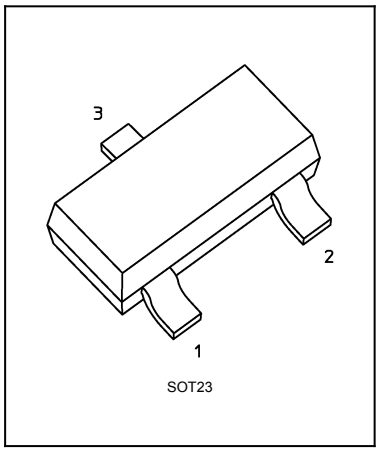
Schottky Barrier Diode Silicon Epitaxial

TBAT54,TBAT54A,TBAT54C,TBAT54S

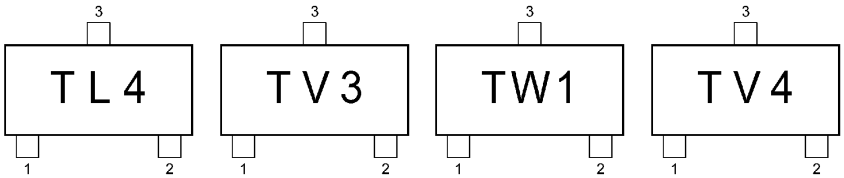
1. Applications

- Ultra-High-Speed Switching

2. Packaging



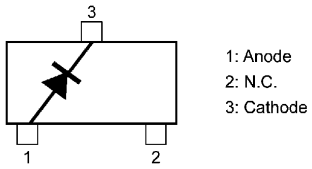
3. Marking



Part Number	Marking Code	Configuration
TBAT54	TL4	single
TBAT54A	TV3	common anode
TBAT54C	TW1	common cathode
TBAT54S	TV4	series

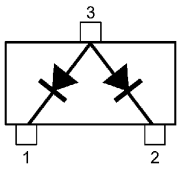
Start of commercial production
2016-04

4. Internal Circuit



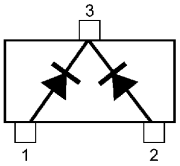
1: Anode
2: N.C.
3: Cathode

TBAT54



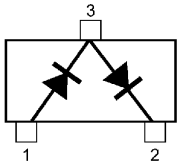
1: Cathode 1
2: Cathode 2
3: Anode

TBAT54A



1: Anode 1
2: Anode 2
3: Cathode

TBAT54C



1: Anode 1
2: Cathode 2
3: Cathode 1/Anode 2

TBAT54S

5. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Note	Rating	Unit
Peak reverse voltage	V_{RM}		35	V
Reverse voltage	V_R		30	
Average rectified current	I_O	(Note 3)	200	mA
Peak forward current	I_{FM}	(Note 3)	300	
Non-repetitive peak forward surge current	I_{FSM}	(Note 1), (Note 3)	1	A
Power dissipation	P_D	(Note 2), (Note 3)	320	mW
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		-55 to 150	

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: Measured with a 10 ms pulse.

Note 2: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm, Cu Pad: 0.42 mm^2 × 3)

Note 3: Unit rating. Total rating = unit rating × 1.5 (TBAT54A,TBAT54C), Total rating = unit rating × 0.7 (TBAT54S)

6. Electrical Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	V_F	I_F = 0.1 mA	—	0.16	—	V
		I_F = 1 mA	—	0.21	0.32	
		I_F = 10 mA	—	0.28	0.39	
		I_F = 30 mA	—	0.37	0.50	
		I_F = 100 mA	—	0.45	0.58	
Reverse current	I_R	V_R = 25 V	—	0.6	2	μA
Reverse recovery time	t_{rr}	I_F = 10 mA	—	1.5	—	ns

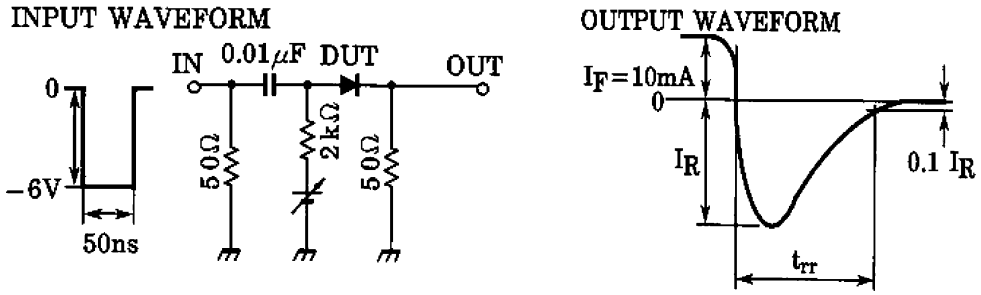


Fig. 6.1 Reverse recovery time (t_{rr}) test circuit

7. Usage Considerations

- Schottky barrier diodes (SBDs) have reverse leakage greater than other types of diodes. This makes SBDs more susceptible to thermal runaway under high-temperature and high-voltage conditions. Thus, both forward and reverse power losses of SBDs should be considered for thermal and safety design.

8. Characteristics Curves (Note)

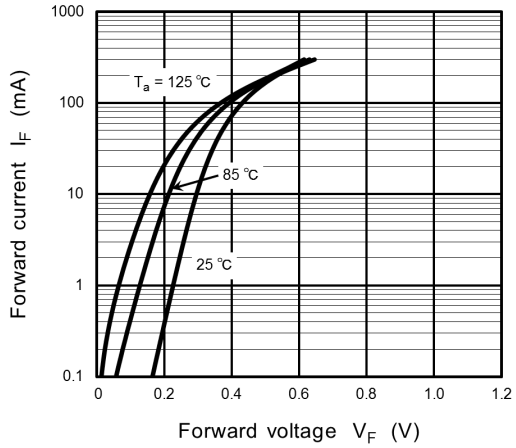


Fig. 8.1 I_F - V_F

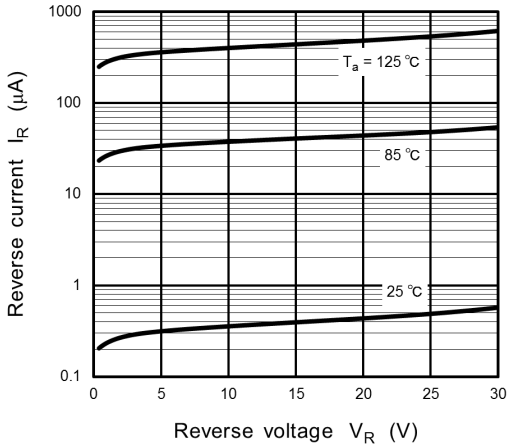


Fig. 8.2 I_R - V_R

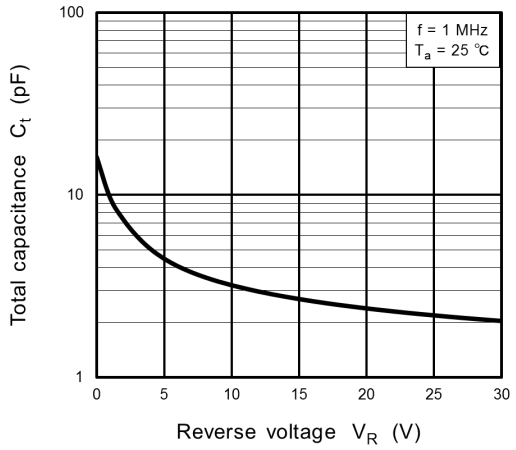
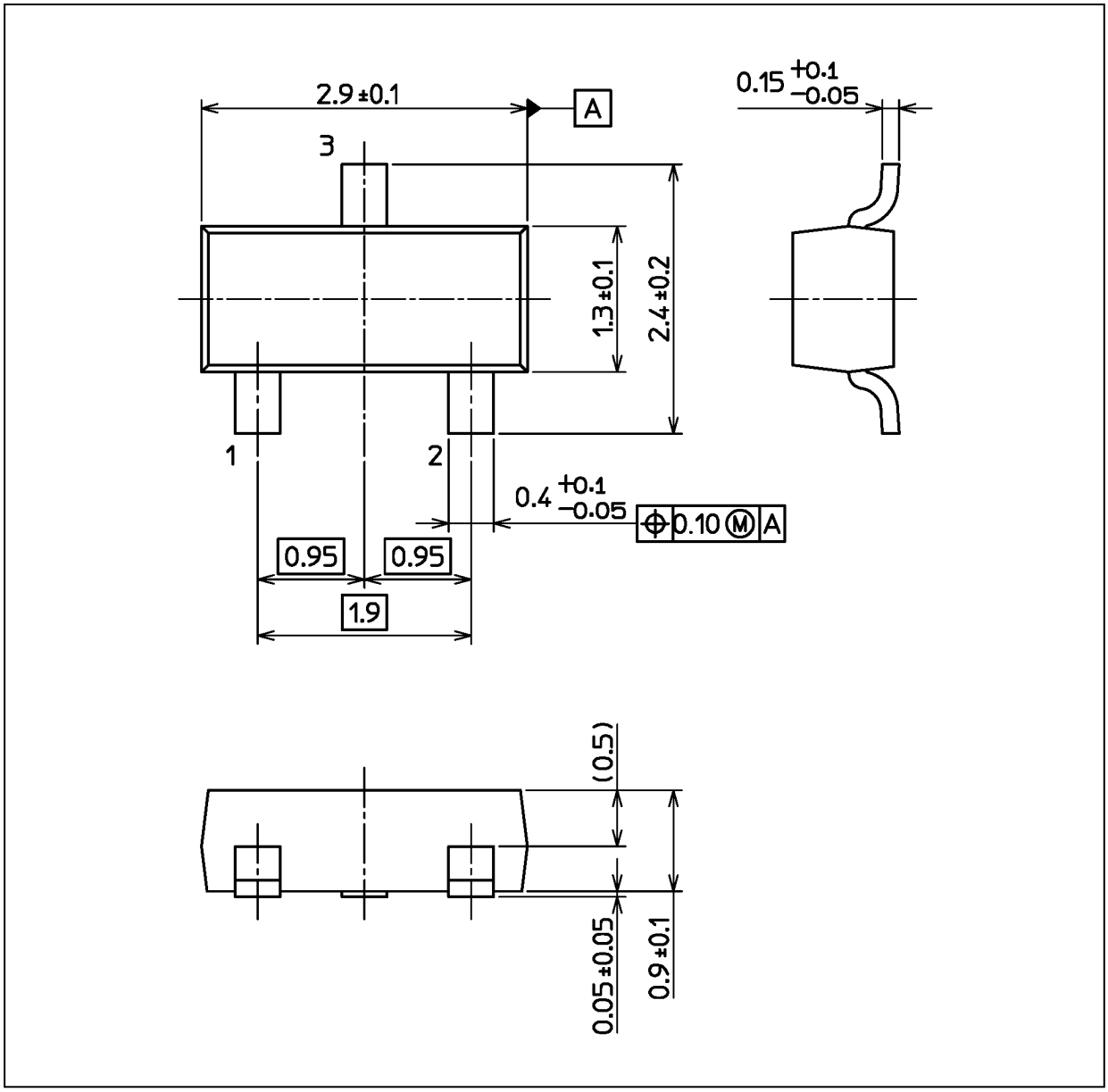


Fig. 8.3 C_t - V_R

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

Package Dimensions

Unit: mm



Weight: 0.009 g (typ.)

Package Name(s)
Nickname: SOT23

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