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Product Catalog

RUGGEDIZED SOLID-STATE STORAGE SOLUTIONS

Defense · Aerospace · Industrial

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About This Catalog

This Catalog provides a comprehensive overview of Asine's ruggedized solid-state storage product line, including key specifications, applications, and real-world use cases for each product family. Space has been reserved on each product page for official product photography.

Key Differentiators

- MIL-STD and industrial certified
- MTBF up to 2,000,000 hours
- AES-256 hardware encryption
- TCG OPAL
- H/W and S/W trigger internal Secure Erase
- Operating altitudes up to 100,000 ft.
- Shock rated to 1,500G / 0.5ms
- -50°C to +105°C operating temperature range
- Conformal coating
- Conduction cooling

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01 M.2 MLC or 3D eNAND NVMe up to 8TB

Photon Series | AS-M.2-2242 / AS-M.2-2280

Product Overview

The Photon Series M.2 SSD delivers NVMe interface storage in a compact 2242 or 2280 package using MLC or 3D eNAND TLC Flash technology. Built for mission-critical applications requiring high reliability, Conduction Cool, H/W trigger Secure Erase for 2242 model, AES-256 encryption, TCG OPAL industrial temperature tolerance, and resistance to shock and vibration, this drive is the workhorse of Asine's embedded storage line.

Key Specifications

Form Factor	M.2 2242 / M.2 2280
Flash Technology	3D TLC / MLC eNAND Flash
Capacity	eNAND: (2280) 240GB ~ 7680GB |(2242) 160GB~2TB | MLC/pSLC (2242): 120GB ~ 500GB
Interface	PCIe (2242) Gen3 (2280) Gen4 x4 lanes, NVMe 1.3/1.4 compliant
Sequential Read	eNAND: up to 3480 MB/s | MLC/pSLC: up to 500 MB/s
Sequential Write	eNAND: up to 3000 MB/s | MLC/pSLC: up to 500 MB/s
Random IOPS	(4KB) eNAND Read: 335K | Write: 280K | MLC: up to 25K R/W
Endurance (TBW)	eNAND: up to 900 TBW @ 2TB | Enterprise: 6000 TBW @ 1TB
MTBF	2,000,000 hours
Operating Temp	Commercial: 0°C to +70°C | Industrial: -40°C to +85°C
Storage Temp	-40°C to +85°C
Shock Resistance	eNAND: 1,500 G/0.5ms | MLC: 1,000 G/0.5ms
Vibration	eNAND: 2-500Hz, 3.1G | MLC: 2.17 Grms (5-700Hz)
Security	AES-256 hardware encryption; NVMe Fast Erase; Optional OPAL; H/W trigger Secure Erase for up to 2TB 2242 models
Error Correction	EDC/ECC up to 64-bit BCH; Dynamic & Static wear leveling
Power (Active)	eNAND: up to 5.7W | MLC: max 3.7W @ 500GB
OS Support	Windows, Linux (no special drivers required)
Humidity	5% to 95% relative, non-condensing
Compliance	RoHS, JGPSSI-JIG, REACH

For the latest datasheets, visit asine-global.com/products

Applications

- Industrial & Commercial PC/Tablet systems
- Factory Automation & Smart Terminals
- Navigation, Infotainment & Avionics
- Airborne & Rugged Computer systems
- Security & Homeland Security platforms
- High-Speed Data Recording
- Video Surveillance (JPEG2000 Capture)
- JBOD, NAS, SAN, RAID arrays
- Defense systems & embedded computing
- Broadcasting, Video & Audio servers

Best Used For

IDEAL FIT	Applications demanding high throughput NVMe performance in a compact M.2 footprint — particularly where industrial temperature tolerance, rugged shock/vibration resistance, and hardware security encryption are non-negotiable. Ideal for embedded systems requiring long-life reliability.

Real-World Use Case

Scenario
An airborne ISR (Intelligence, Surveillance, Reconnaissance) platform requires high-speed data capture of sensor feeds at 3+ GB/s while exposed to extreme vibration profiles and temperature swings. The Asine M.2 NVMe 2280 TLC model is installed in the mission computer, providing 3480 MB/s read throughput for real-time processing, 1500G shock tolerance, and AES-256 encryption to protect classified data — all within the strict weight and size constraints of an airborne chassis.

02 M.2 2230 NVMe 3D eNAND Gen 4 upto2TB

Photon Series | AS-M.2-2230

Product Overview

The Photon Series M.2-2230 is Asine's smallest-footprint NVMe SSD, offering Gen4 PCIe 4X lane

performance in a 22x30mm package. Designed for embedded systems, rugged tablets, and space-constrained platforms where board real estate is at a premium, this drive delivers next-generation bandwidth with high longevity eNAND flash and industrial certifications.

Key Specifications

Form Factor	M.2 2230 (22mm x 30mm)
Flash Technology	3D TLC eNAND / pTLC
Capacity	240GB to 2TB
Interface	PCIe Gen4 x4 lanes, NVMe 1.4 compliant
Sequential Read	Up to 5200 MB/s @ 1TB
Sequential Write	Up to 4370 MB/s @ 1TB; 2550 MB/s @ 480GB
Random IOPS (4KB)	Read: up to 330K | Write: up to 280K
Endurance (TBW)	eNAND: up to 2360 TBW @ 1960GB | pTLC: up to 5400 TBW @ 1700GB
DWPD	TLC: 1.1 DWPD @ 3yr | pTLC: 2.9 DWPD @ 3yr
MTBF	2,000,000 hours
Operating Temp	Commercial: 0°C to +70°C | Industrial: -40°C to +85°C | Extreme: -40°C to +95°C
Storage Temp	-50°C to +95°C
Altitude	Up to 80,000 ft. (operating & non-operating)
Shock Resistance	1,500 G/0.5ms
Vibration	2-500Hz, 3.1G
Security	AES-256 hardware encryption; Fast Sanitize Erase; Optional OPAL
Error Correction	LDPC EDC/ECC; 64-bit BCH; Dynamic & Static wear leveling; SMART
Power (Active)	Read+Write: 2.5W; 80% Sustain Write: 3.6W; Idle: 0.1W
OS Support	Windows, Linux (no special drivers required)
Compliance	REACH, RoHS; High-longevity design

Applications

- Industrial & Commercial PC/Tablet systems
- ATM, Gaming & Lottery terminals
- Automotive, Navigation, Infotainment & ECU
- Point-of-Sale (POS), Kiosk & Smart Terminals
- Medical devices & imaging systems
- Industrial Avionics & Airborne systems
- Rugged Computers
- High-Speed Data Recording
- Security & Homeland Security platforms
- Video Surveillance (JPEG2000 Capture)

Best Used For

IDEAL FIT	Space-constrained systems that cannot accommodate a full-length M.2 2280 but still require Gen4 NVMe performance. The 2230 form factor is particularly well-suited for ultra-compact rugged tablets, next-generation avionics computers, and automotive ECU platforms where card length is restricted but bandwidth is critical.

Real-World Use Case

Scenario
A ruggedized military tablet used for battlefield situational awareness requires a storage solution that fits within a 22x30mm envelope, survives 1500G shock events, and operates across extreme temperatures. The Asine M.2-2230 Gen4 delivers 5200 MB/s read speed for rapid map and imagery loading, with pTLC endurance sufficient for continuous write-intensive logging — all in a package smaller than a postage stamp.

03 U.2 NVMe 3D eNAND

Photon Series | AS-U.2-HCF-NVMe

up to 8TB

Product Overview

The Photon Series U.2 SSD presents NVMe in the industry-standard SFF-8639 2.5-inch form factor, delivering enterprise-class capacity up to 7.68TB. Designed for server, storage infrastructure, and industrial applications requiring massive data throughput, this drive combines high IOPS with proven ruggedized reliability and AES-256 hardware encryption.

Key Specifications

Form Factor	U.2 / SFF-8639 (2.5")
Flash Technology	3D eNAND Flash
Capacity	160GB to 7.68TB
Interface	PCIe Gen3 x4 lanes, NVMe 1.3 compliant
Sequential Read	Up to 3300 MB/s
Sequential Write	Up to 3000 MB/s
Random IOPS (4KB)	Read: up to 600K | Write: up to 500K
Endurance (TBW)	Up to 840 TBW @ 8TB
DWPD	0.7 to 1.1 (usage profile dependent)
MTBF	1,500,000 hours
Operating Temp	Commercial: 0°C to +60°C; Industrial: -40°C to +85°C
Storage Temp	-40°C to +85°C
Shock Resistance	1,000 G/0.5ms (non-operating)
Vibration	10-2000Hz, 16.3G GRMS
Fall Resistance	70 cm free fall on each axis
Security	AES-256 hardware encryption; NVMe Secure Erase; Optional OPAL; H/W trigger Secure Erase for up to 2TB models
Error Correction	EDC/ECC; Bad Block Mapping; Wear Leveling; Moderate SPOR/PLP
Power (Active)	Up to 6.5W active; 0.1W idle
Physical Size	100.35 x 70.1 x 9.5 mm | Weight: max 180g
OS Support	Windows, Linux, VxWorks (no special drivers required)
Compliance	RoHS

Applications

- Industrial & Commercial server storage
- Enterprise storage arrays
- Medical imaging (MRI, CT data management)
- Security & Homeland Security infrastructure
- Storage over fiber-optic infrastructure fabric
- JBOD, NAS, SAN, RAID platforms
- Navigation & Infotainment systems
- Autonomous vehicle platforms
- defense edge computing with large data sets

Best Used For

IDEAL FIT	Server and enterprise storage environments requiring massive capacity (up to 8TB) in the hot-swappable U.2 form factor with NVMe performance. Particularly well-suited for data-intensive workloads such as medical imaging archives, edge AI inference storage, and large-scale surveillance data retention.

Real-World Use Case

Scenario
A defense contractor building a ground-based intelligence fusion center needs high-density, high-throughput local storage that can survive field transport and operate without active cooling. Deployed in a ruggedized server chassis, the Asine U.2 7.68TB NVMe provides 600K read IOPS for simultaneous multi-sensor data fusion, secure erase capability for classified data handling, and 1000G shock tolerance for transit deployments — with VxWorks RTOS driver compatibility for mission-critical software stacks.

04 M.2 & 2.5" SSD SATA 3D eNAND

Photon Series | AS-2.5-SATA3 / AS-M.2-SATA

Product Overview

The Photon Series M.2 and 2.5-inch SATA SSD family provide 3D eNAND TLC Flash storage across two form factors with the universal SATA3 interface. This dual-format product line is the go-to choice for system designers who need a proven SATA solution compatible with a broad range of existing platforms — from defense computers to industrial automation — without sacrificing environmental ruggedization.

Key Specifications

Form Factors	2.5" (SFF) and M.2 2242 / 2280 / D5-BM
Flash Technology	3D eNAND TLC Flash
Capacity	2.5": 240GB to 1920GB | M.2-2242: 120GB-500GB | M.2-2280: 240GB-2000GB
Interface	SATA 1/2/3, Protocol SATA 3.2
Sequential Read	Up to 560 MB/s
Sequential Write	Up to 520 MB/s
Random IOPS (4KB)	2.5" Read: 100K / Write: 91K | M.2 Read: 80K / Write: 81K
Endurance (TBW)	2.5"/M.2-2280 2TB: up to 1360 TBW | M.2-2242 500GB: up to 500 TBW | Enterprise: up to 12,000 TBW
MTBF	1,500,000 hours
Operating Temp	Commercial: 0°C to +70°C | Industrial: -40°C to +85°C
Storage Temp	-40°C to +85°C
Shock Resistance	1,500 G/0.5ms
Vibration	2-500Hz, 3.1G
Security	AES-256; Secure Erase (ATA8); User ATA password (M.2); Optional OPAL
Error Correction	EDC/ECC 64-bit BCH; Dynamic & Static wear leveling; PLP-SPOR
Power	Idle: 0.1W | Active: max 2.1W
OS Support	Windows, Linux, VxWorks (no special drivers required)
Physical Size (2.5")	100.2 x 70 x 7 mm | Weight: 78g
Physical Size (M.2)	2280: 80x22x3.6mm | 2242: 42x22x3.6mm |4 gr.
Compliance	RoHS, JGPSSI-JIG, REACH

Applications

- Industrial & Commercial PC/Tablet systems
- Gaming platforms
- Navigation & Infotainment
- Smart Terminals
- Airborne & Rugged Computer systems
- Security & Homeland Security
- High-Speed Data Recording
- Video Surveillance (JPEG2000 Capture)
- defense, bootloader & embedded firmware
- JBOD, NAS, SAN, RAID deployments

Best Used For

IDEAL FIT	Systems and platforms already designed around SATA infrastructure that need a dual-sourced, ruggedized industrial SSD with broad form factor coverage. Especially valuable in legacy-compatible defense systems, airborne avionics refreshes, and industrial automation controllers where NVMe is not yet supported.

Scenario

A shipboard combat management system undergoing a technology refresh requires SATA-compatible storage that can withstand high naval vibration profiles and saltwater humidity exposure. The Asine 2.5-inch SATA SSD is deployed as the primary OS drive, providing 560 MB/s read throughput for fast system boot, 1500G shock tolerance for explosive blast events, AES-256 encryption for at-rest data protection, and conformal coating availability for the salt-spray marine environment.

Real-World Use Case

conduction cooling (no airflow needed in a sealed chassis), conformal coating for dust and moisture protection, and fast sanitize erase capability for rapid data destruction if the vehicle is compromised. MTBF of 1.5 million hours ensures the system exceeds the vehicle's expected service life.