

2.5" SATA 840L-D Enterprise SSD

(SQF-S25Cx-xxxGDSCC)





Uncompromised Reliability

Reliability of a system is seldom wholly satisfying. One of the major variables is the storage device. The Advantech 840L-D 2.5" SATA solid state drive (SSD) is designed to provide seamless service to the utmost standards, especially in mission critical industrial and medical applications.

Enterprise vs Client SSD

840L-D is designed to meet the requirements of JESD 218/219 Enterprise workloads to a very high standard. This includes thermal management, UBER & 24/7 operation.

Guaranteed Power Loss Protection (PLP)

While PLP of most SSDs is focused on ensuring no data corruption in the event of a power failure, 840L-D goes even further to ensure that data in-the-fly is also protected.

A Lifetime of Stable Operation

840L-D provides 2-3 times more than usual overprovisioning (SSD buffer) without sacrificing user space. This is combined with its tailored firmware, which ensures stable read/write performance and high write endurance (TBW).

840L-D Series Design Features

The 840L-D series is designed for JESD enterprise workloads running 24/7 applications.

840L-D utilizes 1/8 more NAND flash to provide 20% greater write endurance. The overprovisioning default is 20% -33% (compared to the typical 8% – 15%) to provide a long lifetime of stable performance.

>99% QoS (quality of service) rating with a guaranteed max. latency (see datasheet for details).

There is enhanced power loss protection (PLP) thanks to the built-in super-cap. The super-cap works like a small UPS which sustains power to the SSD with enough extra time to save in-the-fly data into NAND. It can survive 3500 cycles of sudden AC power failure without losing any data.

The NAND is from Kioxia and offers at least 5 years of data retention.

Key Specifications:

■ Performance

3D TLC (BiCS5)	Sequential Performance (MB/sec)		Random Performance (IOPS @4K)	
	Read	Write	Read	Write
480 GB	530.0	430.0	96K	36K
960 GB	530.0	500.0	98K	42K
1920 GB	530.0	500.0	98K	50K
3840 GB	530.0	500.0	98K	37K
7680 GB	530.0	500.0	97K	42K

- The SSD is an unformatted drive. (a) FIO on Linux : 128K sequential write with QD32 and 1 worker for the full drive. (b) FIO on Linux: 4KB random read/write with QD32 and 1 worker for the full drive.
- Performance may differ according to flash configuration and platform.
- These tables are for reference only. Any criteria for accepting goods shall be further discussed based on different flash configurations.

■ Latency

3D TLC (BiCS5)	Read (4KB) (Unit: μ s)	Write (4KB) (Unit: μ s)
480 GB	115	25
960 GB	115	25
1920 GB	115	25
3840 GB	120	25
7680 GB	145	25

- The SSD is an unformatted drive. FIO on Linux with QD1 with 1 worker.
- Performance may differ according to flash configuration and platform.
- These tables are for reference only. Any criteria for accepting goods shall be further discussed based on different flash configurations.

Quality of Service (QoS 99%)

3D TLC (BiCS5)	Read 4KB, QD=1 (Unit: μ s)	Write 4KB, QD=1 (Unit: μ s)	Read 4KB, QD=32 (Unit: μ s)	Write 4KB, QD=32 (Unit: μ s)
480 GB	138	36	569	815
960 GB	136	35	436	798
1920 GB	134	30	378	708
3840 GB	177	31	428	856
7680 GB	211	36	528	897

1. FIO test: 4KB transfer size, QD=1, 32 on 4KB random read and write workload on the whole LBA range of the drive once it performs in a steady state and all background operations run normally.
2. According to random 4KB QD=1 and 32 workloads, the result of QoS is the maximum round-trip time which is taken for 99.0 % of commands to host.
3. QoS may differ according to flash configuration and platform.
4. These tables are for reference only. Any criteria for accepting goods shall be further discussed based on different flash configurations.

Endurance

3D TLC (BiCS5)	TBW	DWPD*
480 GB	1,210	1
960 GB	1,725	1
1920 GB	3,564	1
3840 GB	9,682	1
7680 GB	14,650	1

1. Endurance of 1 drive write per day (DWPD) for 5 years.
2. The endurance measurement is based on the JEDEC 219A Enterprise Workload.

UBER

3D TLC (BiCS5)	UBER
480 GB 960 GB 1920 GB 3840 GB 7680 GB	< 1 sector per 10^{17} bits read

1. UBER (Uncorrectable Bit Error Rates) means the uncorrectable errors per bits read.

Ordering information

P/N	Density	FF	I/F	NAND	Temp (°C)	AES/OPAL
SQF-S25C5-480GDSCC	480GB	2.5"	SATA	BICS5 TLC	0-70	Yes/Yes
SQF-S25C9-960GDSCC	960GB	2.5"	SATA	BICS5 TLC	0-70	Yes/Yes
SQF-S25C9-1K9GDSCC	1.9TB	2.5"	SATA	BICS5 TLC	0-70	Yes/Yes
SQF-S25CA-3K8GDSCC	3.8TB	2.5"	SATA	BICS5 TLC	0-70	Yes/Yes
SQF-S25CA-7K6GDSCC	7.6TB	2.5"	SATA	BICS5 TLC	0-70	Yes/Yes