

TF Card Product Specifications

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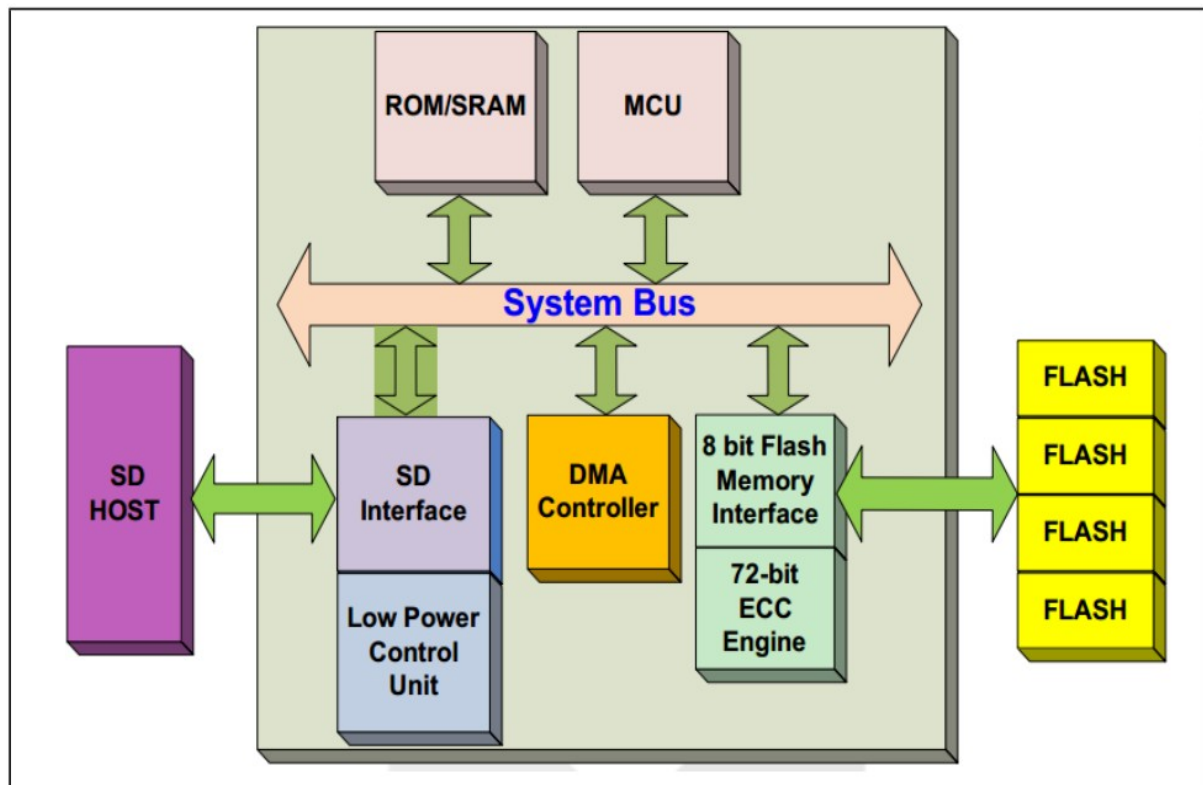
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Chapter 1 Product Overview

1.1. Product Overview

The full name of the TF card is Trans Flash, also known as T-Flash card or Micro SD. It adopts the latest packaging technology and is a new generation of memory device based on semiconductor flash memory. It is widely used in industries such as consumer grade storage cards, industrial grade storage cards, dash cam storage cards, and high durability video storage cards. This TF card is based on an 8-pin interface and is designed to operate at a maximum frequency of 50MHz. The interface allows for easy integration into any design regardless of the type of microprocessor used. In addition to the interface, it also provides backup communication - SPI standard protocol.



(Figure 1)

1.2. Product characteristics

- Capacity: 32GB 64GB 128GB
- ROHS, Reach compliant
- Small volume: 11mm (L) * 15mm (W) * 1mm (H)
- Light weight: 0.25g
- Fast data transmission: C10, and U3
- Hot swapping: supported
- Voltage range: 2.7V-3.6V
- Customization: Provide solution locking and FW customization services for different usage scenarios
- High durability: can support 12000 hours of uninterrupted storage

- Built in write protection (permanent and temporary)
- Memory field error correction
- Support card detection and removal
- High cost-effectiveness and reliability
- Bus speed mode
 - DS Default Speed mode: 3.3V signaling, frequency up to 25MHz, up to 12.5MB/sec
 - HS High Speed mode: 3.3V signaling, frequency up to 50MHz, up to 25MB/sec
 - SDR12-1.8V signaling, frequency up to 25MHz, up to 12.5MB/sec
 - SDR25-1.8V signaling, frequency up to 50MHz, up to 25MB/sec
 - SDR50-1.8V signaling, frequency up to 100MHz, up to 50MB/sec
 - SDR104-1.8V signaling, frequency up to 208MHz, up to 104MB/sec
 - DDR50-1.8V signaling, frequency up to 50MHz, sampled on both clock edges, up to 50MB/s

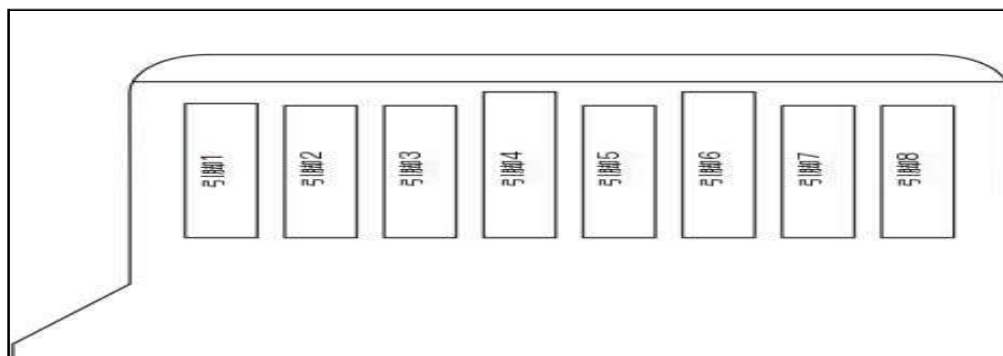
1.3. Appearance diagram



(Figure 2)

Chapter 2 Function Introduction

2.1. Pin Definition



(Figure 3)

SD Mode			
Pin	name	type	describe
1	DAT2	I/O/P	Data bit 2
2	CD/Dat3	I/O/PP	Card detection/data bit 3
3	CMD	PP	Command/Reply
4	VDD	S	Supply voltage
5	CLK	I	clock
6	Vss	S	land
7	DAT0	I/O/P	Data bit 0
8	DAT1	I/O/P	Data bit 1

SPI Mode			
Pin	Name	Type	Describe
1	RSV		retain
2	CS	I	Chip Selection
3	DI	I	data input
4	VDD	S	power supply
5	SCLK	I	clock
6	VSS	S	electrically
7	DO	O/PP	data input
8	RSV	I	retain

2.2. Key Material Information

Capacity	Usable Capacity	Format	Rating
32GB	29GB	FAT32	C10, U3
64GB	59GB	exFAT	C10, U3
128GB	119GB	exFAT	C10, U3

2.3 Reading and Writing Speed

Capacity	Category	Grade	Spec	Sample Test				
				#1	#2	#3	#4	#5
32GB	Write speed (MB/S)	U3	≥ 30	33.5	36.5	35.3	34.1	32.4
	Read speed (MB/S)		≥ 80	82.5	88.2	84.7	87.1	81.9
64GB	Write speed (MB/S)	U3	≥ 30	34.1	35.5	37.9	33.8	32.9
	Read speed (MB/S)		≥ 80	85.7	82.5	84.6	84.3	80.8
128GB	Write speed (MB/S)	U3	≥ 30	37.5	36.7	38.3	35.7	39.5
	Read speed (MB/S)		≥ 80	85.3	83.5	86.6	85.9	88.8

2.4 Current

Capacity	Category	Spec	Sample Test				
			#1	#2	#3	#4	#5
32GB	Read/write current (mA)	≤ 300	115	117	120	113	114
	Standby current (mA)	≤ 80	49	48	51	56	45
64GB	Read/write current (mA)	≤ 300	120	117	113	115	121
	Standby current (mA)	≤ 80	49	52	49	53	48
128GB	Read/write current (mA)	≤ 300	117	115	120	112	114
	Standby current (mA)	≤ 80	48	50	54	55	49

2.5 Mean time to failure

Mean time to failure	100,000 hours
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Chapter 3 Environmental Requirements

3.1. Storage Environment

Temperature	Temperature	Remark
-25℃～ 85℃	10%RH～ 90%RH	Non - Condensing

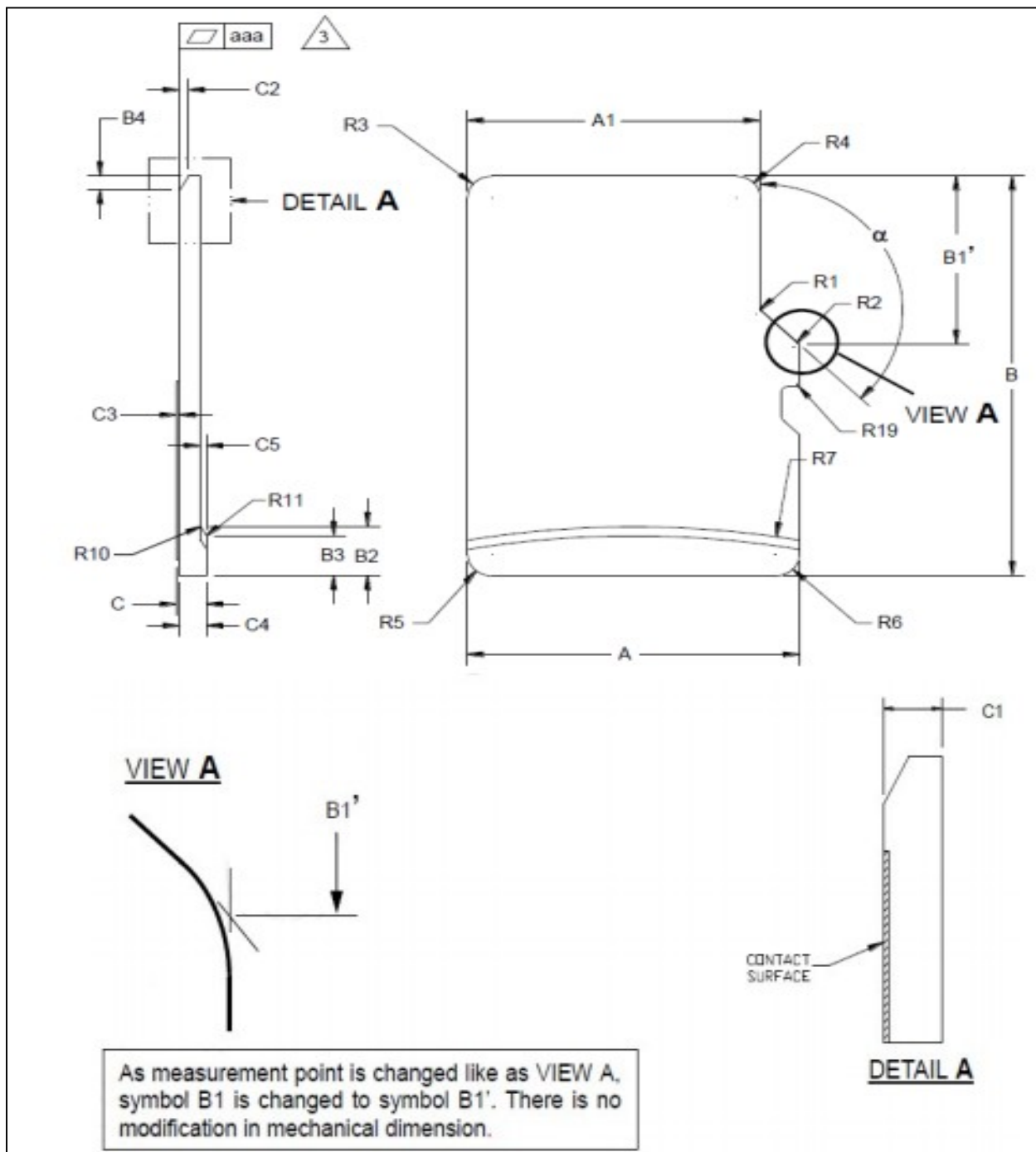
3.2. Work environment

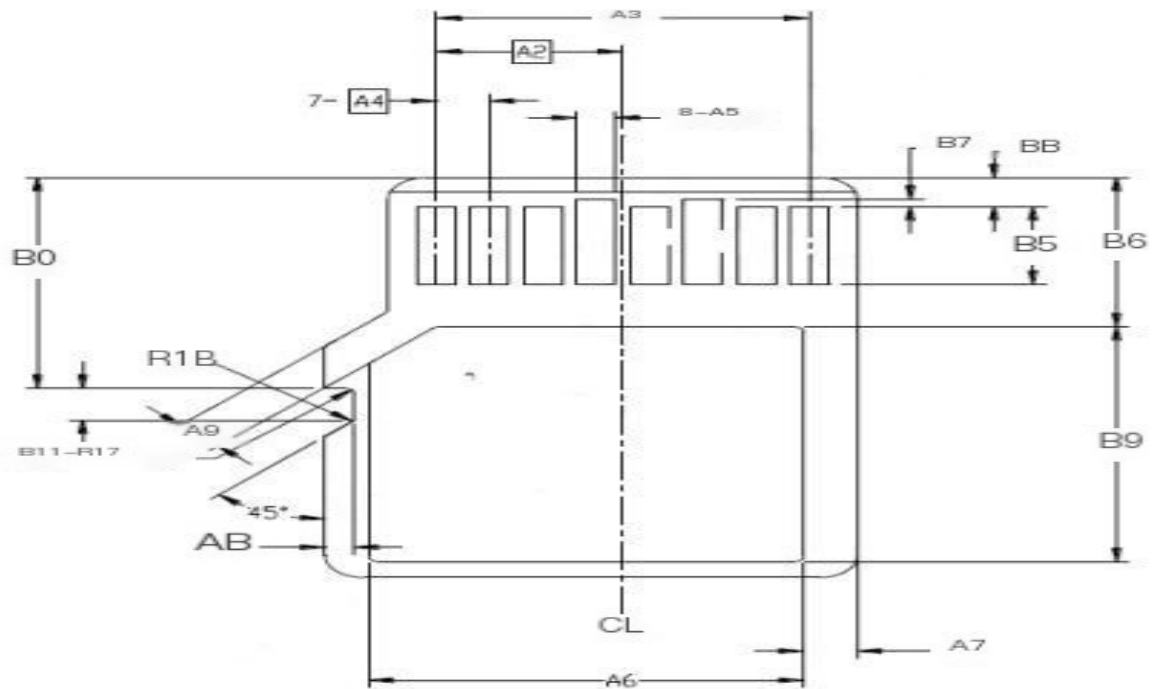
Temperature	Temperature	Remark
0℃～ 70℃	10%RH～ 90%RH	Non - Condensing

Chapter 4 Reliability Test

Experimental projects	Test conditions	Sample No					Result
		#1	#2	#3	#4	#5	
Drop	The product fell from a height of 1m, twice on both sides and four edges, total test 12 times	Okay	Okay	Okay	Okay	Okay	Pass
High temperature and humidity	Temperature: 85 ± 2 °C, humidity: 85 ± 2% RH, product stored for 48hours in non working condition	Okay	Okay	Okay	Okay	Okay	Pass
Low temperature storage	Temperature -30 °C, product stored for 16 hours under non working conditions	Okay	Okay	Okay	Okay	Okay	Pass
High and low temperature cycling	70 °C for 1 hour to -30 °C for 1 hour, with a temperature conversion time of 5 minutes, the product does not power on and test 10 cycles	Okay	Okay	Okay	Okay	Okay	Pass
Vibration	Vibration frequency 10-55Hz, vibration time 30 minutes	Okay	Okay	Okay	Okay	Okay	Pass
Salt mist	5% hydrochloric acid solution, atomized for 24 hours	Okay	Okay	Okay	Okay	Okay	Pass
Electrostatic discharge	8KV, contact discharge, 5 times positive and 5 times negative	Okay	Okay	Okay	Okay	Okay	Pass

Chapter 5 Product Structure Diagram





COMMON DIMENSION				NOTE
SYMBOL	MIN	NOM	MAX	
A	10.90	11.00	11.10	
A1	9.60	9.70	9.80	
A2	-	3.85	-	BASIC
A3	7.60	7.70	7.80	
A4	-	1.10	-	BASIC
A5	0.75	0.80	0.85	
A6	-	-	8.50	
A7	0.90	-	-	
A8	0.60	0.70	0.80	
A9	0.80	-	-	
A10	1.35	1.40	1.45	
A11	6.50	6.60	6.70	
A12	0.50	0.55	0.60	
A13	0.40	0.45	0.50	
B	14.90	15.00	15.10	
B1*	6.13	6.23	6.33	
B2	1.64	1.84	2.04	
B3	1.30	1.50	1.70	
B4	0.42	0.52	0.62	
B5	2.80	2.90	3.00	
B6	5.50	-	-	
B7	0.20	0.30	0.40	
B8	1.00	1.10	1.20	
B9	-	-	9.00	
B10	7.80	7.90	8.00	
B11	1.10	1.20	1.30	
B12	3.60	3.70	3.80	
B13	2.80	2.90	3.00	
B14	8.20	-	-	
B15	-	-	6.20	
C	0.90	1.00	1.10	
C1	0.60	0.70	0.80	
C2	0.20	0.30	0.40	
C3	0.00	-	0.15	
C4	0.80	-	1.10	
C5	0.15	-	-	
D1	1.00	-	-	
D2	1.00	-	-	
D3	1.00	-	-	
R1	0.20	0.40	0.60	
R2	0.20	0.40	0.60	
R3	0.70	0.80	0.90	
R4	0.70	0.80	0.90	
R5	0.60	0.80	0.90	
R6	0.60	0.80	0.90	
R7	29.50	30.00	30.50	
R10	-	0.20	-	
R11	-	0.20	-	
R17	0.10	0.20	0.30	
R18	0.20	0.40	0.60	

Notes:

1. DIMENSIONING and TOLERANCING per ASME Y14.5M-1994.
2. Dimensions are in millimeters.
3. COPLANARITY is additive to C1 MAX thickness.
4. All edges shall not be sharp as tested per UL1439 "Test for Sharpness of Edges on Equipment."
5. Refer to Appendix E about test method of warpage.
6. As measurement point is changed, symbol B1 is changed to symbol B1*.
7. C4 and C5 are added from Version 4.00.