

# Industrial SSD & DRAM Solutions for Transportation Applications



As autonomous driving, smart cars and the Internet of Vehicles (IoV) are expected to become early adopters of 5G technology, the application requirements for in-vehicle and transportation data storage will naturally change as a result. From navigation systems, In-Vehicle Infotainment (IVI) and Advanced Driver Assistance Systems (ADAS) to surveillance and intelligent transportation systems outdoors, industrial SSDs and memory modules are increasingly tasked with reliably reading and writing data.

## Featured Technologies for Transportation Devices



### Anti-Sulfuration

Apacer's world's first patented anti-sulfuration DRAM modules and anti-sulfuration SSDs with the industry's highest level of anti-corrosion ANSI/ISA 71.04 G3 Certification can meet the needs of industrial products facing harsh environments.



### SLC-liteX

Apacer's 3D NAND SLC-liteX technology breaks through the limitations of existing technology and provides up to 100,000 P/E cycles, which is 33 times more than MLC or industrial 3D TLC.



### Power Stability

- CorePower
- DataDefender™



### Longevity

- Over-provisioning
- SLC-liteX
- Fixed BOM
- 6+6 PCN/EOL Policy



### Survivability

- Anti-Sulfuration
- Conformal Coating
- Nano Coating (IP57)
- Sidefill
- Wide Temperature
- 30μ Gold Finger



### Value-added Applications

- Double-barreled Solution
  - CoreAnalyzer2
  - SSDWidget 2.0

## Recommended Industrial SSD Solutions

| Model                         | PV220-M280                                             | SV250-M280       | SV24P-M280       | SV24P-25         | PH920-M280                                 | SH250-25         | CH120-MSD   |
|-------------------------------|--------------------------------------------------------|------------------|------------------|------------------|--------------------------------------------|------------------|-------------|
| Features                      | Anti-Sulfuration                                       |                  | CorePower        |                  | SLC-liteX                                  |                  |             |
| Form Factor                   | M.2 2280                                               | M.2 2280         | M.2 2280         | 2.5"             | M.2 2280                                   | 2.5"             | microSD     |
| Interface                     | PCIe Gen3 x4                                           | SATA 3.2 (6Gb/s) | SATA 3.2 (6Gb/s) | SATA 3.2 (6Gb/s) | PCIe Gen3 x4                               | SATA 3.2 (6Gb/s) | SD 6.1      |
| Connector                     | M.2 M Key                                              | M.2 B & M key    | M.2 B & M key    | (7+15) pin       | M.2 M Key                                  | (7+15) pin       | -           |
| NAND Flash Type               | 3D TLC                                                 |                  |                  |                  |                                            |                  |             |
| Capacity                      | 120~1920 GB                                            | 120~1920 GB      | 240~1920 GB      | 240~1920 GB      | 160~640 GB                                 | 40~640 GB        | 16~128 GB   |
| External DRAM                 | No                                                     | No               | Yes              | Yes              | No                                         | No               | -           |
| Max. R/W Performance (MB/sec) | 2390/2205                                              | 560/470          | 560/510          | 560/510          | 3530/2735                                  | 550/495          | 90/80       |
| Standard Operating Temp. (°C) | 0 ~ + 70                                               | 0 ~ + 70         | 0 ~ + 70         | 0 ~ + 70         | 0 ~ + 70                                   | 0 ~ + 70         | - 25 ~ + 85 |
| Wide Temp. (°C)               | - 40 ~ + 85                                            | - 40 ~ + 85      | - 40 ~ + 85      | - 40 ~ + 85      | - 40 ~ + 85                                | - 40 ~ + 85      | - 40 ~ + 85 |
| MTBF (Hours)                  | >3,000,000                                             | >3,000,000       | >3,000,000       | >3,000,000       | >3,000,000                                 | >3,000,000       | >3,000,000  |
| Recommended Applications      | Crane Truck, Excavator, Vehicles in Harsh Environments |                  |                  | Server           | Passenger Information System, Surveillance |                  | Navigation  |

## Recommended Industrial DRAM Solutions

### Anti-Sulfuration Memory Modules

| Module Type                | Anti-Sulfuration UDIMM | Anti-Sulfuration SODIMM | Anti-Sulfuration RDIMM | Anti-Sulfuration ECC UDIMM | Anti-Sulfuration ECC SODIMM |
|----------------------------|------------------------|-------------------------|------------------------|----------------------------|-----------------------------|
| Memory Technology          | DDR5                   |                         |                        |                            |                             |
| Frequency                  | 4800/5600              | 4800/5600               | 4800                   | 4800/5600                  | 4800/5600                   |
| Density                    | 8GB/16GB/32GB          | 8GB/16GB/32GB           | 16GB/32GB              | 16GB/32GB                  | 16GB/32GB                   |
| Voltage                    | 1.1v                   | 1.1v                    | 1.1v                   | 1.1v                       | 1.1v                        |
| Pin Count                  | 288-Pin                | 262-Pin                 | 288-Pin                | 288-Pin                    | 262-Pin                     |
| Width                      | 64-Bit                 | 64-Bit                  | 80-Bit                 | 72-Bit                     | 72-Bit                      |
| PCB Height                 | 1.23"                  | 1.18"                   | 1.23"                  | 1.23"                      | 1.18"                       |
| Operation Temperature (°C) | TC = 0 ~ + 85          | TC = 0 ~ + 85           | TC = 0 ~ + 85          | TC = 0 ~ + 85              | TC = 0 ~ + 85               |
| Value-added Technology     |                        |                         |                        |                            |                             |

### Rugged Memory Modules & VLP (Very Low Profile) Memory Modules

| Module Type                | XR-DIMM          | Rugged SODIMM               | VLP UDIMM                | VLP SODIMM    | VLP RDIMM         | VLP ECC UDIMM     | VLP ECC SODIMM |
|----------------------------|------------------|-----------------------------|--------------------------|---------------|-------------------|-------------------|----------------|
| Memory Technology          | DDR4             |                             |                          |               |                   |                   |                |
| Frequency                  | 2133/2400        | 2133/2400/2666/2933/3200    | 2133/2400/2666/2933/3200 |               |                   |                   |                |
| Density                    | 8GB/16GB         | 8GB/16GB/32GB               | 4GB/8GB/16GB/32GB        | 4GB/8GB       | 4GB/8GB/16GB/32GB | 4GB/8GB/16GB/32GB | 4GB/8GB        |
| Voltage                    | 1.2v             | 1.2v                        | 1.2v                     | 1.2v          | 1.2v              | 1.2v              | 1.2v           |
| Pin Count                  | 300-Pin          | 260-Pin                     | 288-Pin                  | 260-Pin       | 288-Pin           | 288-Pin           | 260-Pin        |
| Width                      | 64-Bit / 72-Bit  | 64-Bit / 72-Bit             | 64-Bit                   | 64-Bit        | 72-Bit            | 72-Bit            | 72-Bit         |
| PCB Height                 | 1.466"           | 1.377"                      | 0.738"                   | 0.709"        | 0.738"            | 0.738"            | 0.7"           |
| Operation Temperature (°C) | TC = - 40 ~ + 85 | TC = 0 ~ + 85 / - 40 ~ + 85 | TC = 0 ~ + 85            | TC = 0 ~ + 85 | TC = 0 ~ + 85     | TC = 0 ~ + 85     | TC = 0 ~ + 85  |
| Value-added Technology     |                  |                             |                          |               |                   |                   |                |