

Switching Diodes Silicon Epitaxial Planar

HN1D05FE

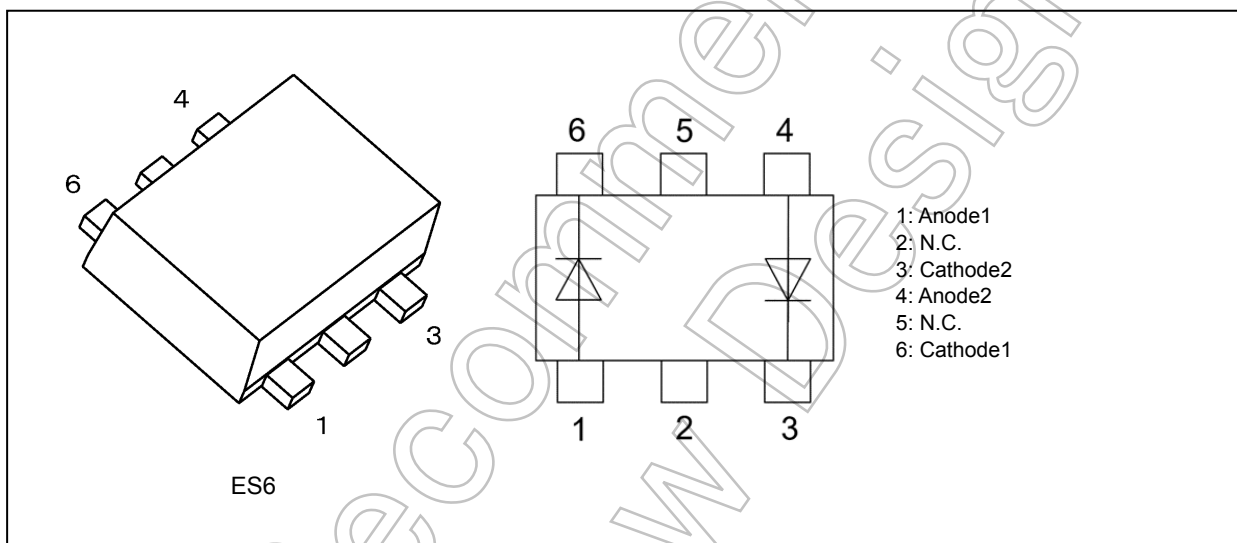
1. Applications

- High-Voltage Switching

2. Features

- (1) Small package
- (2) Low reverse current: $I_{R(2)} = 0.1 \mu\text{A}$ (max)
- (3) Low forward voltage: $V_{F(2)} = 1.0 \text{ V}$ (typ.)
- (4) Fast reverse recovery time: $t_{rr} = 0.5 \mu\text{s}$ (typ.)
- (5) Small total capacitance: $C_t = 4.3 \text{ pF}$ (typ.)

3. Packaging and Internal Circuit



Start of commercial production

2023-10

4. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$)

Characteristics	Symbol	Note	Rating	Unit
Peak reverse voltage	V_{RM}		420	V
Reverse voltage	V_R		400	V
Peak forward current	I_{FM}		300	mA
Average rectified current	I_O		100	mA
Power dissipation	P_D	(Note 1)	100	mW
Non-repetitive peak forward surge current	I_{FSM}	(Note 2)	2	A
Junction temperature	T_j		150	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to 150	$^\circ\text{C}$

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Note 1: Unit rating. Total rating = Unit rating \times 70%

Note 2: Pulse width 10 ms

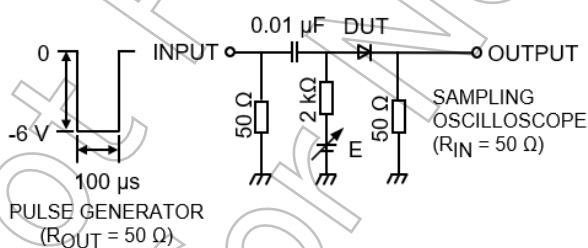
5. Usage Considerations

Be careful electric discharge with high voltage because of fine pin pitch.

6. Electrical Characteristics (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	$V_{F(1)}$	$I_F = 10\text{ mA}$	—	0.8	—	V
	$V_{F(2)}$	$I_F = 100\text{ mA}$	—	1.0	1.3	
Reverse current	$I_{R(1)}$	$V_R = 300\text{ V}$	—	—	0.05	μA
	$I_{R(2)}$	$V_R = 400\text{ V}$	—	—	0.1	
Total capacitance	C_t	$V_R = 0\text{ V}, f = 1\text{ MHz}$	—	4.3	—	pF
Reverse recovery time	t_{rr}	$I_F = 10\text{ mA}$, See Fig. 6.1	—	0.5	—	μs

INPUT WAVEFORM



OUTPUT WAVEFORM

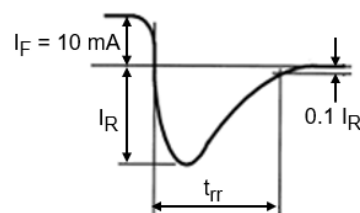
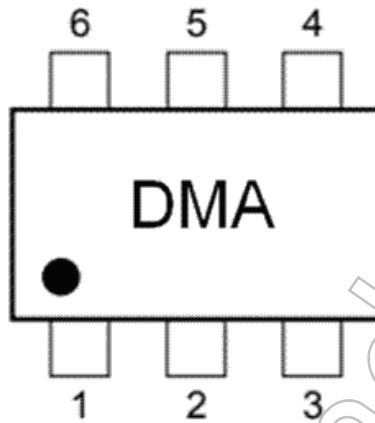


Fig. 6.1 Reverse Recovery Time (t_{rr}) Test Circuit

7. Marking



8. Characteristics Curves (Note)

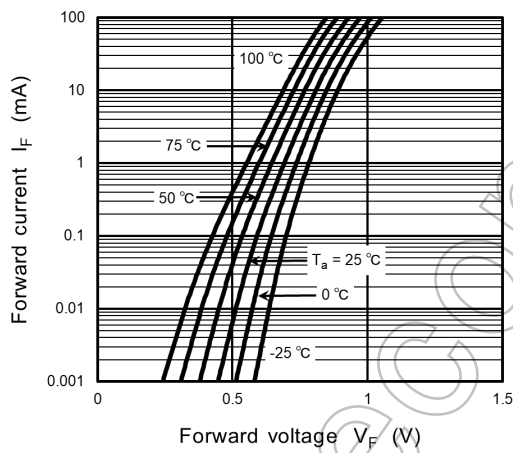


Fig. 8.1 $I_F - V_F$

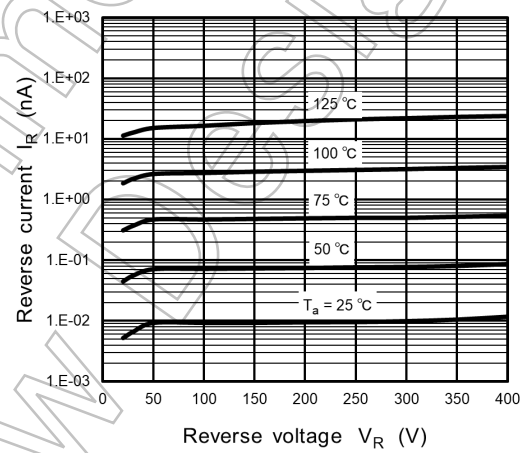


Fig. 8.2 $I_R - V_R$

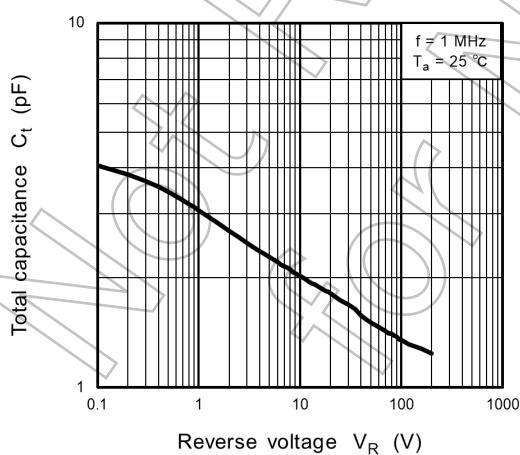


Fig. 8.3 $C_t - V_R$

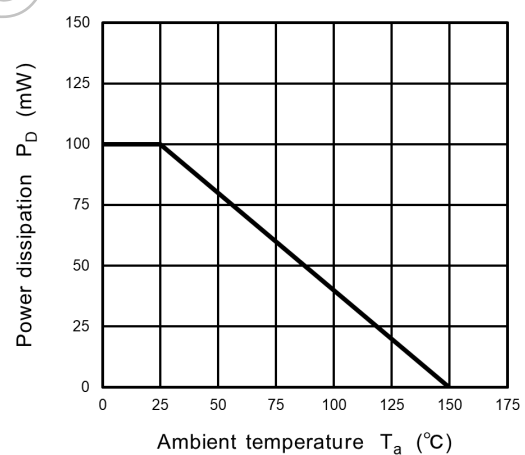
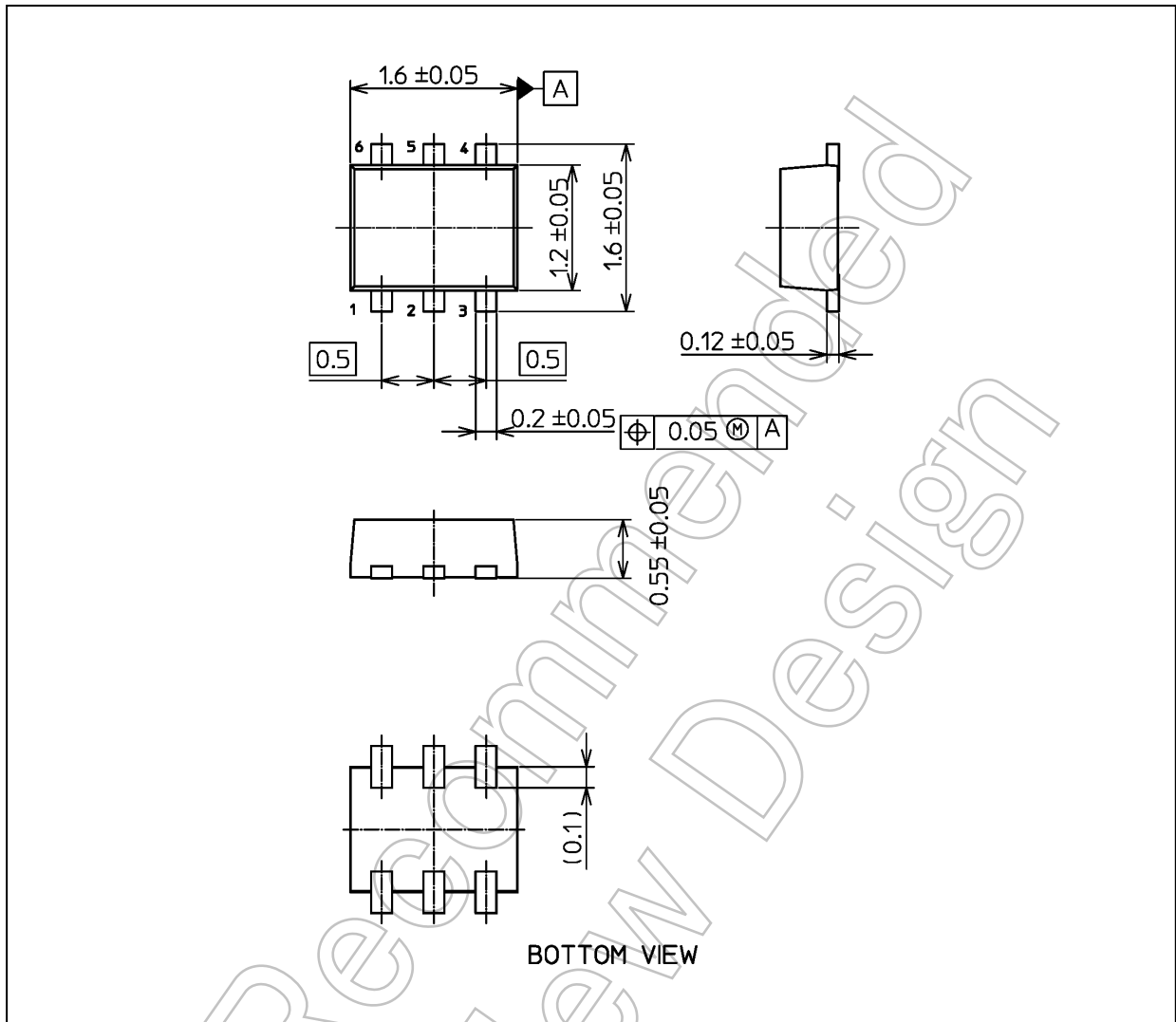


Fig. 8.4 $P_D - T_a$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 3.0 mg (typ.)

Package Name(s)
Nickname: ES6

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