



## THINnovation: Powering Consumer Electronics

Samsung HDD Solutions for  
Today's Thin Computing

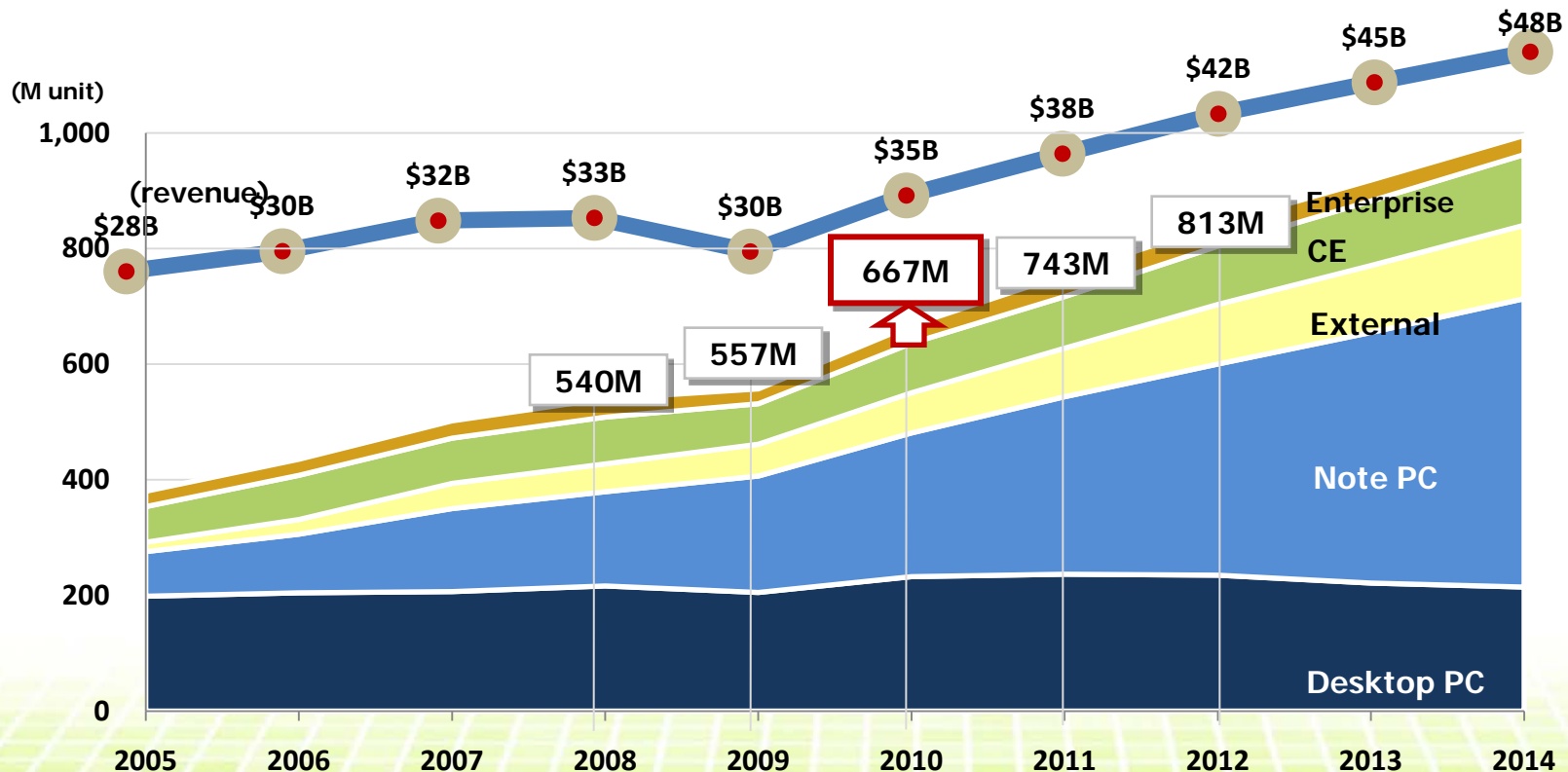
# HDD Market Outlook

- '10 HDD Market : Estimated at 667M units

- Increased by 10% from Dec '09 Forecast, 605M units

- ✓ Note PC HDD Growth : 201M ('09) → 498M ('14) (CAGR 20%↑)

- ✓ External HDD Demand rises : 55M ('09) → 127M ('14) (CAGR 18%↑)



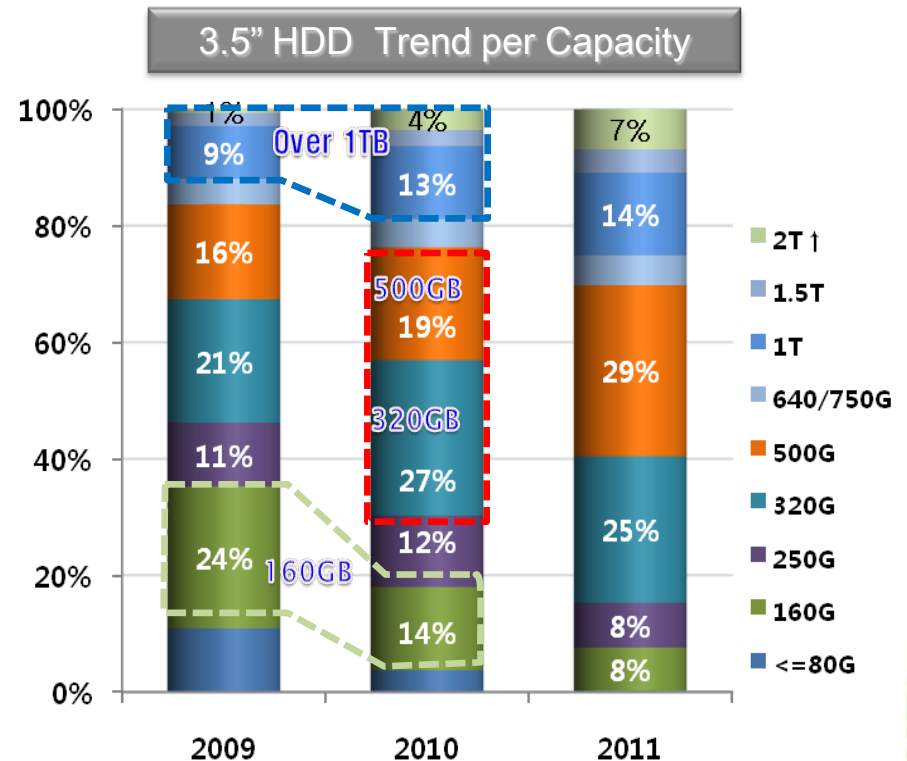
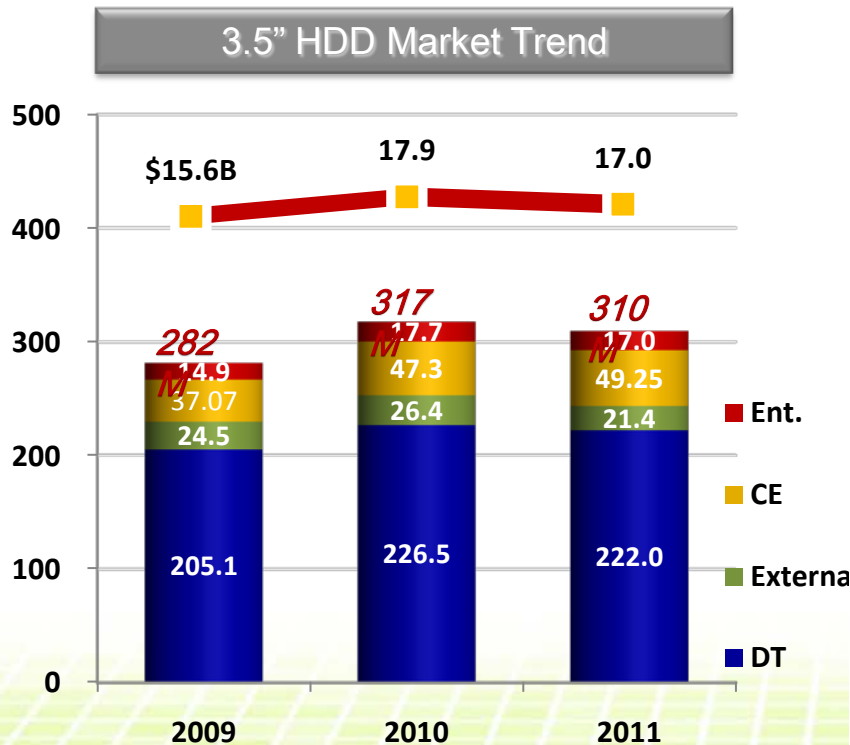
# 3.5" Market Outlook

## 3.5" Demand Recovers in 2010

- Steady DT Demand
- Strong Set-Top-Box Demand Growth in US & Europe

## Mainstream Capacity in 2010 is 320GB & 500GB

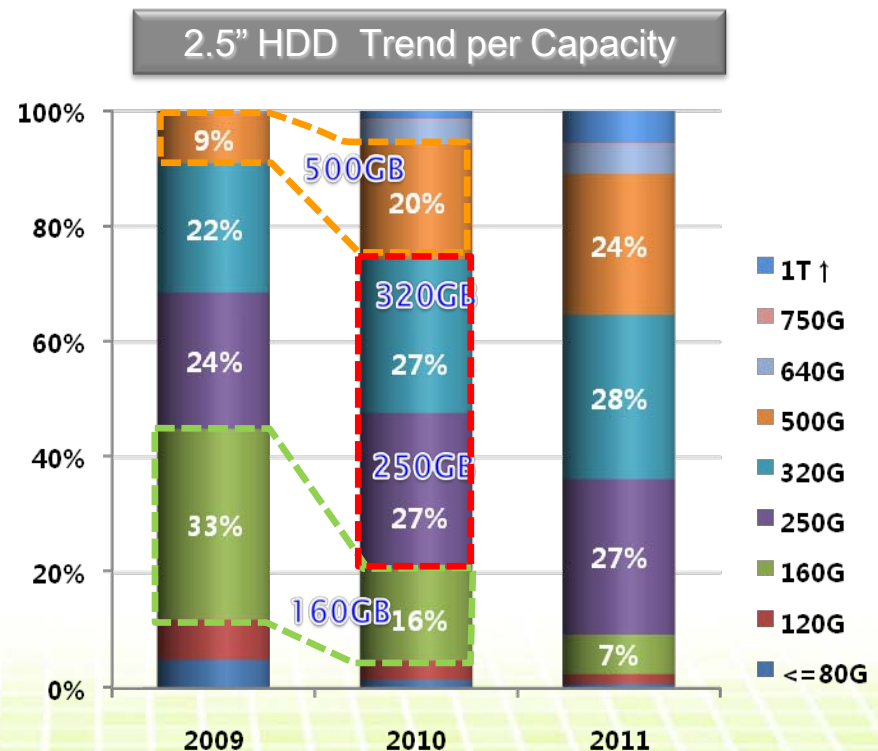
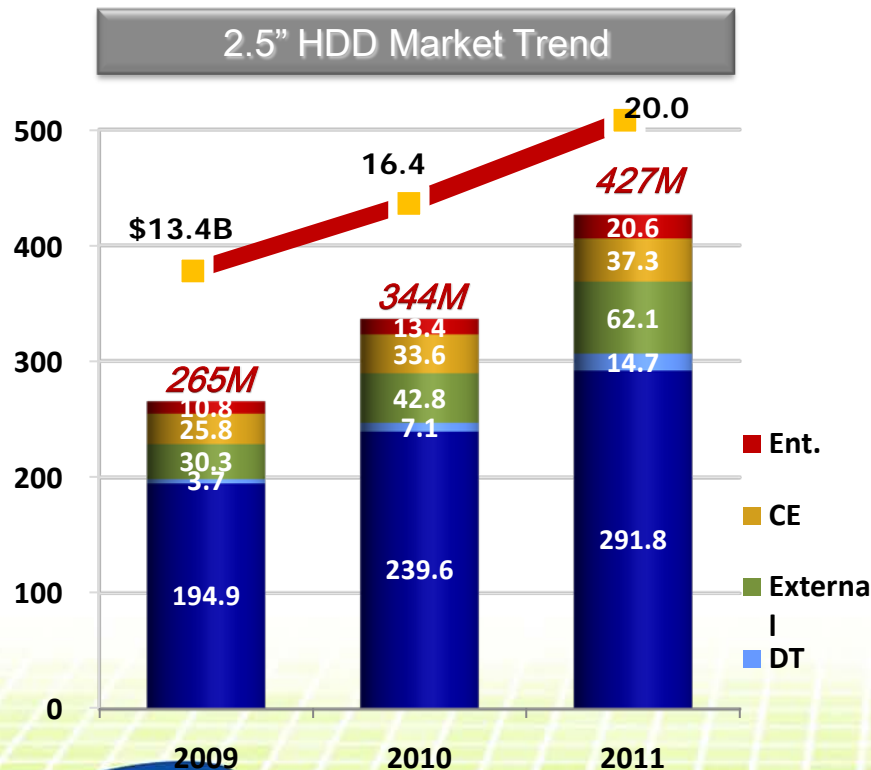
- Above 1TB Attach Rate Increases in Desktop & External HDD



Source: TrendFocus 02.'10 & SEC Marketing

# 2.5" Market Outlook

- '10 Strong 2.5" Growth Momentum
  - Strong Sales of Notebook drives 2.5" HDD Market Growth
  - Personal Storage Demand Growth Continues
- Biggest YoY Growth is 320GB & 500GB

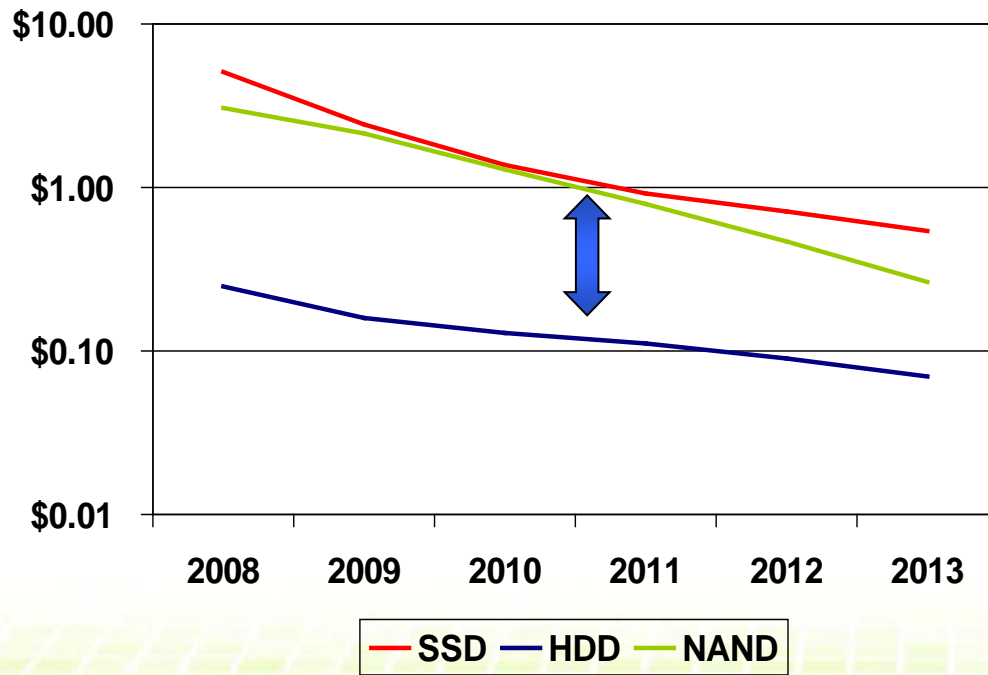


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# Still Most Economical Storage: HDD

- HDD is the most cost effective solution for high capacity need.
- High capacity availability in 2011
  - ➔ 2.5" : 2TB (3D) / 3.5" : 4TB (4D)

HDD vs. Flash [Price(\$)/GB]



## Mobile Storage in 2011



2TB

**More than 200 full HD movies**

## Home Data Storage in 2011



4TB

**Huge Space for all family !**

# New Product Introduction: F4 Internal Drive

F4 delivers robust features, superior performance and superb reliability with lower power consumption for desktop computers



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# 3.5" Products Solution

F4

F4EG-3

## ❖ F4 Family Product Overview

	<b>Low Capa Solution!</b> F4	<b>Low Capa Eco Model!</b> F4EG	<b>2TB-ECO Solution!</b> F4EG - 3
Max.Capacity (GB/p)	320GB <b>(667GB/p)</b>	320GB (667GB/p)	<b>2TB</b> (667GB/p)
RPM	7.2Krpm	<b>5.4Krpm</b>	5.4Krpm
Buffer	8 / 16 MB	16 MB	32 MB
Disk	<b>1</b>	1	3
Head	<b>1</b>	1	6
Start Stop	CSS	CSS	CSS
SoC	Solaris 3	Solaris 3	Solaris 3
Market	OEM PC, Disti PC	CE	External HDD

# F4 Products Overview

F4

F4EG-3

✓ The **New F4 desktop** drives from SAMSUNG delivers the **Main Volume Solution** for **low Capacity** for desktop drive with advanced areal density technology. (640GB/p)

## ❖ Key Feature and Benefits

- Mainstream Capacities from 250 to 320GB
- High Performance & Superb Reliability
- Advanced Areal Density Technology (640G/p)
- Halogen-free design for eco-friendly
- Reduce Power Consumption & Acoustic Noise



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# F4 Key Specification

F4

F4EG-3

HD322GJ (320GB)

SPECIFICATIONS		
Capacity	250GB~320GB	
RPM	7,200 RPM	5,400 RPM
Buffer	8 / 16 MB	
Interface	SATA 3.0Gb/s	
Areal density (avn)	347 Gbits/inch <sup>2</sup>	
RELIABILITY		
Start/Stop Cycles	50,000	
Annual Failure Rate	1.46	
Unrecoverable read errors	< 1 error in 10 <sup>15</sup> bits	
ACOUSTICS		
Idle (Typ)	2.6	
Seek (Typ)	2.8	
SHOCK		
Operating Shock (max)	70G/2ms	
Non-operating Shock (max)	350G/2ms	

PERFORMANCE	
Average Seek time (Typ)	8.9 ms
Average Latency	4.14 ms
Drive Ready Time (Typ)	8.0 sec
Data Transfer Rate	300MB/s
Power Requirements	
Spin-up Current	2.0 A
Seek (Typ)	6.2 W
Read/Write (Typ)	6.1 W
Idle (Typ)	4.3 W
Standby (Typ)	0.8 W
Sleep (Typ)	0.8 W

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# F4EG-3 Products Overview

F4

F4EG-3

✓ The **New F4EG-3 desktop** drives from SAMSUNG delivers the **2TB 3Disk Solution** **Eco-Green drive with** for desktop drive with advanced areal density technology.

(667GB/p)

## ❖ Key Feature and Benefits

- Mainstream Capacities from 1.5TB to

2TB

- Better Reliability (fewer Head)
- Advanced Areal Density Technology
- Environment Friendly Drive
- Superb sector with 512 Emulation

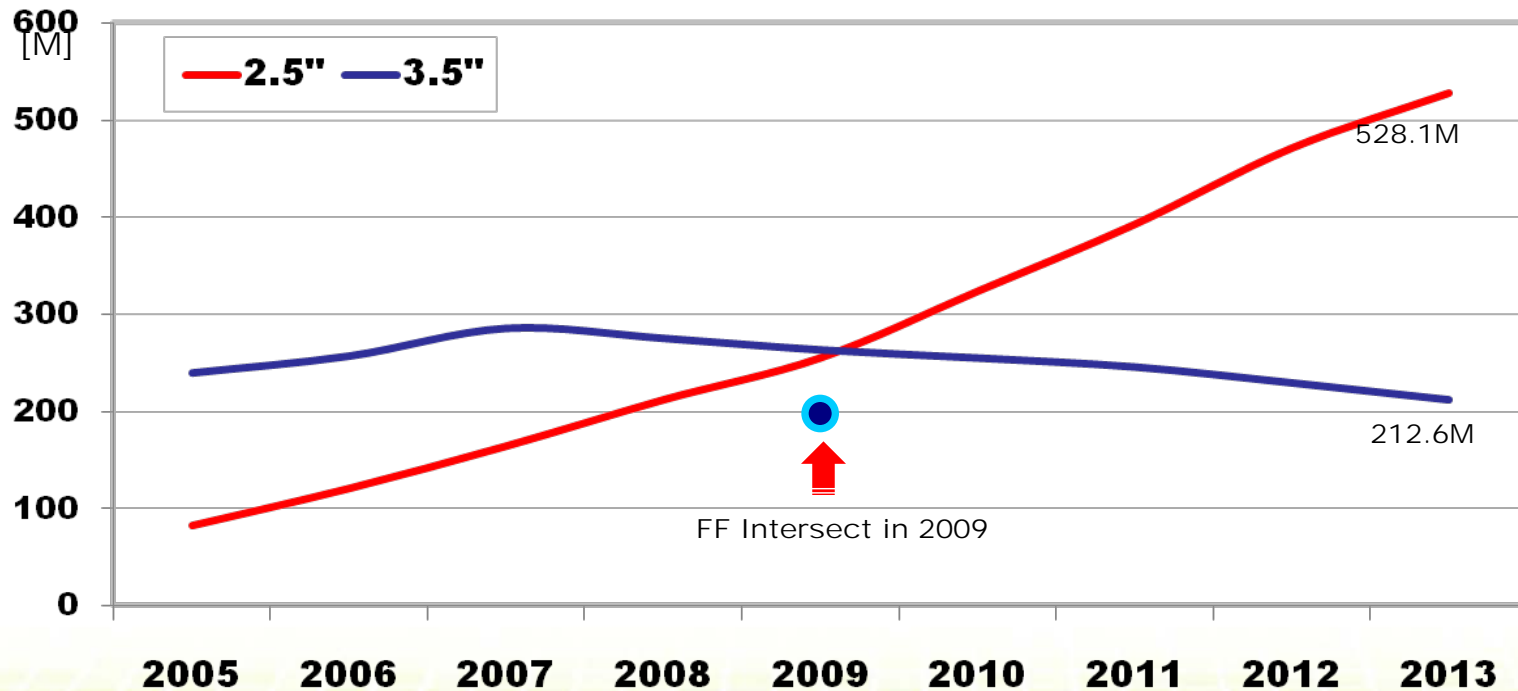


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# Market Shift : Desktop → Mobile

- 2.5" - 3.5" cross-over in 2009.
- Driven by strong notebook PC sales in 2009.



[ Source : IDC ]

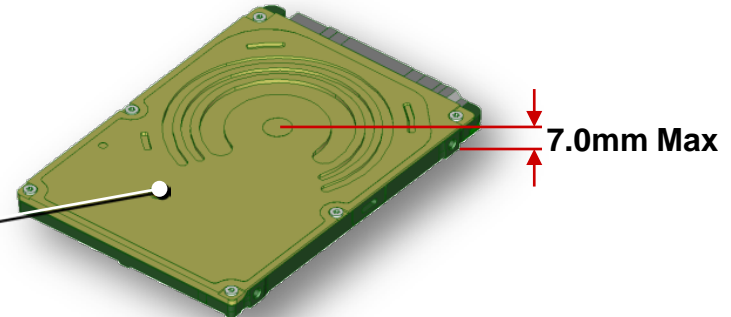
# 2.5" Platform evolution

- Various platforms (1D/2D/3D) to meet demanding customer needs □



# M7ELP for Ultra Thin

Provide more flexibility  
for slim system design



Length, Width, Side mount hole,  
Connector position are same as  
2.5" 9.5mm Height

Optimal Storage Solution  
For Ultra Thin

- 1disk dedicated platform
- Capacity : 320GB, 250GB
- Rotational speed : 7200RPM
- Cache size : 16MB
- 7mm thickness
- CQU availability : `10.Q4

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# 1TB Solution for mobile : 2.5" MT2

- Highest Capacity "1TB" for External HDD
  - : Enough Capacity to satisfy space hungry users
- Easy to use, handle it
  - : Don't need power cable, only connect USB cable



**Experience real Mobile 1TB !**

## Key Specification

Capacity (GB)	▪ 1TB, 750GB
Interface	▪ SATA 3.0Gbps
Cache (MB)	▪ 8MB
Spindle Speed (RPM)	▪ 5400rpm
Shock : OP 2ms / NOP 1ms	▪ M7E Equivalent
Acoustics : Idle/Seek (Bel)	▪ M7E Equivalent
Operating Temperature (OP/NOP)	▪ 5~55°C / -40~70°C

*What's your choice for 1TB?*

3.5" 1TB



2.5" 1TB



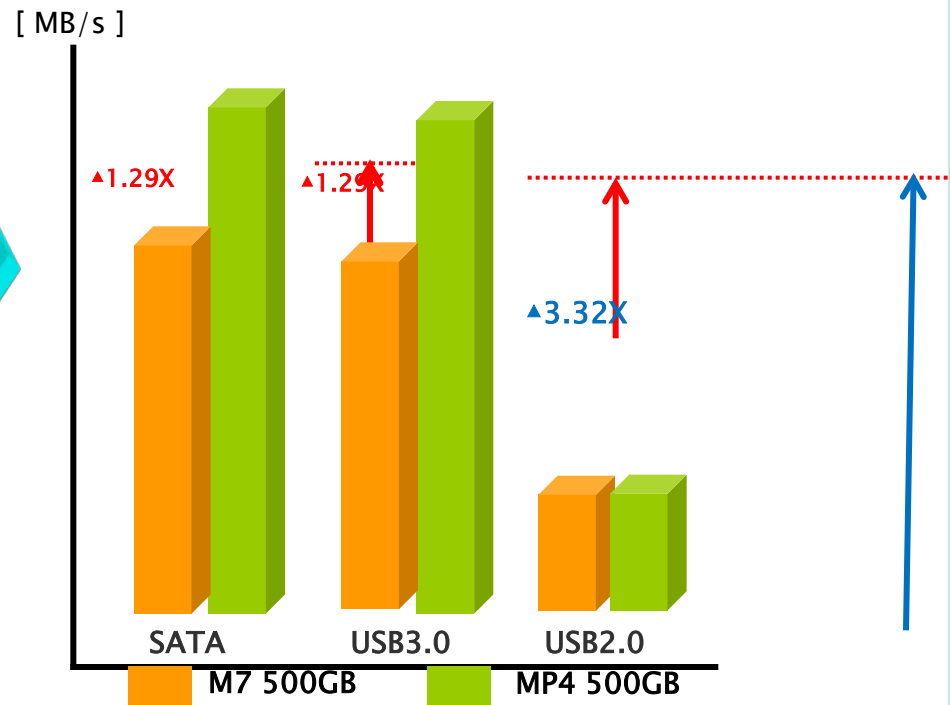
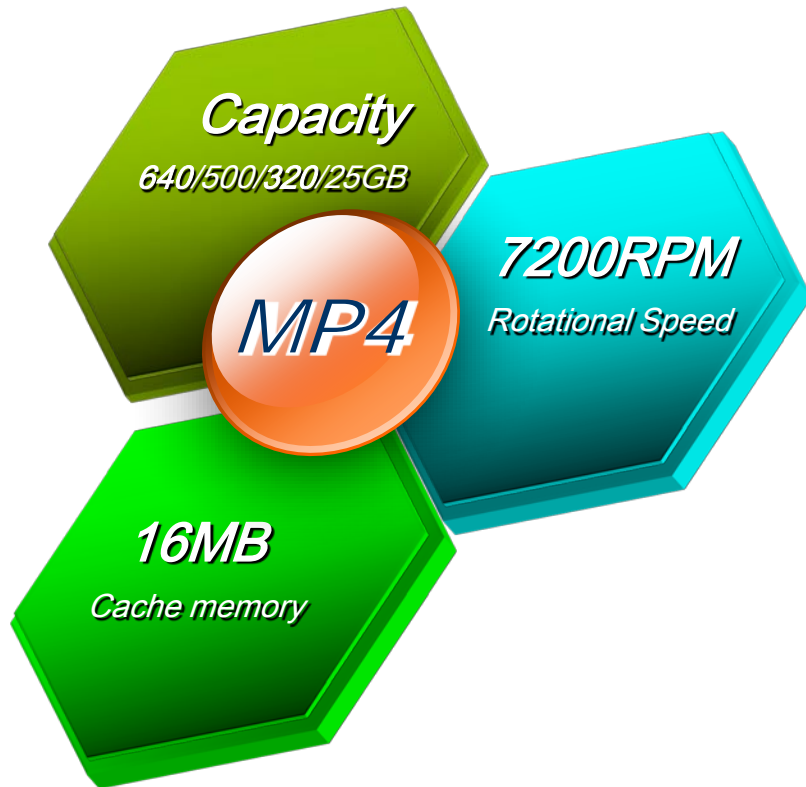
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# High Performance for mobile : 2.5" MP4

- Maximize performance for mobile device
- Suitable for performance NBPC / slim DT / USB3.0 external storage : 7200rpm provides **30% performance** increase over 5400rpm

## Desktop-class performance mobile 7200rpm HDD



[Sequential Read, Sandra 2009 test result]

# Key Takeaway

- The F4 delivers:
  - Robust features
  - Superior performance
  - Lower power consumption

....for desktop solutions



**Questions?**