



Industrial CFast Specification

(ACHIEVER SERIES, MLC)

Version 1.4

Address: 28 Genting Lane, #09-03/4/5 Platinum 28, Singapore 349585

Tel : +65-6493 5035

Fax : +65-6493 5037

Website: <http://www.flexxon.com>

Email: flexxon@flexxon.com

TABLE OF CONTENTS

1.	GENERAL DESCRIPTION	1
1.1.	Introduction.....	1
1.2.	Product Overview	2
2.	PRODUCT SPECIFICATIONS.....	3
2.1.	Performance.....	3
2.2.	Power.....	3
2.3.	TBW (Terabytes Written)	4
2.4.	MTBF	4
2.5.	Data Retention	4
3.	ENVIRONMENTAL SPECIFICATIONS.....	5
4.	ATA COMMANDS.....	6
5.	PIN ASSIGNMENT	8
6.	PHYSICAL DIMENSION	9
7.	ORDERING INFORMATION.....	10

1. GENERAL DESCRIPTION



1.1. Introduction

FLEXXON’s ACHIEVER CFast has SATA III interface, and is fully compliant with standard CFast Form Factor. It supports good performance, high reliability and low power management. It is suitable for heavy-loading or multi-tasking applications.

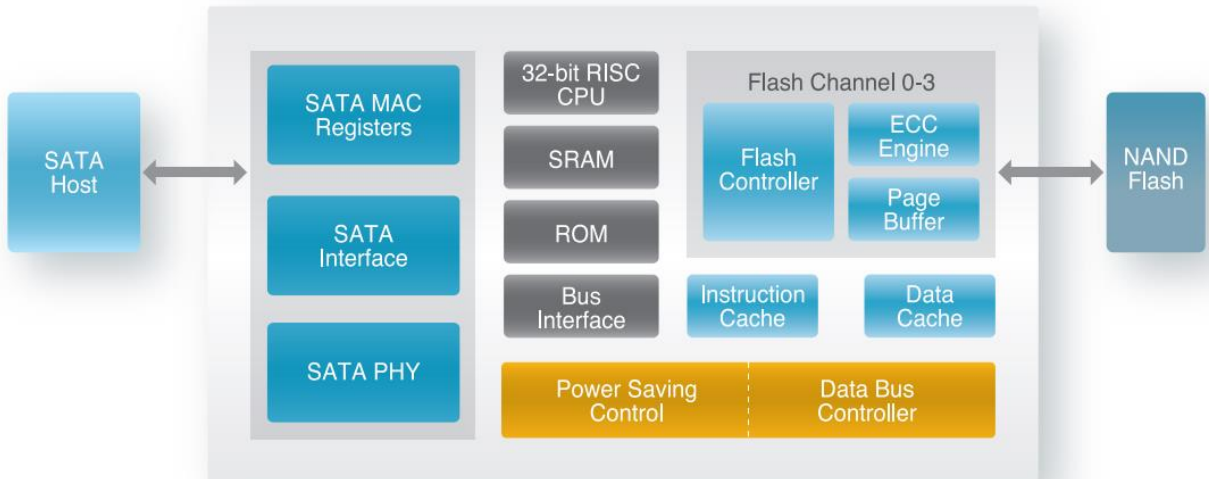


Figure 1-1 ACHIEVER CFast Controller Block Diagram

FLEXXON

1.2. Product Overview

- ❖ **Flash**
 - MLC
- ❖ **Capacity**
 - 8GB up to 256GB
- ❖ **SATA Interface**
 - Compliant with SATA Revision 3.1
 - Compatible with SATA 1.5Gbps, 3Gbps and 6Gbps interface
- ❖ **ECC Scheme**
 - Up to 66 bits error in 1K Byte data
- ❖ **UART Function**
- ❖ **GPIO**
- ❖ **Support SMART and TRIM commands**
- ❖ **Low Power Management**
- ❖ **Internal data shaping technique increase data endurance**
- ❖ **Global Wear Leveling Algorithm**
- ❖ **Hardware Write Protect (Optional)**
- ❖ **Temperature Range**
 - Operation (Silver) : 0°C ~ 70°C
 - Operation (Diamond) : -40°C ~ 85°C
 - Storage: -55°C ~ 95°C
- ❖ **RoHS Compliant**

2.1. Performance

Table 2-1 Performance of ACHIEVER CFast

Capacity	Sequential	
	Read (MB/s)	Write (MB/s)
8GB	90	25
16GB	140	25
32GB	280	50
64GB	530	100
128GB	530	100
256GB	530	100

NOTES:

1. The performance was measured using CrystalDiskMark with SATA 6Gbps host.
2. Performance may differ according to flash configuration and platform.

2.2. Power

Table 2-2 Supply Voltage of ACHIEVER CFast

Parameter	Rating
Operating Voltage	3.3V +/- 5%

Table 2-3 Power Consumption of ACHIEVER CFast

Parameter	Power Consumption
Idle (max.)	0.264 W
Active (max.)	3.6 W

NOTE:

Power Consumption may differ according to flash configuration and platform.



2.3. TBW (Terabytes Written)

Capacity	TBW
16GB	29
32GB	58
64GB	117
128GB	235
256GB	464

NOTES:

1. TBW may differ according to flash configuration and platform.
2. Samples were tested under JESD218A endurance test method and JESD219A endurance workloads specification.

2.4. MTBF

MTBF, an acronym for Mean Time Between Failures, is a measure of a device's reliability. Its value represents the average time between a repair and the next failure. The predicted result of FLEXON's ACHIEVER CFast is more than 3 million hours.

2.5. Data Retention

- 10 years if > 90% life remaining (@25C)
- 1 year if < 10% life remaining (@25C)

3. ENVIRONMENTAL SPECIFICATIONS



Test Items	Test Conditions
Storage Temperature	-55°C ~ 95°C
Operating Temperature	Silver Grade: 0°C ~ 70°C Diamond Grade: -40°C ~ 85°C
Storage Humidity	Silver Grade: 40°C, 95% RH Diamond Grade: 55°C, 95% RH
Operating Humidity	Silver Grade: 40°C, 93% RH Diamond Grade: 55°C, 95% RH
Shock	1500G, Half Sin Pulse Duration 0.5ms
Vibration	80Hz ~ 2000Hz/20G, 20Hz ~ 80Hz/1.52mm, 3 axis/60min
Drop	80cm free fall, 6 face of each unit, 2 times each
Bending	≥ 20N, Hold 1 min/5 times
ESD	24°C, 49% RH, +/-4KV 25 times, Air +/-8KV 10 times

FLEXXON CONFIDENTIAL

Table 4-1 Supported ATA Command Set

#	Command	Code	Protocol
General Feature Set			
	Execute Drive Diagnostic	90h	Device diagnostic
	Flush Cache	E7h	Non-data
	Identify Device	ECh	PIO data-in
	Initialize Drive Parameters	91h	Non-data
	Read DMA	C8h	DMA
	Read Log Ext	2Fh	PIO data-in
	Read Multiple	C4h	PIO data-in
	Read Sector(s)	20h	PIO data-in
	Read Verify Sector(s)	40h or 41h	Non-data
	Set Feature	EFh	Non-data
	Set Multiple Mode	C6h	Non-data
	Write DMA	CAh	DMA
	Write Multiple	C5h	PIO data-out
	Write Sector(s)	30h	PIO data-out
	NOP	00h	Non-data
	Read Buffer	E4h	PIO data-in
	Write Buffer	E8h	PIO data-out
Power Management Feature Set			
	Check Power Mode	E5h or 98h	Non-data
	Idle	E3h or 97h	Non-data
	Idle Immediate	E1h or 95h	Non-data
	Sleep	E6h or 99h	Non-data
	Standby	E2h or 96h	Non-data
	Standby Immediate	E0h or 94h	Non-data

Security Mode Feature Set		
Security Set Password	F1h	PIO data-out
Security Unlock	F2h	PIO data-out
Security Erase Prepare	F3h	Non-data
Security Erase Unit	F4h	PIO data-out
Security Freeze Lock	F5h	Non-data
Security Disable Password	F6h	PIO data-out
SMART Feature Set		
SMART Disable Operations	B0h	Non-data
SMART Enable/Disable Autosave	B0h	Non-data
SMART Enable Operations	B0h	Non-data
SMART Execute Off-Line Immediate	B0h	Non-data
SMART Read Log	B0h	PIO data-in
SMART Read Data	B0h	PIO data-in
SMART Read Threshold	B0h	PIO data-in
SMART Return Status	B0h	Non-data
SMART Save Attribute Values	B0h	Non-data
SMART Write Log	B0h	PIO data-in
Host Protected Area Feature Set		
Read Native Max Address	F8h	Non-data
Set Max Address	F9h	Non-data
Set Max Set Password	F9h	PIO data-out
Set Max Lock	F9h	Non-data
Set Max Freeze Lock	F9h	Non-data
Set Max Unlock	F9h	PIO data-out
NCQ Feature Set		
Read FPDMA Queued	60h	DMA Queued
Write FPDMA Queued	61h	DMA Queued

5. PIN ASSIGNMENT

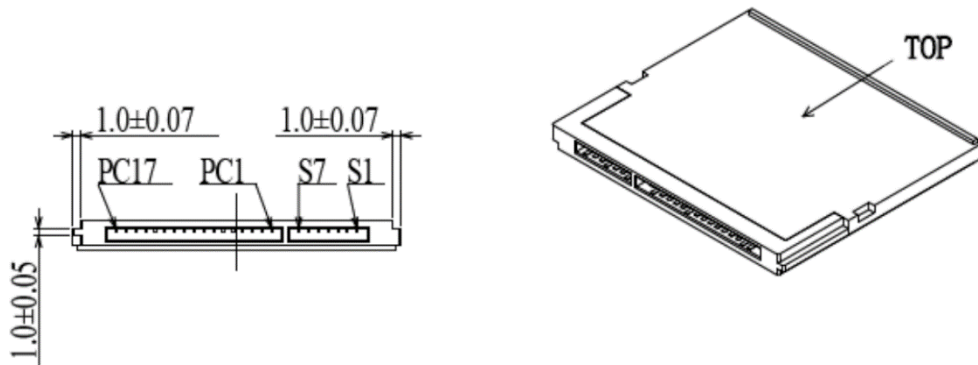


Figure 5-1 Pin Assignment of ACHIEVER CFast

Table 5-1 Pin Assignment and Function

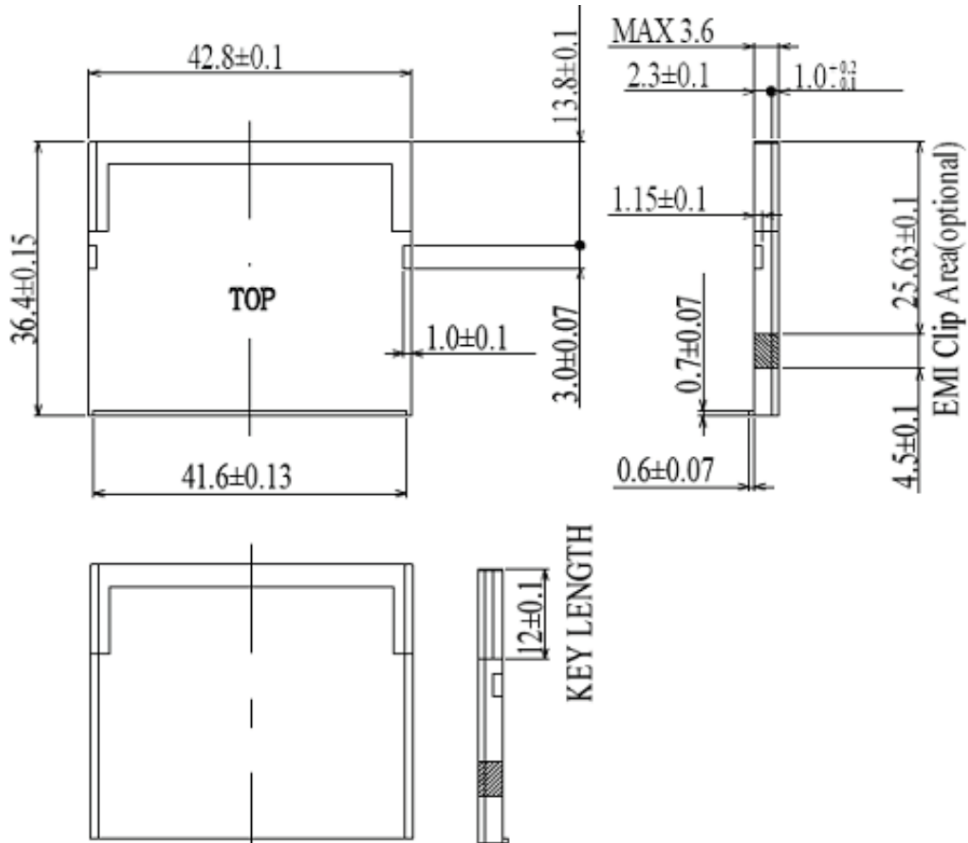
PIN #	Function
PC1	Card Detect Input
PC2	Device GND
PC3	DEVSLP (I) (O/3.3V)
PC4	N/C
PC5	N/C
PC6	N/C
PC7	Device GND
PC8	DASP (Default)
PC9	DASP (Optional)
PC10	W/P and Q/E Function (Optional)
PC11	N/C
PC12	GND
PC13	3.3V
PC14	3.3V
PC15	Device GND
PC16	Device GND
PC17	Card Detect Input

PIN #	Function
S1	Signal GND
S2	SATA A+
S3	SATA A-
S4	Signal GND
S5	SATA B+
S6	SATA B-
S7	Signal GND

6. PHYSICAL DIMENSION



CFast Type I: 36.4mm (L) x 42.8mm (W) x 3.6mm (H)



FLEXION

7. ORDERING INFORMATION



Capacity	MPN (Diamond Grade)	MPN (Silver Grade)
8GB	FSSF008GME-M100	FSSF008GMS-M100
16GB	FSSF016GME-M100	FSSF016GMS-M100
32GB	FSSF032GME-M100	FSSF032GMS-M100
30GB	FSSF030GME-M100	FSSF030GMS-M100
64GB	FSSF064GME-M100	FSSF064GMS-M100
60GB	FSSF060GME-M100	FSSF060GMS-M100
128GB	FSSF128GME-M100	FSSF128GMS-M100
120GB	FSSF120GME-M100	FSSF120GMS-M100
256GB	FSSF256GME-M100	FSSF256GMS-M100
240GB	FSSF240GME-M100	FSSF240GMS-M100

Hardware Write Protect

Capacity	MPN (Diamond Grade)	MPN (Silver Grade)
8GB	FSSF008GME-M10K	FSSF008GMS-M10K
16GB	FSSF016GME-M10K	FSSF016GMS-M10K
32GB	FSSF032GME-M10K	FSSF032GMS-M10K
30GB	FSSF030GME-M10K	FSSF030GMS-M10K
64GB	FSSF064GME-M10K	FSSF064GMS-M10K
60GB	FSSF060GME-M10K	FSSF060GMS-M10K
128GB	FSSF128GME-M10K	FSSF128GMS-M10K
120GB	FSSF120GME-M10K	FSSF120GMS-M10K

Hardware Power Lost Protection

Capacity	MPN (Diamond Grade)	MPN (Silver Grade)
8GB	FSSF008GME-M10P	FSSF008GMS-M10P
16GB	FSSF016GME-M10P	FSSF016GMS-M10P
32GB	FSSF032GME-M10P	FSSF032GMS-M10P
30GB	FSSF030GME-M10P	FSSF030GMS-M10P
64GB	FSSF064GME-M10P	FSSF064GMS-M10P
60GB	FSSF060GME-M10P	FSSF060GMS-M10P
128GB	FSSF128GME-M10P	FSSF128GMS-M10P
120GB	FSSF120GME-M10P	FSSF120GMS-M10P

Revision History

Revision	Date	Description
1.0	2016/01	First release
1.1	2016/11	Update TBW
1.2	2016/12	Add Hardware Write Protect & Update Ordering Information
1.3	2019/04	Update capacity
1.4	2019/11	Update Ordering Information

FLEXION CONFIDENTIAL