microSDHC Class 10 Card (TS8/16/32GUSDC10M)

- RoHS compliant product.
- Operating Voltage: 2.7 ~ 3.6V
- Operating Temperature: -25 ~ 85℃
- Durability: 10,000 insertion/removal cycles
- Compatible with SD Specification Ver. 3.0
- Comply with SD File System Specification Ver. 3.0
- Supports Speed Class Specification Class 10
- Supports Copy Protection for Recorded Media (CPRM) for SD-Audio
- Form Factor: 11mm x 15mm x 1mm

Description

Transcend Industrial High Capacity microSD Card series are specifically designed to meet the High Capacity, High Definition Audio and Video requirement for the latest Digital Cameras, DV Recorders, Mobile Phones, etc. The new defined Speed Class enables the host to support AV applications to perform real time recording to the micro SDHC memory card.

Placement

Pin Definition

Pin No.	SD Mode			SPI Mode		
	Name	Type	Description	Name	Type	Description
1	DAT2	I/O/PP	Data Line [Bit2]	RSV		Reserved
2	CD/DAT3	I/O/PP	Card Detect / Data Line [Bit3]	CS	I	Chip Select
3	CMD	PP	Command / Response	DI	I	Data In
4	V_{DD}	S	Supply voltage	V_{DD}	S	Supply voltage
5	CLK	I	Clock	SCLK	I	Clock
6	V_{SS}	S	Supply voltage ground	V_{SS}	S	Supply voltage ground
7	DAT0	I/O/PP	Data Line [Bit0]	DO	O/PP	Data out
8	DAT1	I/O/PP	Data Line [Bit1]	RSV		Reserved

S: Power Supply; I:Input; O:Output; PP:Push-Pull

Bus Operating Conditions

• General

Parameter	Symbol	Min.	Max.	Unit	Remark
Peak voltage on all lines		-0.3	V_{DD}+0.3	V	
All Inputs					
Input Leakage Current		-10	10	µA	
All Outputs					
Output Leakage Current		-10	10	µA	

• Power Supply Voltage

Parameter	Symbol	Min.	Max.	Unit	Remark
Supply voltage	V_{DD}	2.7	3.6	V	
Output High Voltage	V_{OH}	0.75* V_{DD}		V	I_{OH}=-100uA@V_{DD} Min.
Output Low Voltage	V_{OL}		0.125* V_{DD}	V	I_{OL}=100uA@V_{DD} Min.
Input High Voltage	V_{IH}	0.625* V_{DD}	V_{DD}+0.3	V	
Input Low Voltage	V_{IL}	V_{SS}-0.3	0.25* V_{DD}	V	
Power up time			250	ms	From 0v to V_{DD} Min.

• Current Consumption

The current consumption is measured by averaging over 1 second.

· Before first command: Maximum 15 mA

· During initialization: Maximum 100 mA

· Operation in Default Mode: Maximum 100 mA

· Operation in High Speed Mode: Maximum 200 mA

· Operation with other functions: Maximum 500 mA.

Reliability and Durability

Temperature	Operation: -25℃ / 85℃
	Storage: -40℃ (168h) / 85℃ (500h)
	Junction temperature: max. 95℃
Moisture and corrosion	Operation: 25℃ / 95% rel. humidity
	Storage: 40℃ / 93% rel. hum./500h
	Salt Water Spray: 3% NaCl/35C; 24h acc. MIL STD Method 1009
Durability	10.000 mating cycles;
Bending	10N
Torque	0.15N.m or +/-2.5 deg
Drop test	1.5m free fall
Visual inspection **Shape and form**	No warp page; no mold skin; complete form; no cavities surface smoothness <= -0.1 mm/cm² within contour; no cracks; no pollution (fat, oil dust, etc.)

• CID Register

The Card IDentification (CID) register is 128 bits wide. It contains the card identification information used during the card identification phase. Every individual flash card shall have a unique identification number. The structure of the CID register is defined in the following paragraphs:

Name	Field	Width	CID-slice
Manufacturer ID	MID	8	[127:120]
OEM/Application ID	OID	16	[119:104]
Product name	PNM	40	[103:64]
Product revision	PRV	8	[63:56]
Product serial number	PSN	32	[55:24]
reserved	--	4	[23:20]
Manufacturing date	MDT	12	[19:8]
CRC7 checksum	CRC	7	[7:1]
not used, always '1'	-	1	[0:0]

• MID

An 8-bit binary number that identifies the card manufacturer. The MID number is controlled, defined, and allocated to a SD Memory Card manufacturer by the SD-3C, LLC. This procedure is established to ensure uniqueness of the CID register.

• OID

A 2-character ASCII string that identifies the card OEM and/or the card contents (when used as a distribution media either on ROM or FLASH cards). The OID number is controlled, defined, and allocated to a SD Memory Card manufacturer by the SD-3C, LLC. This procedure is established to ensure uniqueness of the CID register.

Note:

SD-3C, LLC licenses companies that wish to manufacture and/or sell SD Memory Cards, including but not limited to flash memory, ROM, OTP, RAM, and SDIO Combo Cards.

SD-3C, LLC is a limited liability company established by Matsushita Electric Industrial Co. Ltd., SanDisk Corporation and Toshiba Corporation.

• PNM

The product name is a string, 5 ASCII characters long.

• PRV

The product revision is composed of two Binary Coded Decimal (BCD) digits, four bits each, representing an "n.m" revision number. The "n" is the most significant nibble and "m" is the least significant nibble.

As an example, the PRV binary value field for product revision "6.2" will be: 0110 0010

• PSN

The Serial Number is 32 bits of binary number.

• MDT

The manufacturing date composed of two hexadecimal digits, one is 8 bit representing the year(y)

and the other is four bits representing the month(m).

The "m" field [11:8] is the month code. 1 = January.

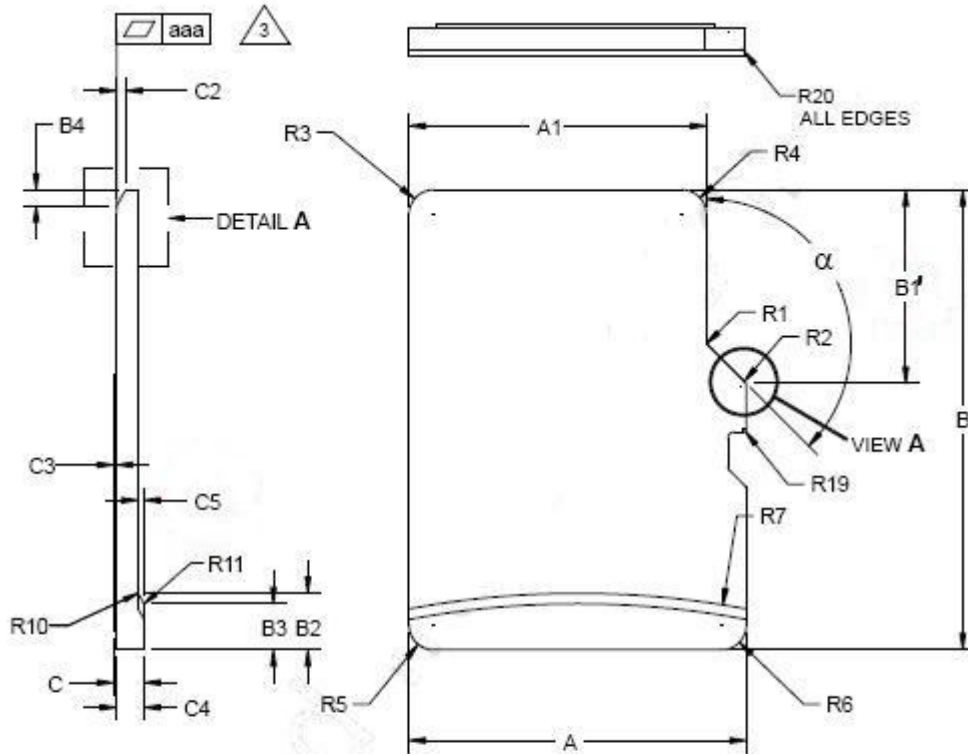The "y" field [19:12] is the year code. 0 = 2000.

As an example, the binary value of the Date field for production date "April 2001" will be:
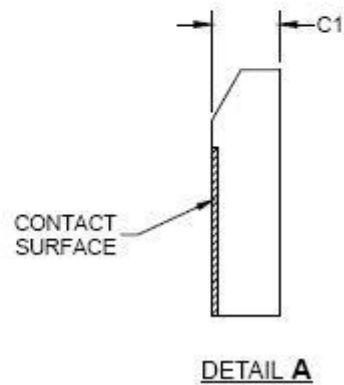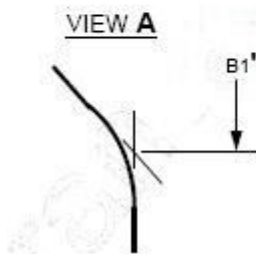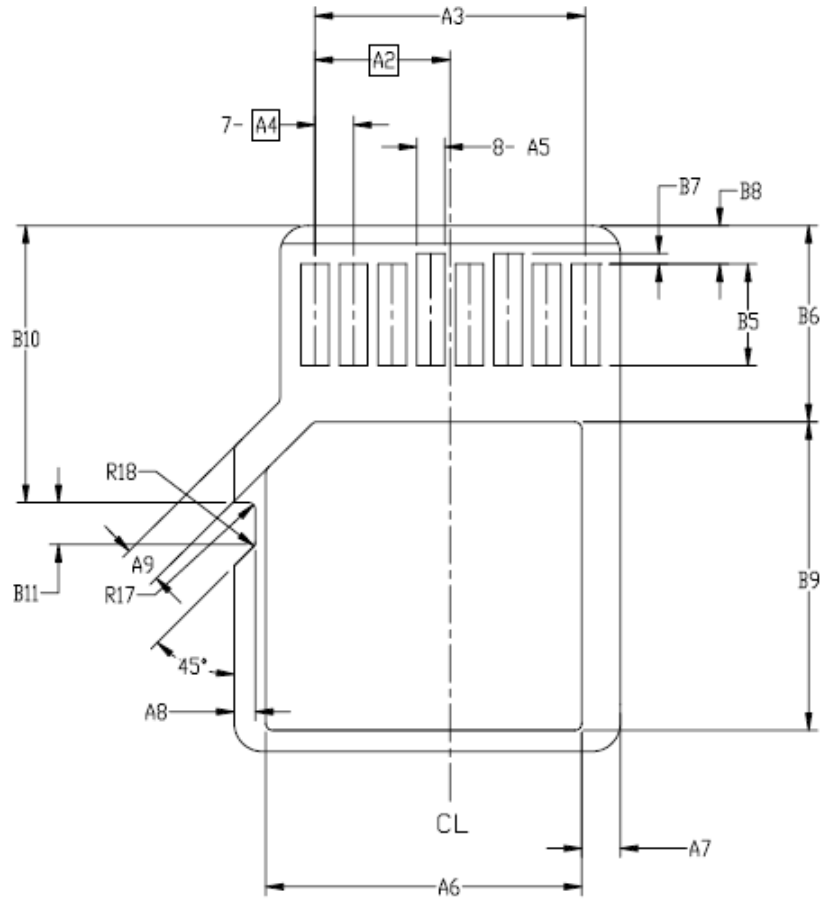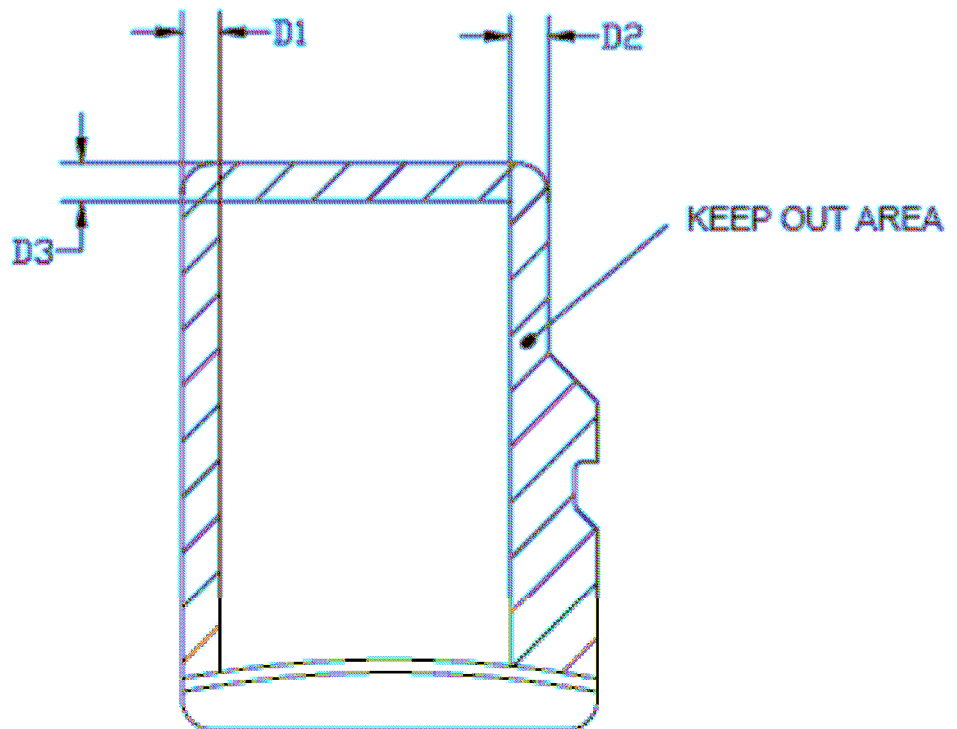
00000001 0100.

• CRC

CRC7 checksum (7 bits).

Mechanical Dimension

**Mechanical Form Factor**

Mechanical Description: Top View

Mechanical Description: Bottom View

Mechanical Description: Keep Out Area

SYMBOL	COMMON DIMENSION			NOTE
	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	-	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	
R19	0.05	-	0.20	
R20	△4	-	0.15	
α	133°	135°	137°	
aaa	-	-	0.10	

Notes:
1. DIMENSIONS 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.

microSD package: Dimensions