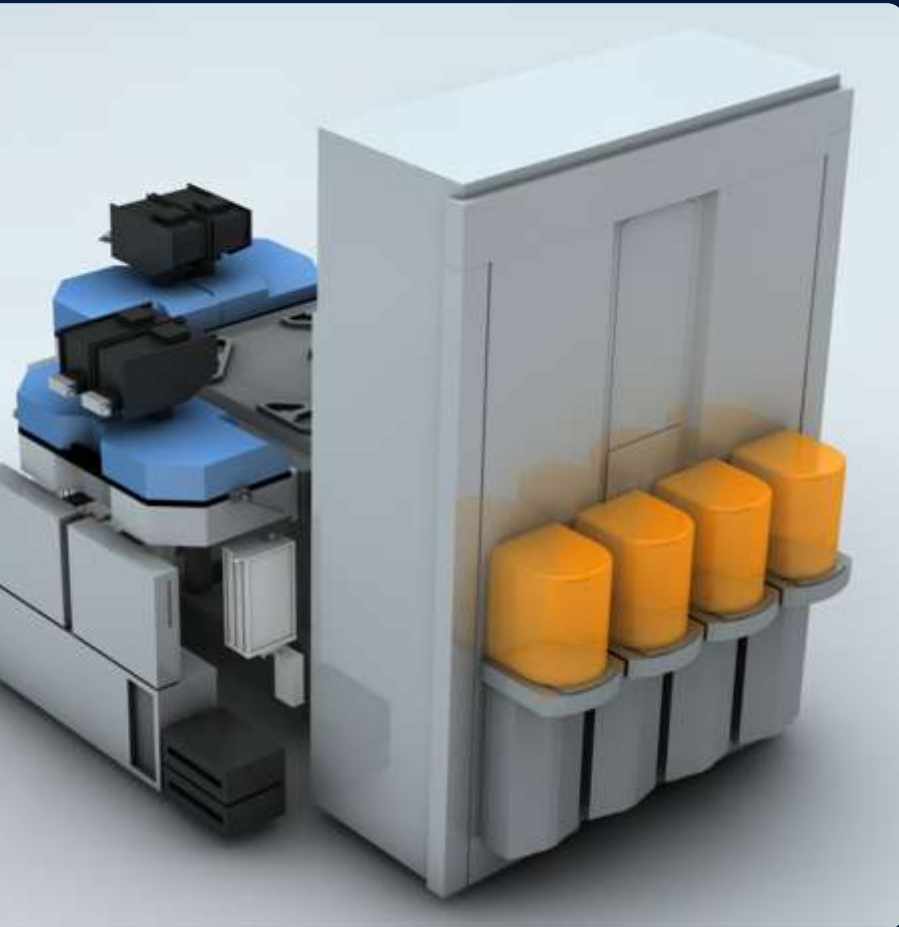


15/14nm

Interface layer is scaling to smaller device nodes enabled by Black Diamond 3

Black Diamond 3 With Nanocure 3 UV

Expands Leadership in Low-k Dielectrics



Engineered porosity offers higher mechanical strength for chip packaging yield

Extreme low κ dielectric ($k \sim 2.2$) lowers power consumption

Thinner interface layer offers lower k for smaller device nodes



Turning innovations
into industries.™