Zbit 4Gb SD NAND Datasheet

ZBSD04GBYIGY

Rev 1.0

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Contents

Revision History

Version	Date	Description
V1.0	2024/04/19	Initial release

1. Overview

1.1 Product Description

Zbit SD NAND is highly integrated flash memories with serial and random-access capability. Can be use in the device which can support SD2.0 standard. It is accessible via a dedicated serial interface optimized for fast and reliable data transmission. It has been developed to provide an inexpensive, mechanically robust storage medium in card form for multimedia consumer applications. Zbit SD NAND Flash allows the design of inexpensive players and drivers without moving parts. A low power consumption and a wide supply voltage range favors mobile, battery-powered application such as audio players, organizers, palmtops, electronic books and dictionaries. Using very effective data compression schemes such as MPEG, the SD card will deliver enough capacity for all kinds of multimedia data.

1.2 Summary

- Density: 4Gb (512MB)
- Interface: Standard SD Specification Version 2.0 with 1-I/O and 4-I/O.
- Power supply: Vcc = 2.7V - 3.6V
- Default mode: 0 - 25 MHz, up to 12.5 MB/s (using 4 parallel data lines)
- High-Speed mode: 0 - 50 MHz, up to 25 MB/s (using 4 parallel data lines)
- Operating Temperature: -40°C to +85°C
- Storage Temperature: -55°C to +125°C
- Standby Current： < 250uA
- Password protection (CMD42-LOCK_UNLOCK)
- Sophisticated system for error recovery including a powerful ECC
- Global Wear Leveling
- Power management for low power operation

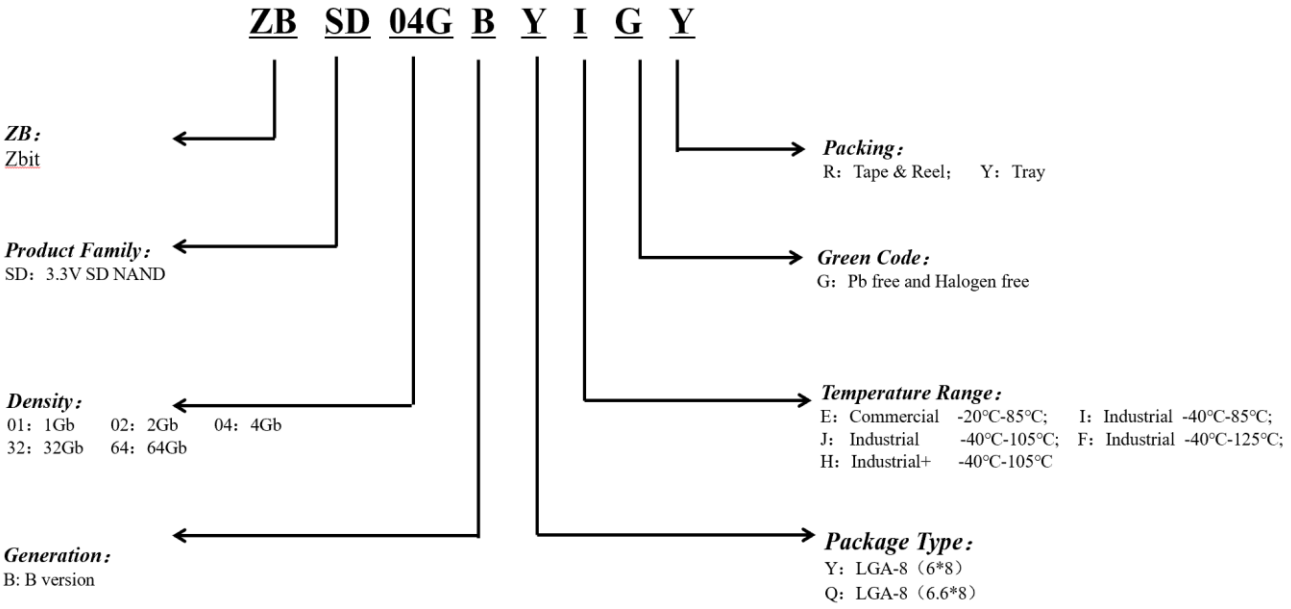
2. Product Information

2.1 Product List

Part Number	Density	User Density	Package	Shipping
ZBSD04GBYIGY	512MB	480MB	LGA-8(6*8mm)	Tray

Table 1: Product List

2.2 Part Number



3. Product Package

3.1 Pin Assignment

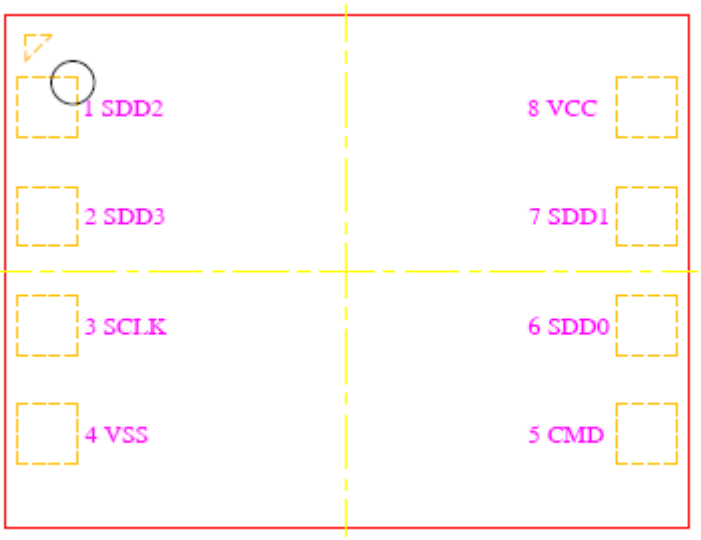


Figure 1:Top View

3.2 Signal Definition

Pin#	SD Mode		
	Name	Type[1]	Description
1	SDD2	I/O/PP	Data Line [Bit 2]
2	SDD3[2]	I/O/PP	Data Line [Bit 3]
3	SCLK	I	Clock
4	VSS	S	Supply voltage ground
5	CMD	PP	Command/Response
6	SDD0	I/O/PP	Data Line [Bit 0]
7	SDD1	I/O/PP	Data Line [Bit 1]
8	VCC	S	Supply voltage

Table 2: Pin Assignment

Note:

1) S: power supply; I: input; O: output using push-pull drivers; PP: I/O using push-pull drivers.
2) The extended SDD lines (SDD1-SDD3) are input on power up. They start to operate as SDD lines after SET_BUS_WIDTH command. The Host shall keep its own SDD1-SDD3 lines in input mode, as well, while they are not used. It is defined so, in order to keep compatibility to SDNAND.

3.3 Package Dimension

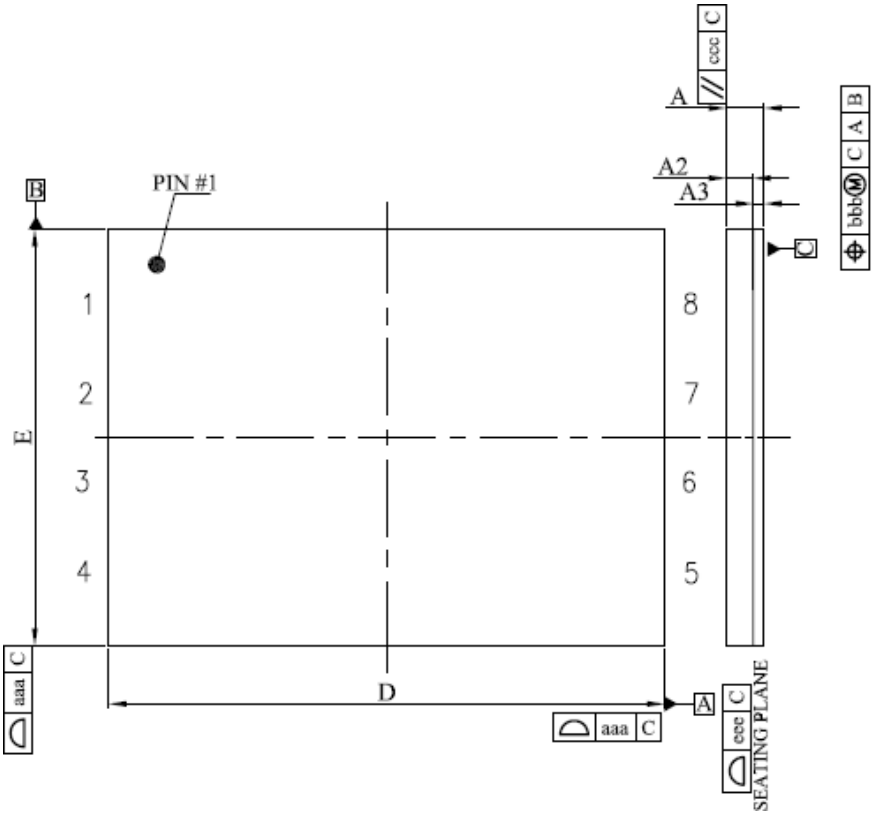


Figure 2: Top View and Side View

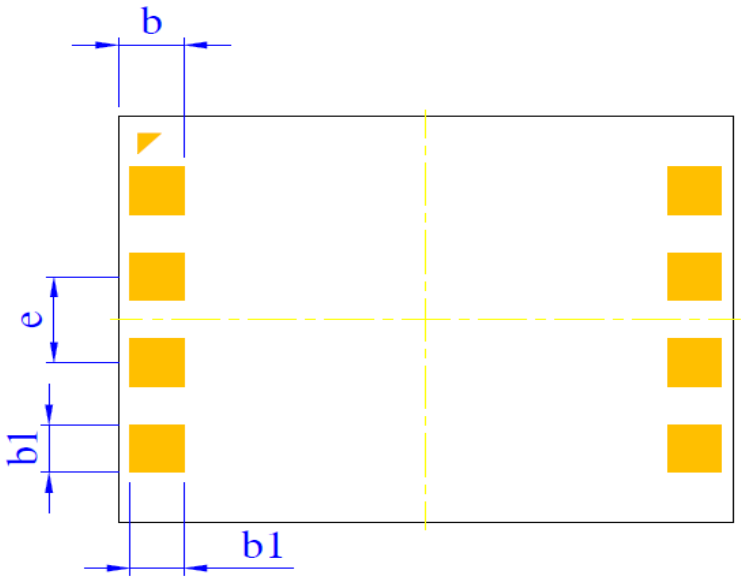


Figure 3: Bottom View

Item		Symbol	DIMENSION (mm)		
			MIN.	Normal	MAX
Total height		A	0.75	0.80	0.85
Mold thickness		A2	0.60	0.62	0.63
SBT thickness		A3	0.15	0.18	0.21
Lead width		b	0.80	0.85	0.90
Lead width		b1	0.35	0.40	0.45
Package size	X	D	7.90	8.00	8.10
	Y	E	5.90	6.00	6.10
Lead pitch		e	1.27BSC		
Package profile of a surface		aaa	0.25		
Lead position		bbb	0.10		
Parallelism		ccc	0.10		
Package profile of a surface		eee	0.08		

Table 3: Package Dimension

4. Performance

4.1 Sequential Performance

Item		Parameter	Value (MB/s)
Sequential Speed	**HD Bench (100MB)**	Read	18.2
		Write	5.7
	Crystal Disk Mark (100MB)	Read	19
		Write	6
	ATTO Disk Benchmark(128MB)	Read	19
		Write	6
	H2 Test	Read	18
		Write	5.6

Table 4: Sequential Performance

4.2 Random Performance

Item		Parameter	Value (IOPS)
Random Speed	**IO Meter (100MB)**	Read	1,890
		Write	17

Table 5: Random Performance

5. DC Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
VIL	Input low voltage		VSS-0.3		0.25VCC	V
VIH	Input high voltage		0.635VCC		VCC+0.3	V
VOL	Output low voltage	IOL=100uA@VCC_min				V
VOH	Output high voltage	IOH=100uA@VCC_min	0.75VCC			V
IIN	Input leakage	VIN=VCC or 0	-10	±1	10	μA

IOUT	Tri-state output leakage current		-10	±1	10	μA
ISTBY	Standby current	Clock stop		0.17	0.20	mA
IOP	Operation current	3.3V@50MHz Write		26	50	mA
		3.3V@50MHz Read		23	50	mA

Table 6: DC Characteristics

6. Operational Environment

Parameter	**Range**	
Temperature	Operating	-40℃~85℃
	Non-Operating	-55℃~125℃
Humidity	Operating	25% to 85%, non-condensing
	Non-Operating	25% to 85%, non-condensing
Electrostatic Discharge (ESD)	IEC 61000-4-2 contact discharge: +/- 2[kV] and +/- 4[kV] 150[pF],330[Ohm] air discharge: up to +/- 15[kV] 150[pF], 330[Ohm]	

Table7 : Operational Environment

7. Reference Design

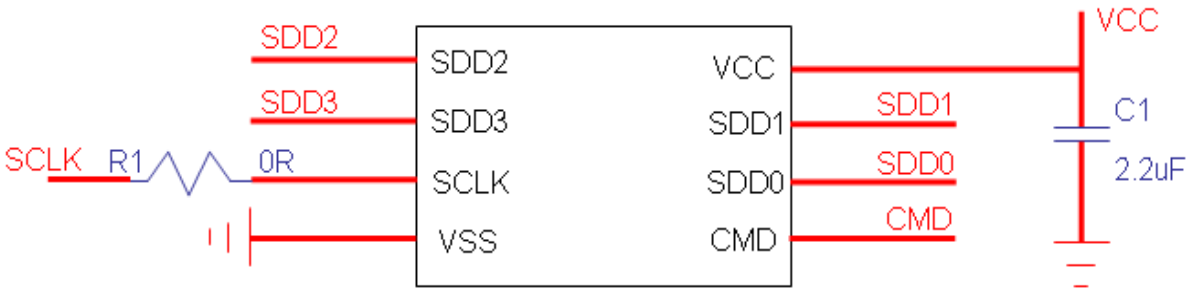


Figure 4: Recommended Schematic

Note：

1) SCLK should be reserved a position for a 0 ohm resistor.
2) Capacitor C1 should be connected with VCC as closely as possible.
3) We recommend that SDD0, SDD1, SDD2, SDD3, SCLK, CMD should be surrounded by GND. If not, please make sure the distance between lines is 2 times wider than the line width.
4) The pads in the middle are fixed, please connect GND.