

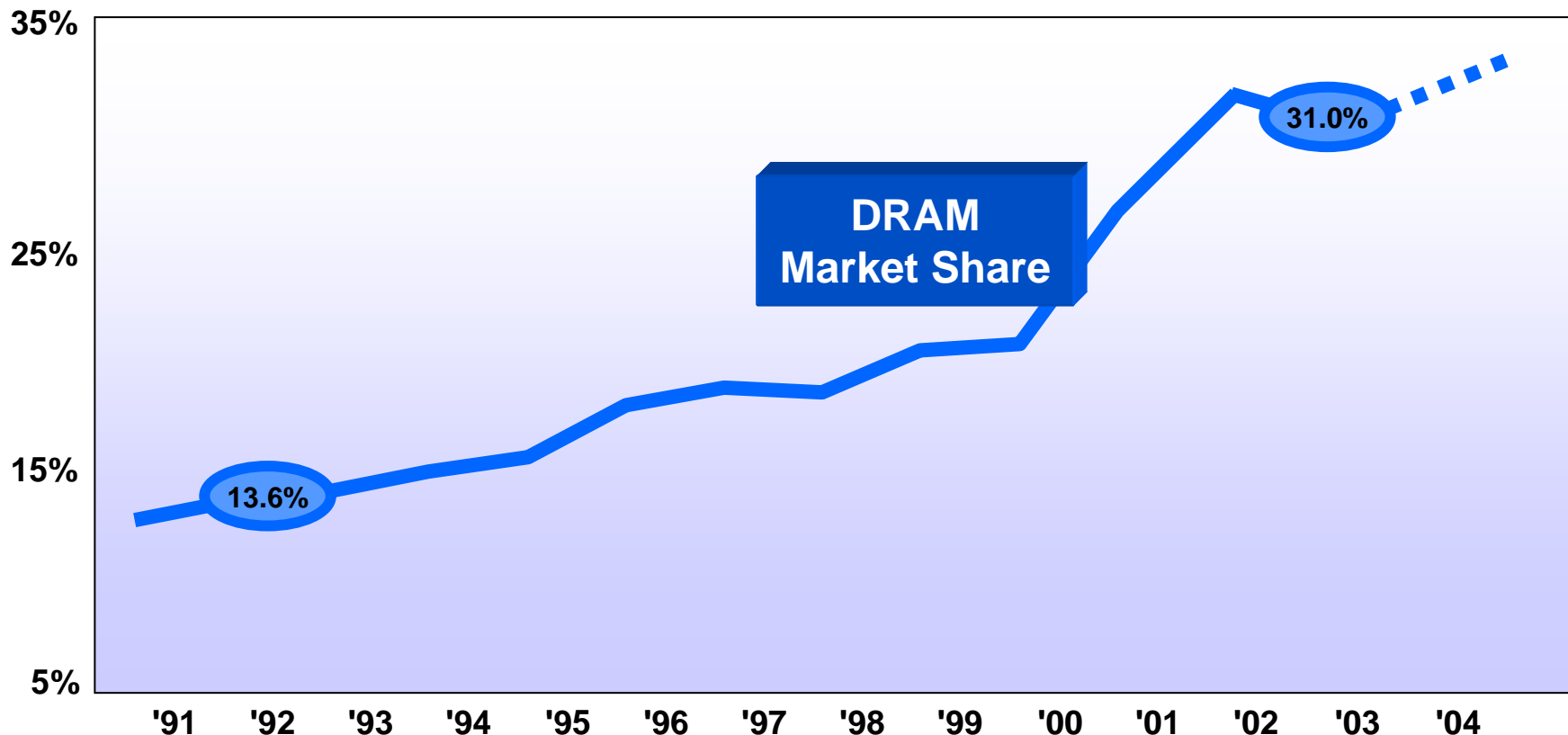
# **DDR2 Memory Update**

**September 7<sup>th</sup> 2004**

**Nathan Handelsman  
Product Marketing  
Samsung DRAM Marketing**

# Samsung DRAM Market Share

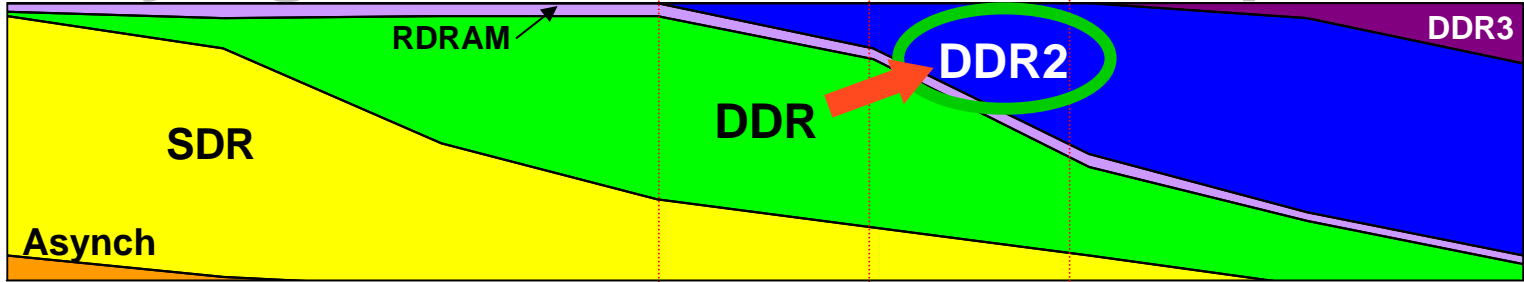
DRAM Market Share  
(Revenue-Based)



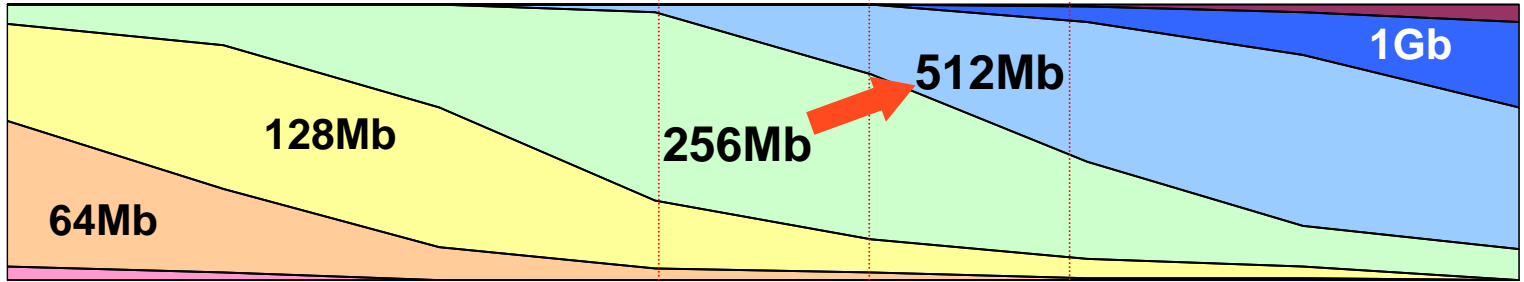
“First In, Last Out” market strategy...

# Staying in the DRAM "Sweet Spot"

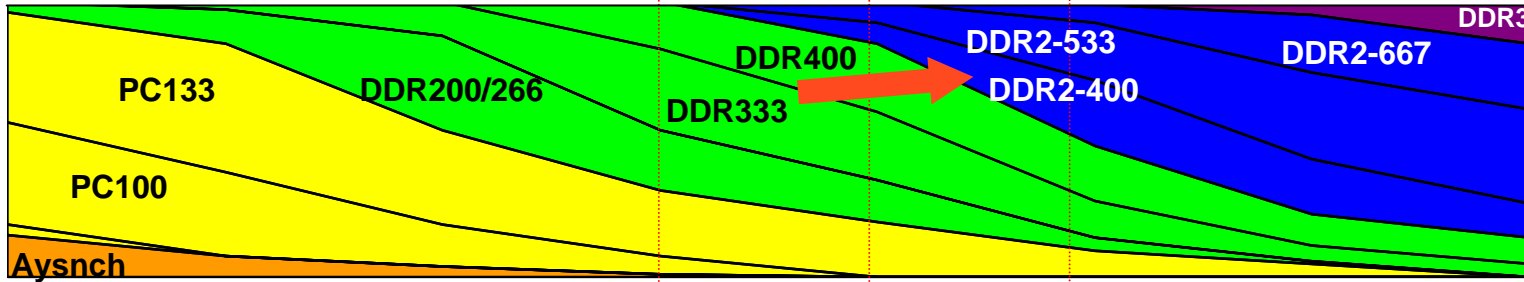
**Technology**  
2~3 Years



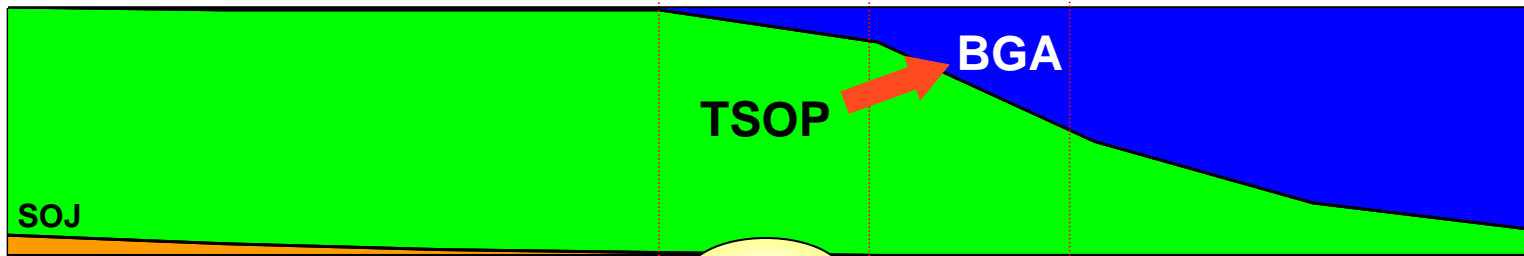
**Density**  
1.5~2 Years



**Speed**  
< 1 Year



**Package**  
5+ years



2001

2002

2003

2004

2005

2006

2007

# DDR2 vs DDR: Key Feature Comparison

Category	DDR	DDR2	DDR2 Benefits
Data Rate	200~400Mbps	400~667/800 Mbps	Higher system performance
Voltage	2.5V, 2.6V @ 400Mbps	1.8V	Lower power consumption + better thermal characteristics → faster speeds and higher capacities
Termination	On Motherboard	On Die	Better signal integrity, Real estate savings on motherboard
Chip Package	TSOP	FBGA	Better electrical characteristics
Pins / DIMM	184pin DIMM	240pin DIMM	Support for differential strobes → Better margins, higher frequencies

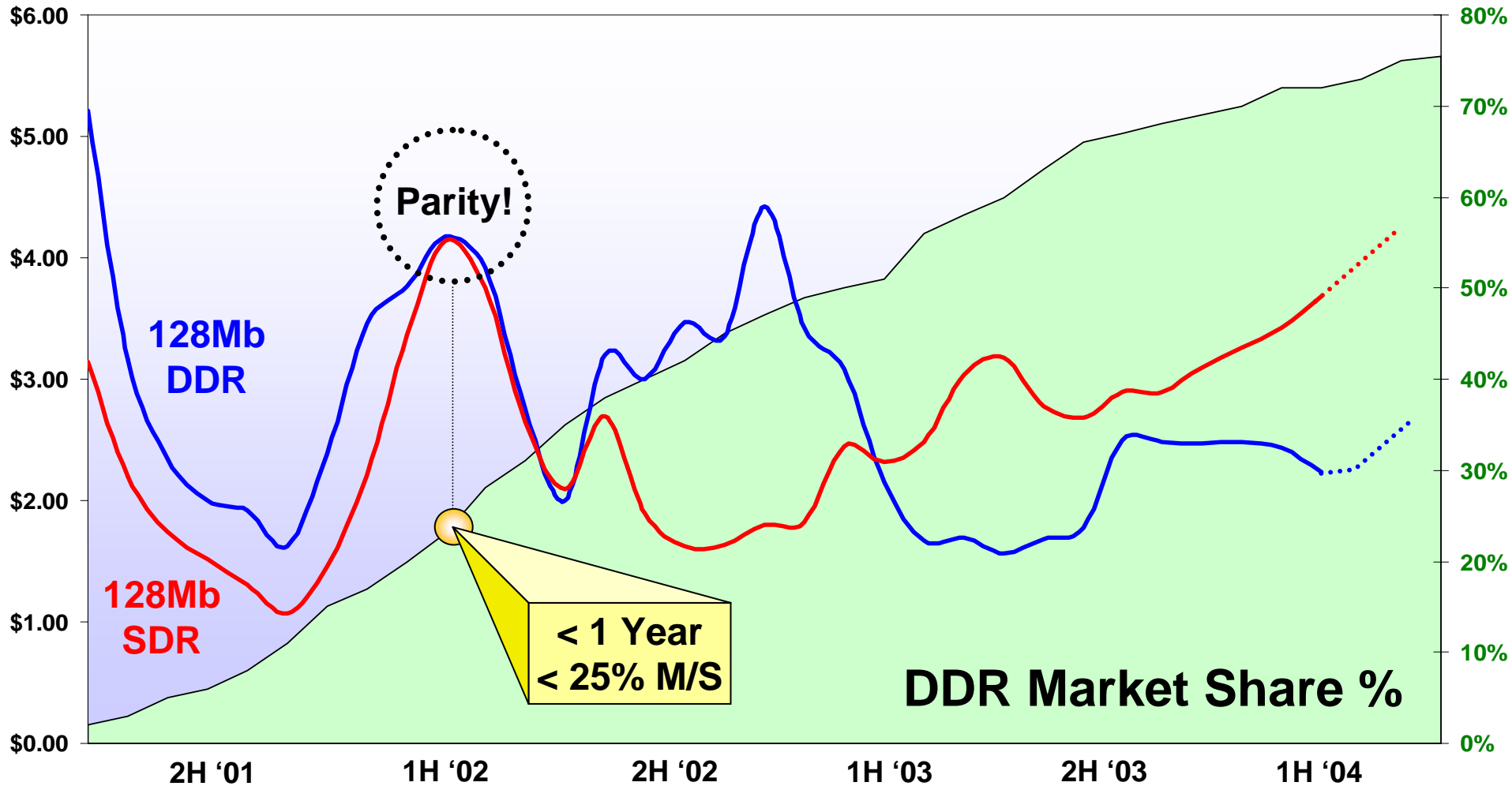
**DDR2 Net Benefit: Better System Performance**

# When Will DDR2 Hit Price Parity with DDR?

## Historical Analysis of SDR → DDR

Spot Price

DDR %



Launch

Ramp Up

Mainstream (Market Driven Price)

SAMSUNG

ELECTRONICS

# DDR2 Pricing: A Self-Fulfilling Prophecy



## Bullish Attitude:

“Embrace technology improvements”

Maximum adoption rate

Drive supply-side increases, prices fall



## Not-So-Bullish Attitude:

“Wait and see approach”

Minimal adoption rate

Supply increases slowly, pricing is higher

## “Only” 2.5 Months After DDR2 Launch:

Sub \$1,000 PC's are appearing with DDR2

Mainstream consumer applications migrating to DDR2

DDR2 will continue to proliferate; no commercial barriers...



## Dimension 8400

Cutting Edge Performance  
with High-End Video

- Pentium® 4 Processor 530 with HT Technology (3GHz, 800 FSB)
- Microsoft® Windows® XP Home Edition
- 512MB Dual Channel DDR2 SDRAM at 400MHz (2x256M)
- FREE (3-5 Day) Shipping on orders over \$999 - Online Only!
- FREE 2nd Bay DVD-Burner!
- FREE Dell Printer offer ends Wednesday!

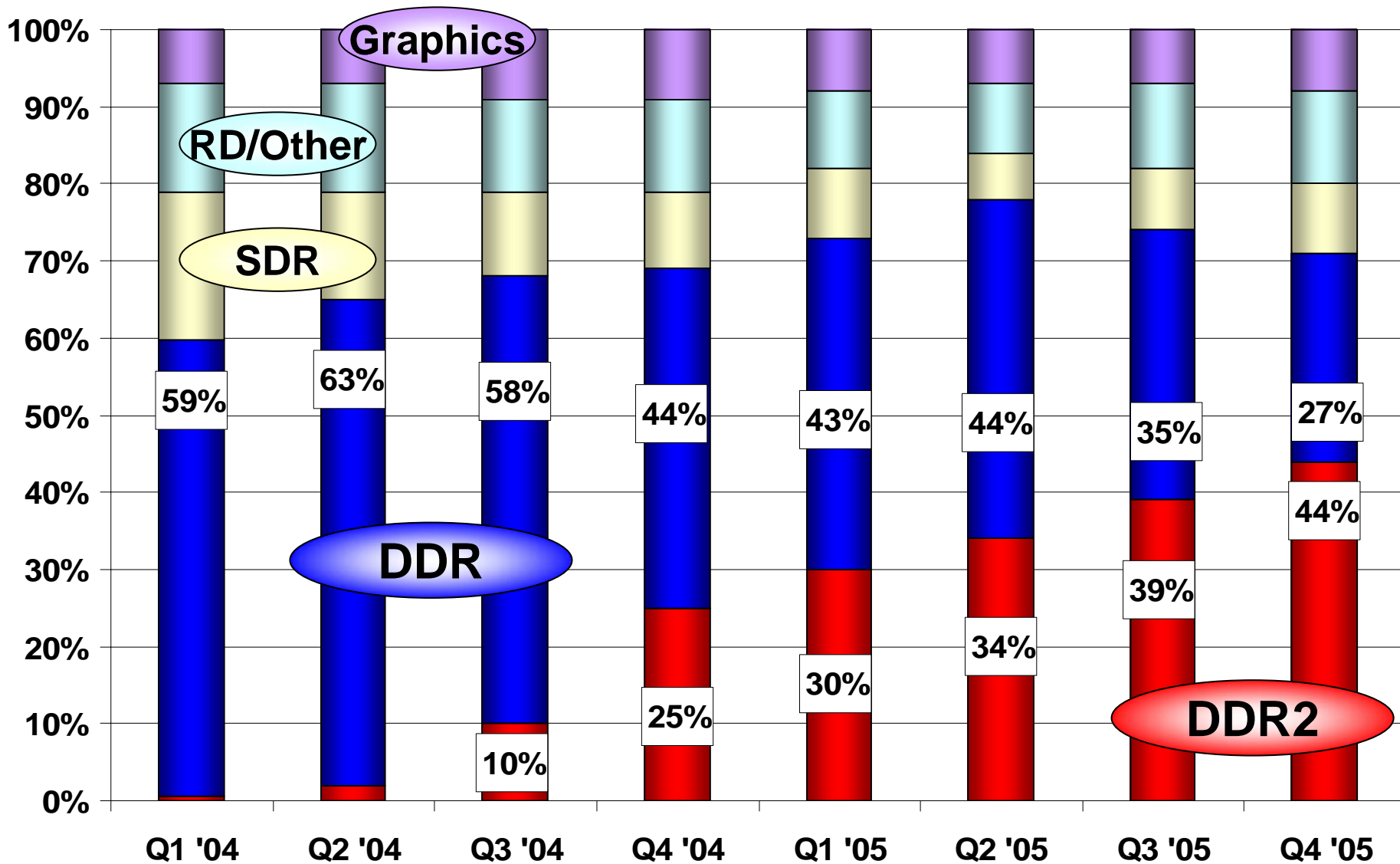
Featured at

~~\$1,099~~

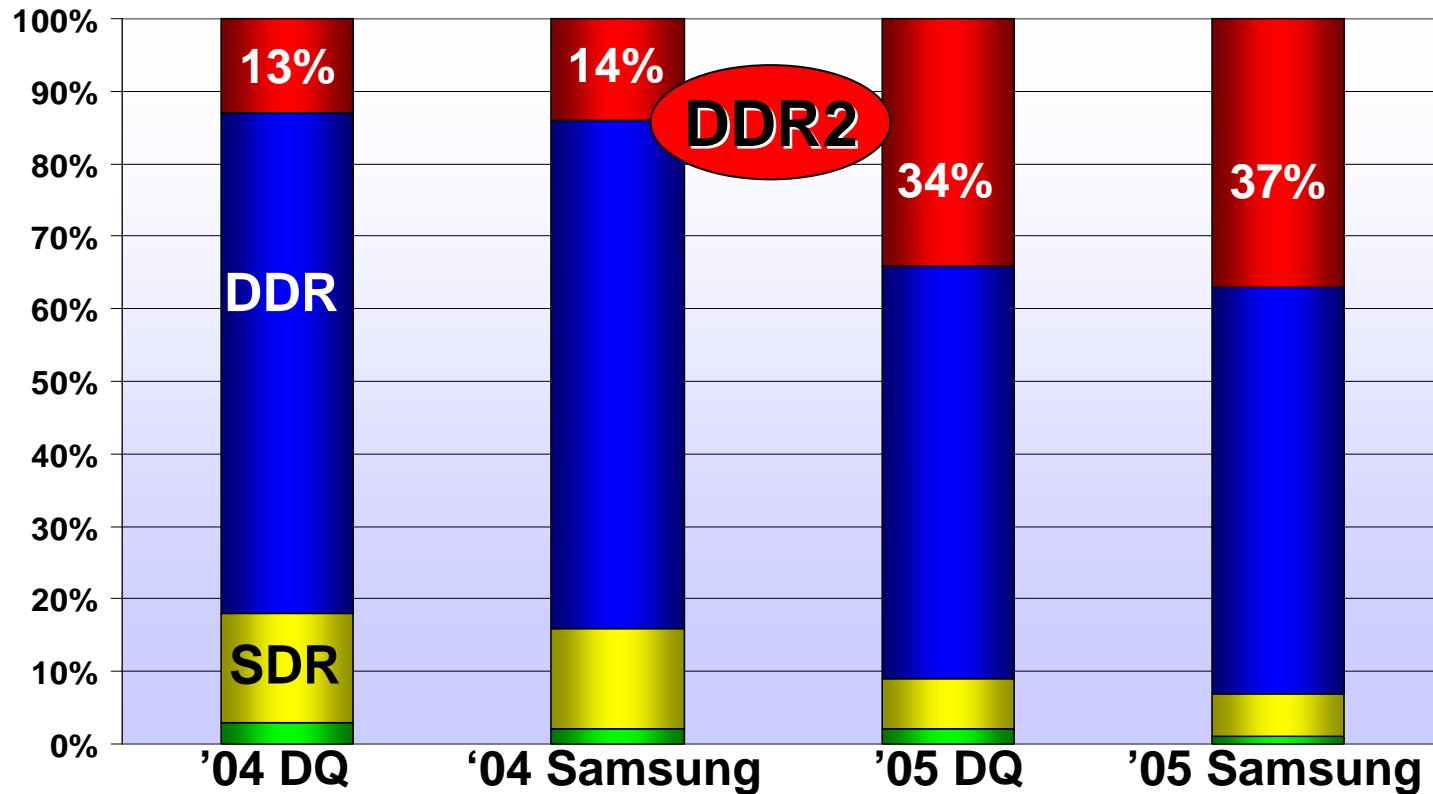
**\$899**

After \$200 OFF Instantly

# Samsung DRAM Production Plan

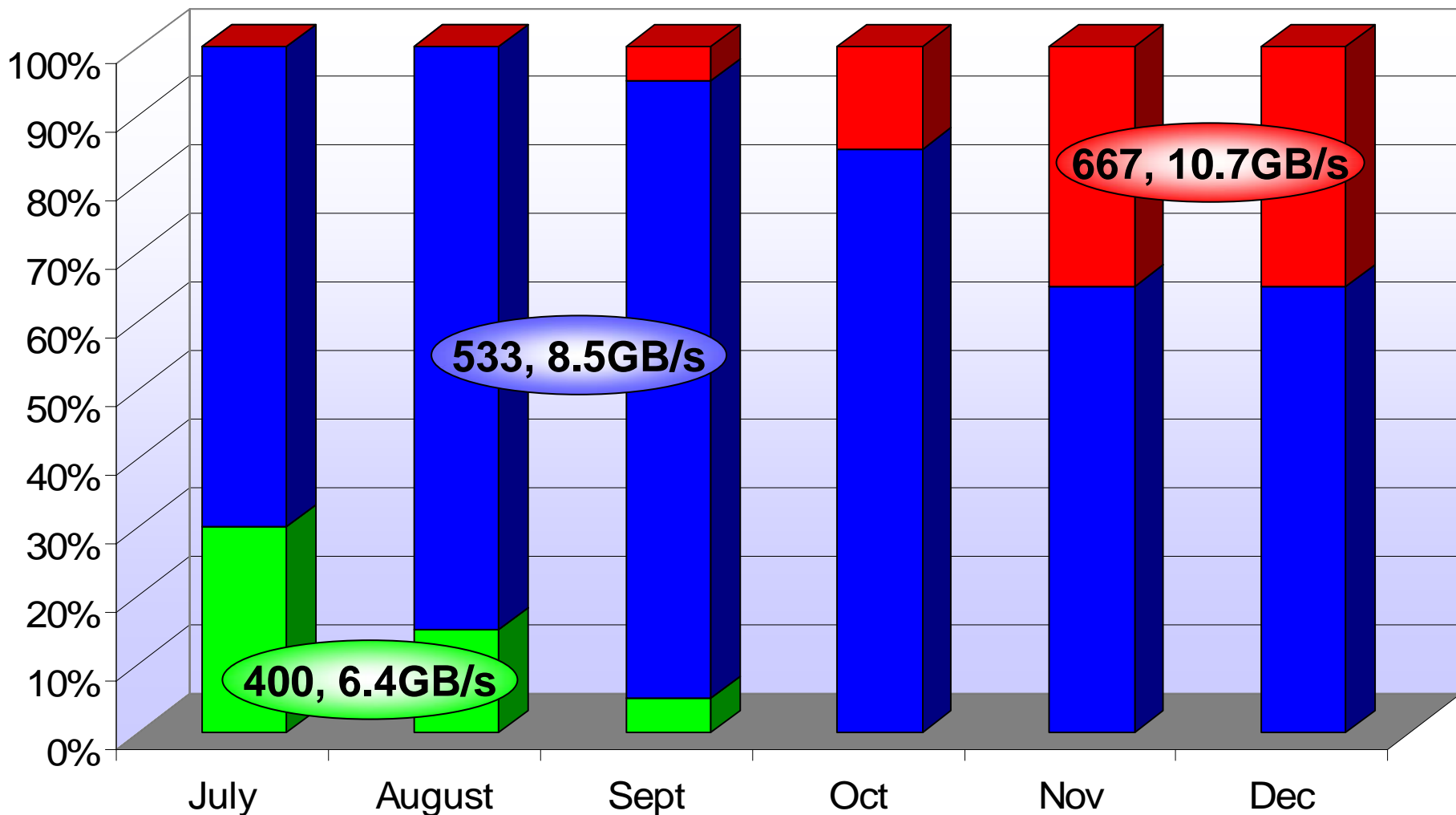


# WW DRAM Demand Forecast



- ❑ DDR2 share in Q4 2004 will exceed 18-20%
- ❑ Servers, hi-end D/T and mobile to adopt DDR2 aggressively
  - ❖ Corporate and mid range D/T are DDR2 volume swing factors

# Samsung DDR2 Speed Bin Yield



Ready for 667...

# Samsung DDR2 Solutions Roadmap

Market / DIMM		Year	2003		2004			
			Q3	Q4	Q1	Q2	Q3	Q4
Server:	256/512MB,1GB							
	2GB							
Reg DIMM	4GB							
	512M~ 2GB							
FBDIMM								
Desktop & W/S: UDIMM	256MB - 1GB							
	2GB							
Notebook: SO-DIMM	256MB, 512MB							
	1GB							
	2GB							

DDR2 is Ready: All DIMMs and Market Segments

# Concluding Thoughts

- ❑ Industry is prepared for DDR2
  - ❖ Chipsets, motherboards, system vendors
- ❑ Samsung is prepared for DDR2
  - ❖ Fully validated; production infrastructure already in place
- ❑ Samsung's DDR2 transition will be fastest ever
  - ❖ No competing DRAM technology this time...
  - ❖ SDR → DDR: ~2 years. DDR2: 5 Quarters to exceed DDR
- ❑ PC / IT Replacement Cycle is Underway
- ❑ Why complement robust new platform features with old memory technology?
  - ❖ “Wiser to buy *up* technology curve than *down* cost curve”