



# Analysis and Solution of Abnormal Fault of Data Storage Based on NAND-flash

Zhao Long\*, Shen Xiaohe, Chen Geng, Hu Xiaoxi

Beijing Institute of Aerospace Control Devices, Beijing, China

**Email address:**

15611796238@163.com (Zhao Long), shenxiaohe2008@163.com (Shen Xiaohe), chengeng191@163.com (Chen Geng),

Huux615@126.com (Hu Xiaoxi)

\*Corresponding author

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**Abstract:** NAND-flash memory has the advantages of large capacity and fast rewriting speed. It is suitable for the storage of large amounts of data and is often used as an online storage device for embedded products. However, NAND-flash has the problems of bad blocks and other insufficient reliability. In a certain aerospace model temperature/strain measurement system, the NAND-flash memory is erased and written through DSP software, and the strain/temperature measurement data collected by the sensor is stored in real time. After the system was powered on many times and completed data collection and decoding, it was found that the data stored in the NAND-flash had abnormal faults. By analyzing the test phenomenon and failure mechanism, the failure problem is attributed to the fact that the data in the NAND-flash is not erased, and it is coupled with the newly written data, and it is finally located because the data in the original data address cannot be effectively erased when the data address is stored. Coupling also occurred, resulting in an error in the data address, and the data was coupled after power-on again. Based on the above-mentioned reasons, this paper proposed a troubleshooting method and conducted a test. The verification was successfully passed and the problem was resolved. This method has high reference significance in the large-capacity and high-reliability data storage of NAND-flash in the field of aerospace models.

**Keywords:** NAND-flash, Data Exception, Fault Analysis

## NAND-flash

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15611796238@163.com (赵龙), shenxiaohe2008@163.com (申小禾), chengeng191@163.com (陈赓), Huux615@126.com (胡晓曦)

NAND-flash

NAND-flash

NAND-flash

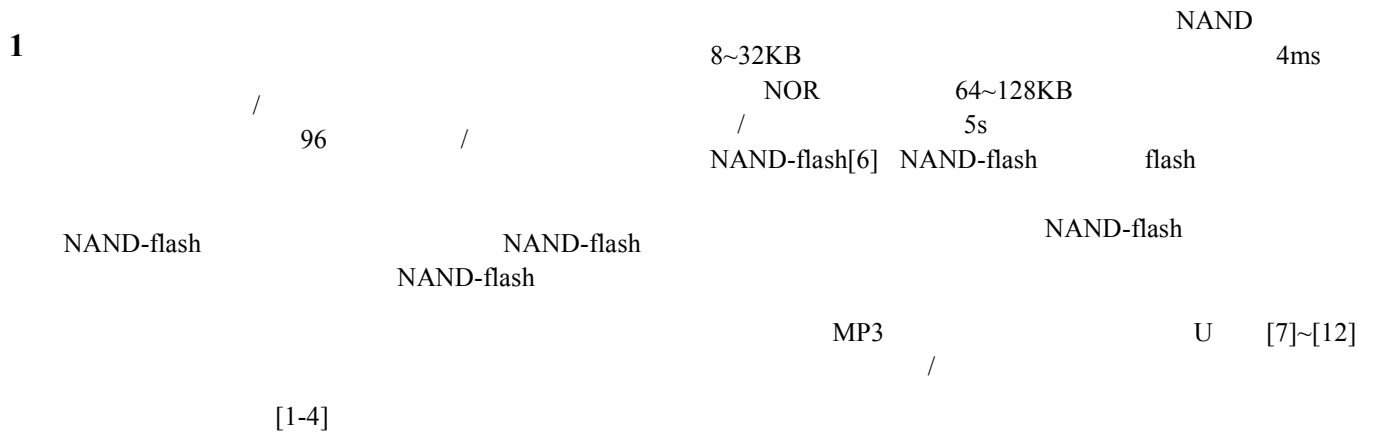
NAND-flash

NAND-flash

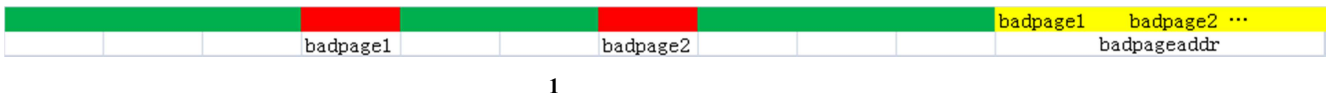
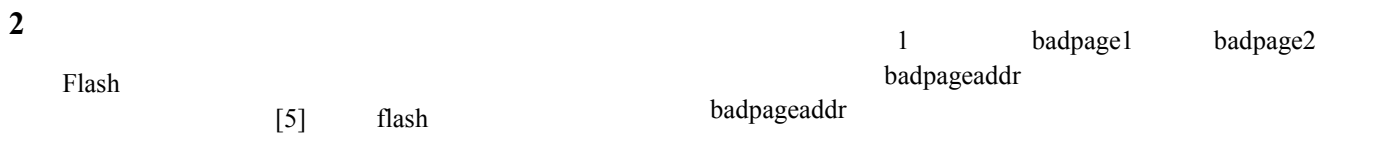
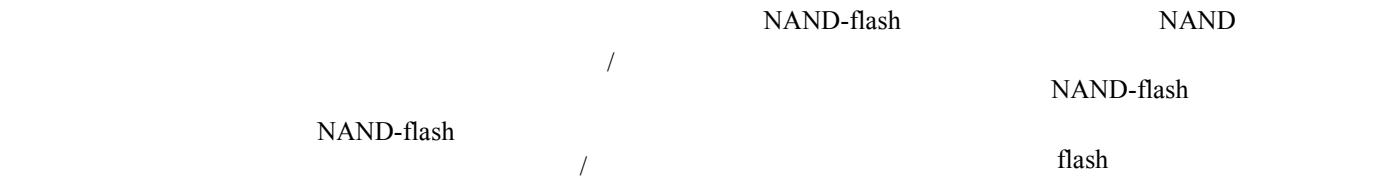
NAND-flash

DSP

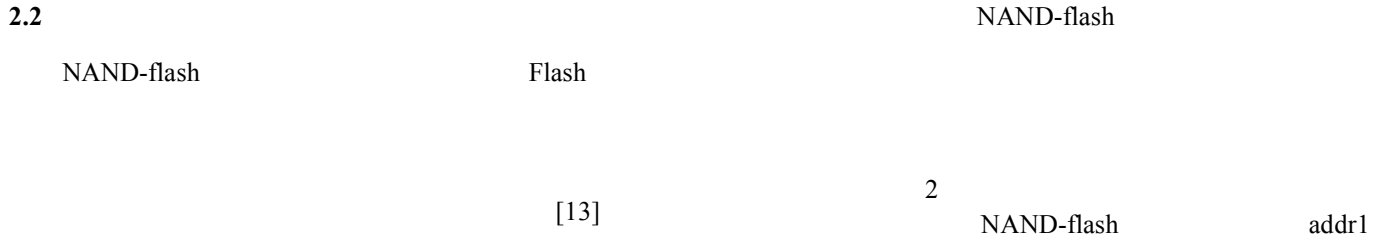
NAND-flash



**2.1**



1



2

3

3.1

3

2019-1-10:0:0

2019-0-00:0:0

/

31388	2019-12-6 13:47:36	932	229597	30.4375	30.75	CF01F81	CH1:	1533.655	1540.7	1547.982	1554.652	1559.421	1564.631
31389	2019-12-6 13:47:36	982	229598	30.4375	30.75	11401F81	CH1:	1533.654	1540.701	1547.982	1554.652	1559.421	1564.631
31390	2019-12-6 13:47:37	32	229599	30.4375	30.75	15901F81	CH1:	1533.654	1540.7	1547.982	1554.652	1559.421	1564.632
31391	2019-12-6 13:47:37	82	229600	30.4375	30.75	19E01F81	CH1:	1533.654	1540.7	1547.982	1554.653	1559.421	1564.632
31392	2019-0-0 0:0:0	288	1	20	20	2081	CH1:	1525	1525	1525	1525	1525	1525
31393	2019-0-0 0:0:0	346	2	20	20	4502081	CH1:	1525	1525	1525	1525	1525	1525
31394	2019-0-0 0:0:0	384	3	20	20	8A02081	CH1:	1525	1525	1525	1525	1525	1525
31395	2019-0-0 0:0:0	386	4	20	20	CF02081	CH1:	1525	1525	1525	1525	1525	1525
31396	2019-0-0 0:0:0	496	5	20	20	11402081	CH1:	1525	1525	1525	1525	1525	1525
31397	2019-0-0 0:0:0	546	6	20	20	15902081	CH1:	1525	1525	1525	1525	1525	1525
31398	2019-0-0 0:0:0	592	7	20	20	19E02081	CH1:	1525	1525	1525	1525	1525	1525
31399	2019-0-0 0:0:0	642	8	20	26.25	2181	CH1:	1525	1525	1525	1525	1525	1525
31400	2019-0-0 0:0:0	696	9	26.1875	26.25	4502181	CH1:	1525	1525	1525	1525	1525	1525

3

4

36085	2019-12-6 9:36:43	142	4630	26.3125	26.25	CF0BE83	CH1:	1525	1525	1525	1525	1525	1525
36086	2019-12-6 9:36:43	248	4631	26.3125	26.25	1140BE83	CH1:	1525	1525	1525	1525	1525	1525
36087	2019-12-6 9:36:43	554	4632	26.3125	26.25	1590BE83	CH1:	1525	1525	1525	1525	1525	1525
36088	2019-12-6 9:36:43	604	4633	26.3125	26.25	19E0BE83	CH1:	1525	1525	1525	1525	1525	1525
36089	2019-12-6 9:36:43	654	4634	26.3125	26.25	0BF83	CH1:	1525	1525	1525	1525	1525	1525
36090	2019-12-6 10:04:18	432	4635	28.4375	28.75	450BF83	CH1:	1525	1525	1525	1525	1525	1525
36091	2019-12-6 10:04:18	528	4636	28.4375	28.75	8A0BF83	CH1:	1525	1525	1525	1525	1525	1525
36092	2019-12-6 10:04:19	840	4637	28.4375	28.75	CF0BF83	CH1:	1525	1525	1525	1525	1525	1525
36093	2019-12-6 14:46:40	964	4702	28.4375	28.8125	1140BF83	CH1:						
36094	2019-12-6 14:46:41	14	4703	28.4375	28.8125	1590BF83	CH1:						
36095	2019-12-6 14:46:41	64	4704	28.4375	28.8125	19E0BF83	CH1:						
36096	2019-12-6 14:46:41	114	4705	28.4375	28.8125	0C083	CH1:						
36097	2019-12-6 14:46:41	164	4706	28.4375	28.8125	450C083	CH1:						

4

3.2

0

NAND-flash

0 1 0 0 1  
&

1 1

1 4701 flash

1

flash	16	flash	16	16
229601	1	380E1	1	
229602	2	380E2	2	
229603	3	380E3	3	
229604	4	380E4	4	
229605	5	380E5	5	
229606	6	380E6	6	
229607	7	380E7	7	
229608	8	380E8	8	
229609	9	380E9	9	
229610	10	380EA	A	
229611	11	380EB	B	
229612	12	380EC	C	
229613	13	380ED	D	
229614	14	380EE	E	
229615	15	380EF	F	
229616	16	380F0	10	
229617	17	380F1	11	
229618	18	380F2	12	
229619	19	380F3	13	
229620	20	380F4	14	

flash			16	flash			16	16
229621	21	15		380F5		15		
229622	22	16		380F6		16		
229623	23	17		380F7		17		
229624	24	18		380F8		18		
229625	25	19		380F9		19		
229626	26	1A		380FA		1A		
229627	27	1B		380FB		1B		
229628	28	1C		380FC		1C		
229629	29	1D		380FD		1D		
229630	30	1E		380FE		1E		
229631	31	1F		380FF		1F		
229632	32	20		38100		0		
229633	33	21		38101		1		
...	.....	.....	.....	.....	.....	.....	.....	
4701	234301	4701	125D	3933D		121D		

addr1

addr2

flash

addr1 addr2

/

NAND-flash

上电后采集的温度/应变数据			上电初始地址		addr1	addr2
addr2b	addr1	addr2a			块地址存储区	

5

addr1 addr2

3

addr2a addr1

addr2b

2~3

addr1

addr2a

addr2b

NAND-flash

/

addr2 addr2b

addr2a,

addr2a=addr1+

1

0xff

addr2b=addr1-

2

addr2b addr2a

addr2<addr2b<addr1 flash

addr1 addr2

1 0

0 1

addr1 addr2

addr1+

addr2a+

NAND-flash

/

/

4

5

/

NAND-flash

NAND-flash

NAND-flash

NAND-flash

/

typicaltime

NAND-flash

maxtime

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				[7]		Nand Flash ARM	
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				[8]		NAND Flash	
					[J]	2006.4	
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	[J]		2015.07			2008.02	
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	2009.02		[J]			2003.08	
[3]	NAND Flash		[J]	[11]			
	2010.09				[J],	2010.08	
[4]		NAND Flash		[12]	NAND Flash	[J]	2012.05
	[J]	2011.05					
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