Loongtion®

Industrial TF(microSD) Datasheet

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Revision History

Revision	Date	Description
Rev 1.0	2024-12-10	Initial release

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1. Overview

The TF (microSD) card is a standard-form-factor flash memory card designed for applications demanding high performance and high reliability. It is suitable for use in consumer electronics, automotive electronics, IoT devices, medical equipment, and other industrial applications.

The card interface is compliant with the SD 3.0 protocol standard. It incorporates a high-capacity NAND Flash from Yangtze Memory Technologies (YMTC) and a high-performance fully domestic controller (Model 2100). The two components work in conjunction to perform data read/write and storage functions.

2. Product List

Table 1. Ordering Information

Capacity	Part Number	Dimensions	Temperature	Notes
8 GB	YIDU008TUS-S	11 mm × 15 mm	−40 °C to +85 °C	SLC mode
16 GB	YIDU016TUS-S			
32 GB	YIDU032TUT-S			TLC mode
64 GB	YIDU064TUT-S			
128 GB	YIDU128TUT-S			
256 GB	YIDU256TUT-S			

3. Product Features

- Flash type: TLC
- Supports full SD bus widths (1-bit / 4-bit)
- Supports ECC (Error Correction Code)

3.1 Physical Characteristics

3.1.1 TF Card Package Dimensions

- Physical dimensions: standard TF (microSD) card form factor

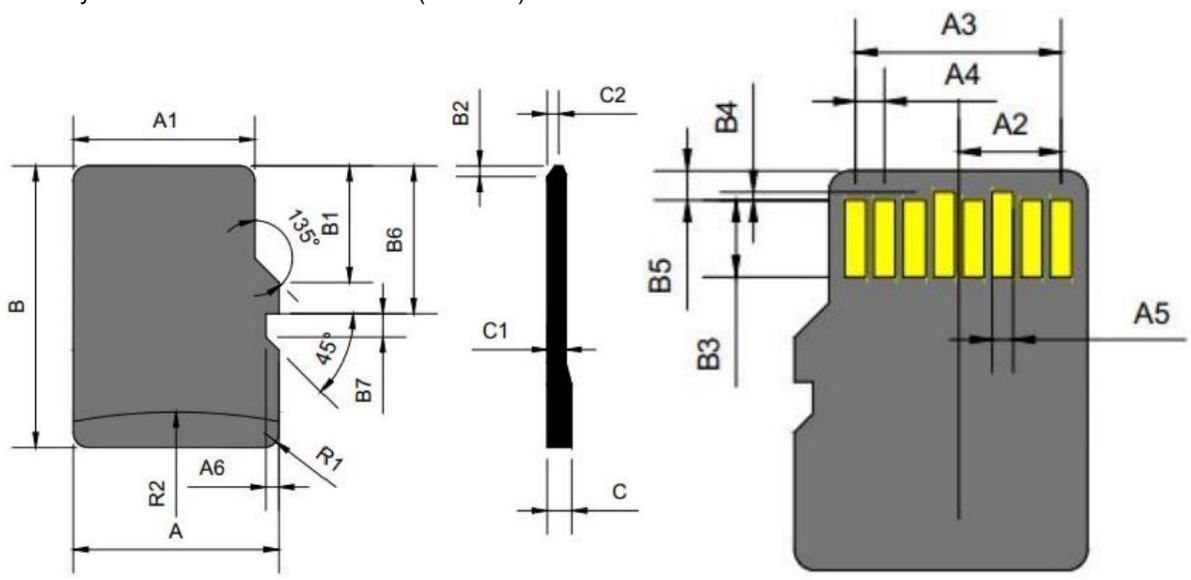


Figure 1. Package Dimensions (TF 11 mm × 15 mm)

Table 2. Package Dimensions

microSD Standard Unit: mm				
Dimension	Min	Typ	Max	Notes
A	10.90	11.00	11.10	
A1	9.60	9.70	9.80	
A2		3.85		Reference
A3	7.60	7.70	7.80	
A4		1.10		Reference
A5	0.75	0.80	0.85	
A6	0.60	0.70	0.80	
B	14.90	15.00	15.10	
B1	6.13	6.23	6.33	
B2	0.42	0.52	0.62	
B3	2.80	2.90	3.00	
B4	0.20	0.30	0.40	
B5	1.00	1.10	1.20	
B6	7.80	7.90	8.00	
B7	1.10	1.20	1.30	
R1	0.70	0.80	0.90	
R2	29.50	30.00	30.50	
C	0.90	1.00	1.10	
C1	0.60	0.70	0.80	
C2	0.20	0.30	0.40	

3.1.2 TF Card Pin Assignment

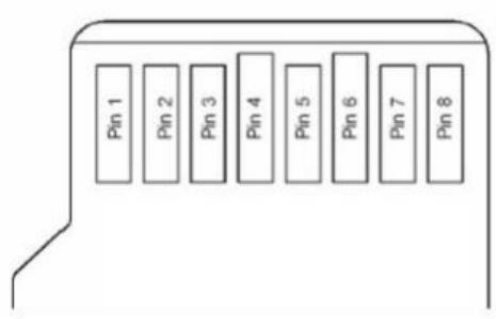


Figure 2. Pin Assignment

- SD Mode Pin Descriptions

Table 3. Pin Descriptions (SD Mode)

Pin	Name	Type	Description
1	DAT2	I/O	Data line 2
2	CD/DAT3	I/O	Card detect / Data line 3
3	CMD	PP	Command / Response
4	VIO	S	Power supply
5	CLK	I	Clock
6	VSS	S	Ground
7	DAT0	I/O	Data line 0
8	DAT1	I/O	Data line 1

Notes:

1) S: power supply; I: input; O: output, push-pull driver; PP: I/O, push-pull driver
2) DAT1–DAT3 are internally pulled up; data bus width is configured via command
3) Pin 3 is the CMD pin with a 50 kΩ internal pull-up

- SPI Mode Pin Descriptions

Table 4. Pin Descriptions (SPI Mode)

Pin	Name	Type	Description
1	RSV	—	Reserved
2	CS	I	Chip select (active low)
3	DI	I	Data input
4	VIO	S	Power supply
5	SCLK	I	Clock
6	VSS	S	Ground
7	DO	O	Data output

8	RSV	—	Reserved

3.2 Electrical Characteristics

- Operating voltage range: VDD = 2.7 V to 3.6 V (typical 3.3 V)
- DC electrical characteristics

Table 5. DC Electrical Characteristics

Parameter		Symbol	Min	Max	Unit	Notes
		VDD	2.7	3.6	V	
Input voltage	High level	VIH	0.625×VSDIO	VSDIO+0.3	V	VSDIO = 3.3 V
	Low level	VIL	−0.3	0.25×VSDIO	V	
Output voltage	High level	VOH	0.75×VSDIO		V	
	Low level	VOL		0.125×VSDIO	V	
Standby current (*)		ICC(slp)		250	μA	
Operating current (*)	Write	ICC		400	mA	
	Read	ICC		400		

Table 6. Peak Voltages and Leakage Currents

Parameter	Symbol	Min	Max	Unit	Notes
Line peak voltage		−0.3	VSDIO+0.3	V	
Pin input leakage current		−10	10	μA	
Output leakage current		−10	10	μA	

Table 7. External Components

Parameter	Symbol	Min	Max	Unit	Notes
Pull-up resistor	RCMD	10	100	kΩ	
Power filter capacitor	CC		5	μF	

Notes:

1) Operating temperature range: Ta = −40 °C to +85 °C
2) Storage temperature range: Tst = −45 °C to +90 °C