swissbit®

Product Fact Sheet

Industrial CFast Card

F-86 Series

SATA Gen3 – 6.0 Gbit/s, 3D pSLC

Commercial and Industrial Temperature Grade

Date: February 02, 2022
Revision: 1.03



Made in Germany

Product Summary

- **Capacities:** 10 GBytes, 20 GBytes, 40 GBytes, 80 GBytes, 160 GBytes (3D pSLC)
- **Form Factor:** CFast-Sized Solid State Drive (36.4 mm x 42.8 mm x 3.6 mm)
- **Interface[1]:** SATA Gen3 – 6 Gbit/s (Gen2 – 3 Gbit/s and Gen1 – 1.5 Gbit/s backward compatible)
- **Command Sets:** Supports ATA/ATAPI-8 and ACS-4
- **CFast 2.0 compliant**
- **Performance:**
  - Burst Transfer Rate: Up to 600 MBytes/s in SATA Gen3 – 6.0 Gbit/s
  - Read Performance: Sequential Read up to 372 MBytes/s, Random Read 4K up to 13,100 IOPS
  - Write Performance: Sequential Write up to 223 MBytes/s, Random Write 4K up to 8,300 IOPS
- **Operating Temperature Range[2]:**
  - Commercial: 0 °C to 70 °C
  - Industrial: -40 °C to 85 °C
- **Storage Temperature Range:** -40 °C to 85 °C
- **Operating Voltage:** 3.3 V ± 5%
- **Power (160 GBytes) typ:**
  - Read (Active): 1,090 mW
  - Write (Active): 810 mW
  - Idle: 191 mW
  - Slumber: 50 mW
  - DEVSLP: 2.6 mW
- **Data Retention:** 10 Years @ Life Begin / 1 Year @ Life End
- **Endurance in DiskWritesPerDay (DWPD):**
  - JEDEC Enterprise Workload: up to 2.7
  - JEDEC Client Workload: up to 13
- **Shock/Vibration:** 500 *g* / 20 *g*
- **High-Performance Dual Core 32-Bit Processor with Integrated, Parallel Flash Interface Engines:**
  - Triple-Level Cell (TLC) 3D NAND Flash in pSLC mode
  - Flexible BCH and GCC ECC engines provide superior error correction performance
- **High Reliability:**
  - Mean Time Between Failure (MTBF): > 2,000,000 hours @ 25 °C
  - Data Reliability: < 1 non-recoverable error per 10^{16} bits read
  - 30 µinch Gold-Plated Connector

[1] The verification of host system and storage device compatibility is in customer's responsibility. Swissbit can provide guidance and support on request.
[2] Adequate airflow is required to ensure the temperature, as reported in the S.M.A.R.T. data, does not exceed 120 °C (industrial temperature drive) and 105 °C (commercial temperature drive) respectively.

Product Features

- Dynamic and Static Wear Leveling
- Subpage Mode Flash Translation Layer (FTL)
- Optimized FW algorithms especially for high read access and long data retention applications:
  - Proven power fail management for highest reliability
  - Near Miss ECC technology
    Minimize the risk of uncorrectable bit failure over the product life time. Each read command analyzes the ECC margin level and refreshes data if necessary.
  - Read Disturb Management
    Read commands are monitored and the data is refreshed when critical numbers are reached.
  - Wear Leveling technology
    Equal wear leveling of static and dynamic data. The wear leveling assures that dynamic data as well as static data is balanced evenly across the memory. This guarantees the maximum write endurance of the device.
  - Data Care Management
    An interruptible background process controls the user data for read disturb effects or high temperature related retention degradation and refreshes data if necessary.
- Lifetime Enhancements
  - Dynamic Bad Block Remapping
  - Write Amplification Reduction
- TRIM and NCQ Support
- ATA Security Feature Set Support
- DEVSLP Compatible
- In-Field Firmware Update[3]
- Enterprise-Grade Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.)
- End-to-End (E2E) Data Path Protection
- Advanced protection against radiation and soft-errors by SRAM ECC and low-alpha package
- AES-128/256 encryption support with CBC and XTS modes (on request)
- TCG Opal 2.0 and secure boot feature (on request)
- On-die temperature sensor
- Life Cycle Management
- Controlled "Locked" BOM
- RoHS 6 compliance
- Swissbit Life Time Monitoring (SBLTM) Tool and SDK



Why Swissbit?

Swissbit is focused on the design, development, manufacture, and support of leading edge memory and storage solutions for the worldwide OEM/ODM marketplace. As a global supplier, Swissbit recognizes and addressees the higher level of application requirements of today's industrial, Netcom, and automotive customers by providing best-in-class products and services, with uncompromised attention to driving overall value and quality.

[3] The support of In-Field FW update capabilities of host systems is recommended.