



Industrial Half Slim Specification

(ACHIEVER SERIES, MLC)

Version 1.2

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1. GENERAL DESCRIPTION

1.1. Introduction

FLEXXON's ACHIEVER Half Slim has SATA III interface, and is fully compliant with the standard Half Slim form factor, known as JEDEC MO-297 standard. It supports high performance, high reliability and low power management. It is suitable for heavy-loading or multi-tasking applications.

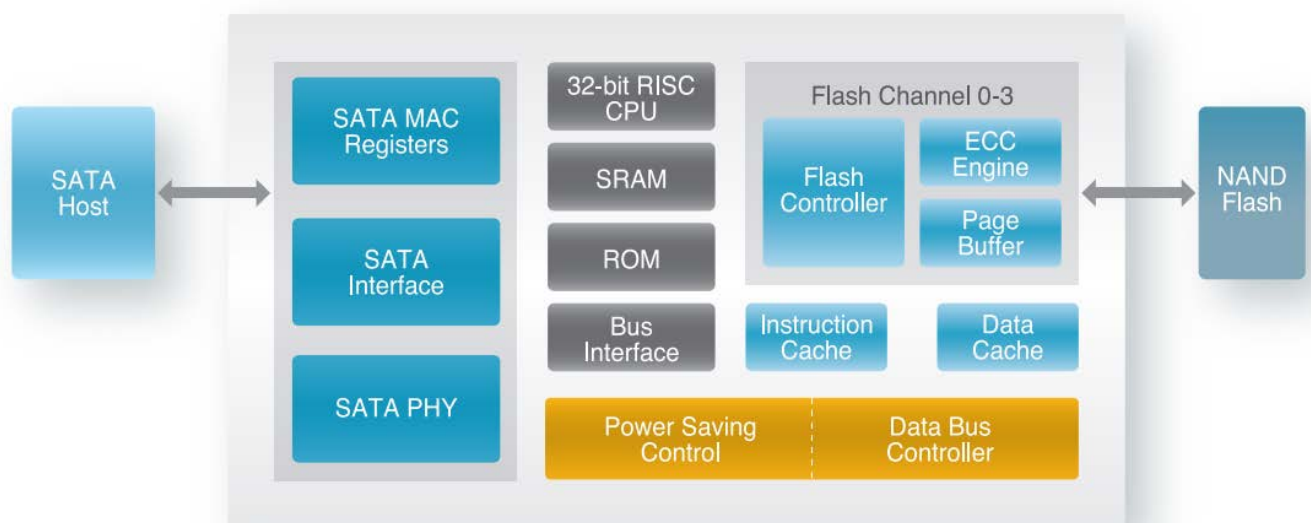


Figure 1-1 ACHIEVER Half Slim Controller Block Diagram

1.2. Product Overview

- ❖ **Flash**
 - MLC
- ❖ **Capacity**
 - 8GB up to 128GB
- ❖ **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**
- ❖ **Temperature Range**
 - Operation (Silver): 0°C ~ 70°C
 - Operation (Diamond): -40°C ~ 85°C
 - Storage: -55°C ~ 95°C
- ❖ **RoHS Compliant**

2. PRODUCT SPECIFICATIONS



2.1. Performance

Table 2-1 Performance of ACHIEVER Half Slim

Capacity	Sequential	
	Read (MB/s)	Write (MB/s)
8GB	90	15
16GB	120	20
32GB	250	40
64GB	350	100
128GB	540	200

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 Half Slim

Parameter	Parameter Specifications
Input Voltage	5V +/-10%

Table 2-3 Power Consumption of ACHIEVER Half Slim

Parameter	Specifications(W)
Idle (max.)	0.4W
Active (max.)	2.75W

NOTE:

1. Power Consumption may differ from flash configuration and platform.

2.3. TBW (Terabytes Written)

Capacity	TBW
8GB	15
16GB	29
32GB	58
64GB	117
128GB	235

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 FLEXXON's ACHIEVER Half Slim is more than 2 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	≥ 50N, Hold 1 min/5 times
ESD	24°C, 49% RH, +/-4KV

4. ATA COMMANDS



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

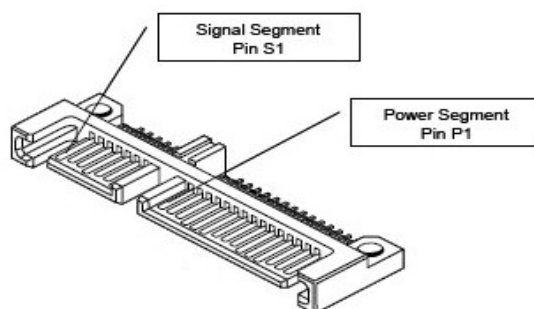


Figure 5-1 Pin Assignment and Description of ACHIEVER Half Slim

Table 5-1 Signal Segment Pin Assignment and Descriptions

Pin Number	Function
S1	GND
S2	A+ (Differential Signal Pair A)
S3	A – (Differential Signal Pair A)
S4	GND
S5	B – (Differential Signal Pair B)
S6	B+ (Differential Signal Pair B)
S7	GND

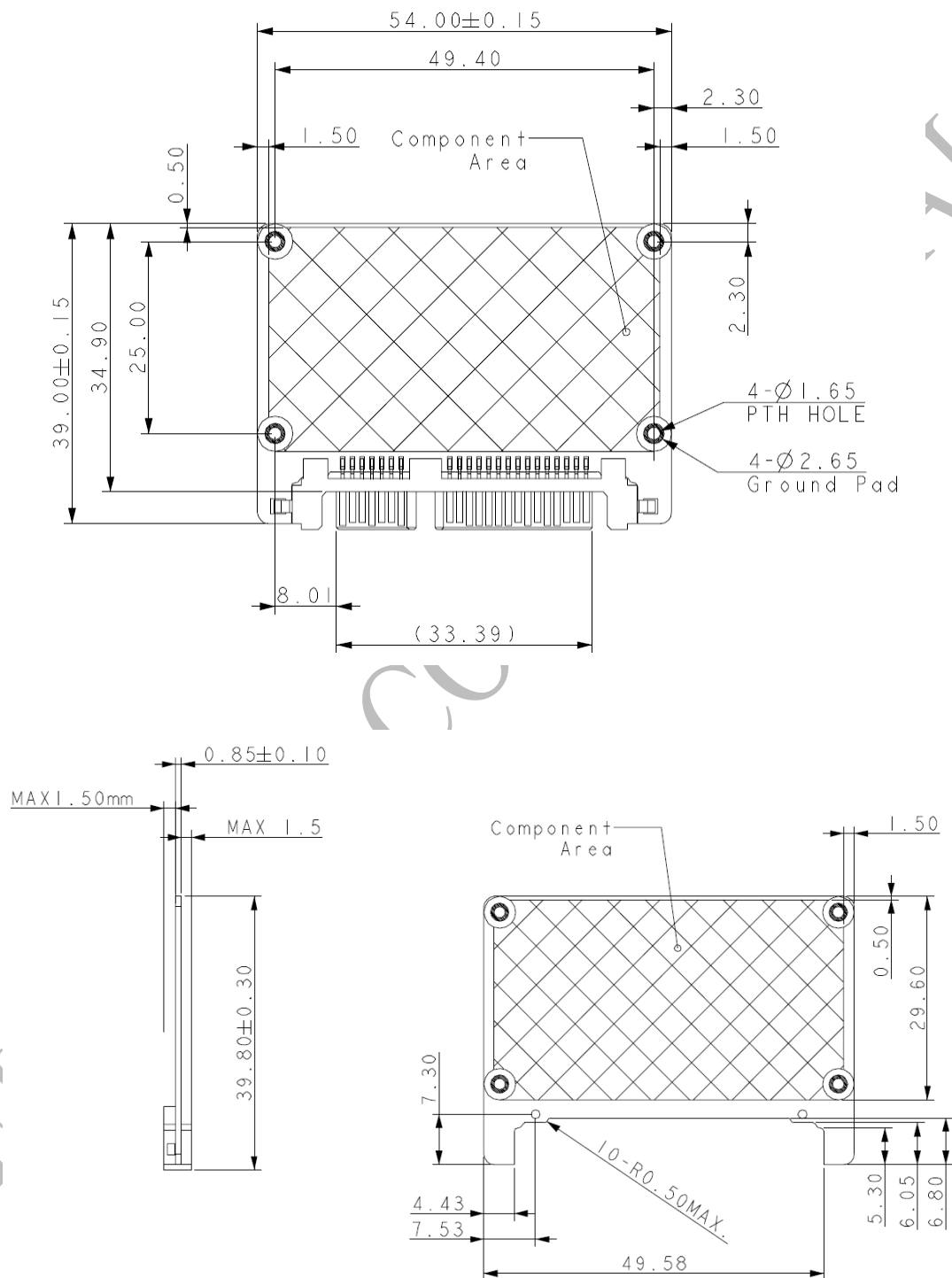
Table 5-2 Power Segment Pin Assignment and Descriptions

Pin Number	Function
P1	NC
P2	NC
P3	DEVSLP
P4	GND
P5	GND
P6	GND
P7	5V
P8	5V
P9	5V
P10	GND
P11	DAS/DSS
P12	GND
P13	NC
P14	NC
P15	NC

6. PHYSICAL DIMENSION



Dimension : 54mm (L) x 39mm (W) x 4.00mm (H)



7. ORDERING INFORMATION



Capacity	MPN (Diamond Grade)	MPN (Silver Grade)
8GB	FSSD008GME-M100	FSSD008GMS-M100
16GB	FSSD016GME-M100	FSSD016GMS-M100
32GB	FSSD032GME-M100	FSSD032GMS-M100
30GB	FSSD030GME-M100	FSSD030GMS-M100
64GB	FSSD064GME-M100	FSSD064GMS-M100
60GB	FSSD060GME-M100	FSSD060GMS-M100
128GB	FSSD128GME-M100	FSSD128GMS-M100
120GB	FSSD120GME-M100	FSSD120GMS-M100

Revision History

Revision	Draft Date	History
1.0	2016/11	First release
1.1	2016/12	Update TBW
1.2	2019/11	Update capacity