



Intel Solid State Drives (SSDs)

What are SSDs?

- SSDs are solid state drives, that use NAND non-volatile flash memory (they retain information when not powered)
- Solid state means that they have no moving parts, and thus offer many advantages over traditional magnetic media:
 - **Sturdy:** *the risk of mechanics failure is near zero*
 - **Silent:** *no moving parts means that they operate noiselessly*
 - **Energy Efficient:** *they require far less power to operate than traditional disk drives, and generate far less heat*
 - **Responsive:** *no read/write head to move — no spin-up time reduces access time*
 - **Fast:** *seek time is constant, with no dependence on the physical location of the data.*

Expert included.



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SLC or MLC?

SLC	MLC
<ul style="list-style-type: none">• SLC or “Single Level Cell”• Appropriate for high performance but less cost-sensitive applications• Stores one bit-per-cell of information, resulting in a reduction in errors• Smaller capacity, but performance is enhanced by faster write speeds, higher reliability and lower power usage• Appropriate for high transactional applications requiring high reliability, increased endurance and viability in multi-year product life cycles	<ul style="list-style-type: none">• MLC or “Multi Level Cell”• Appropriate for use in “read heavy” environments, lower performance and attractive cost-per-bit applications, as well as OS drive use• Stores two or more bits of information per cell• Offers larger capacity than SLC• Appropriate for consumer products: multi-function cell phones, digital cameras, USB drives

Expert included.



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How do SSDs compare to HDDs?*

<i>Enterprise HDD</i>	<i>Intel High Performance SSD</i>
180 Write IOPS	3,300 Write IOPS
320 Read IOPS	35,000 Read IOPS
146GB	32GB
Cost per IOPS: \$2.43	Cost per IOPS: \$0.09

**These figures are approximate.*

Expert included.



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Which SSD is right for my environment?

Feature	Intel MLC SATA SSD	Intel SLC SATA SSD
Form Factor	1.8" and 2.5"	2.5"
Capacity	80GB, 160GB	32GB, 64GB
Reliability	1.2M Hour MTBF	2.0M Hour MTBF
Usage Case	36.5 TB written Up to 20GB/day (2x for 160GB) for 5 years	Up to 700 TB written More than 350GB/day (2x for 64GB) for 5 years
Write Throughput	70 MB/s	170 MB/s
Read Throughput	240 MB/s	240 MB/s
Lifetime	Endurance managed to guarantee 5 year life	Lifetime dependant on usage, no performance limitations
SATA Features	3.0Gbps, NCQ, Hot-Plug, DIPM, Write Cache	

Expert included.



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Product Decoder

X 25-E 160 GB

Drive Size
25 = 2.5"
18 = 1.8"

Drive Capacity
32 = 32GB
64 = 64GB
80 = 80GB
160 = 160GB

Technology (Market)
E = SLC (Enterprise)
M = MLC (Client)

SLC = Single Level Cell NAND Flash
MLC = Multi Level Cell NAND Flash

Expert included.



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Contact Silicon Mechanics

For answers regarding SSD selection,
contact one of the Experts at Silicon Mechanics:

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Expert included.