

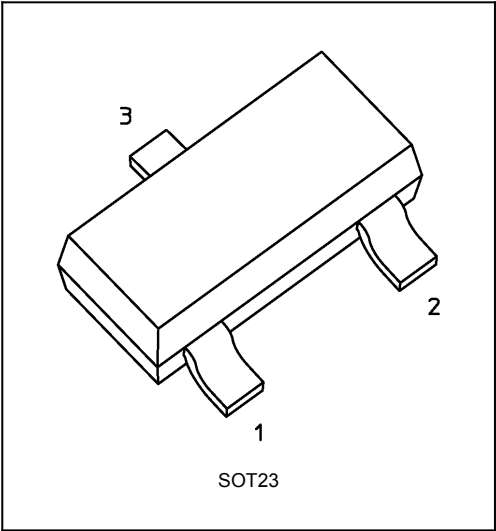
Schottky Barrier Diode Silicon Epitaxial

TBAT54/54A/54C/54S

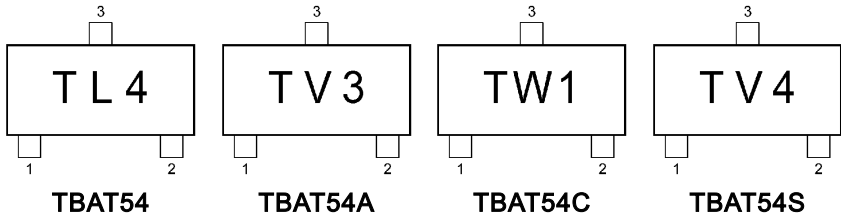
1. Applications

- Ultra-High-Speed Switching

2. Packaging



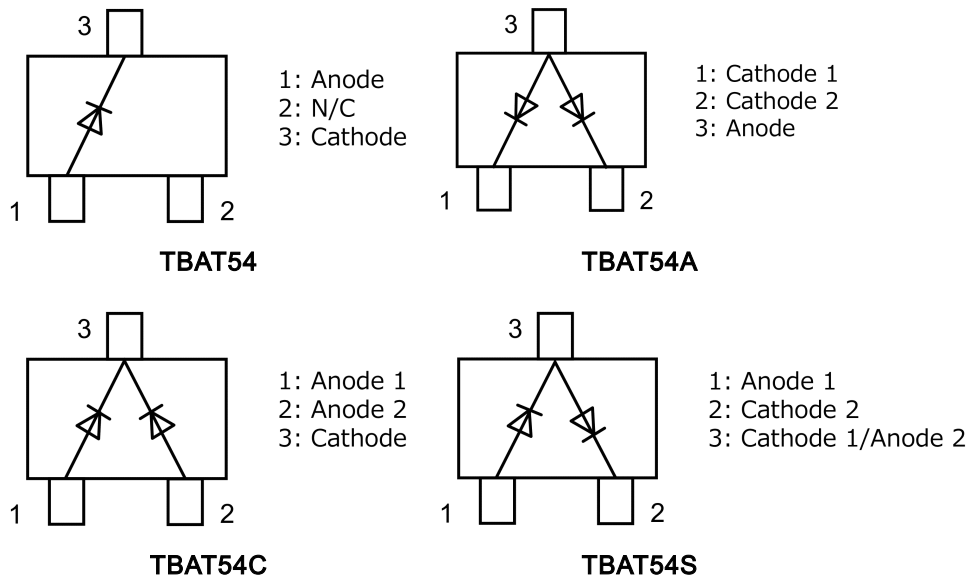
3. Marking



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



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

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	$^{\circ}\text{C}$
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: Pulse width 10 ms

Note 2: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm, Cu Pad: 0.42 mm² × 3)

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

6. Thermal resistance Characteristic

Characteristics	Symbol	Max	Unit
Junction-to-ambient thermal resistance (Note1)	$R_{th(j-a)}$	391	$^{\circ}\text{C/W}$

Note1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm, Cu pad: 0.42 mm² × 3)

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

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

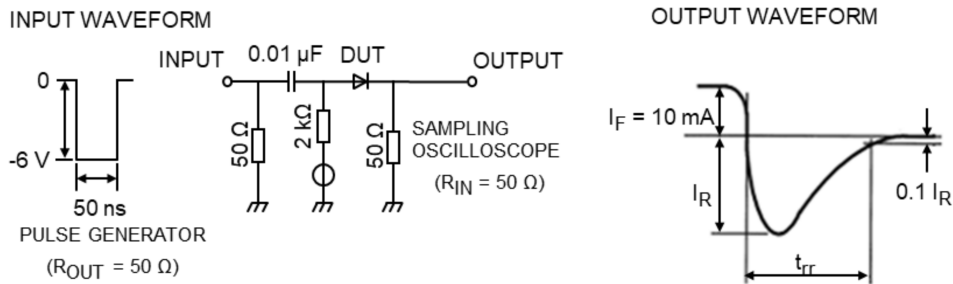


Fig. 7.1 Reverse recovery time (t_{rr}) test circuit

8. 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.

9. Characteristics Curves (Note)

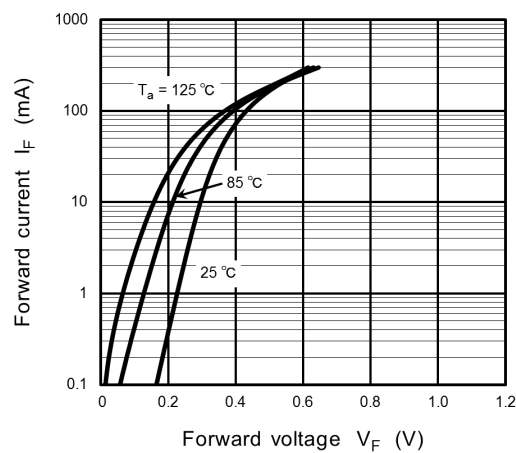


Fig. 9.1 $I_F - V_F$

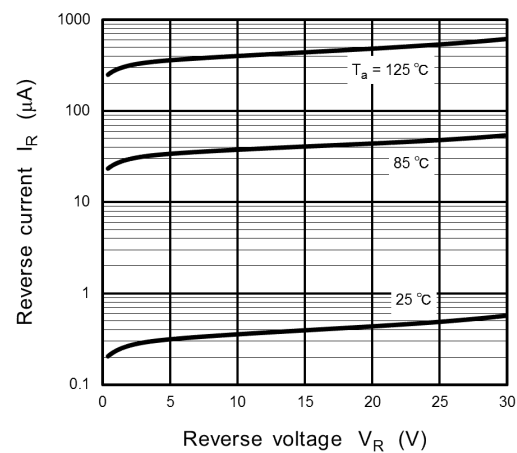


Fig. 9.2 $I_R - V_R$

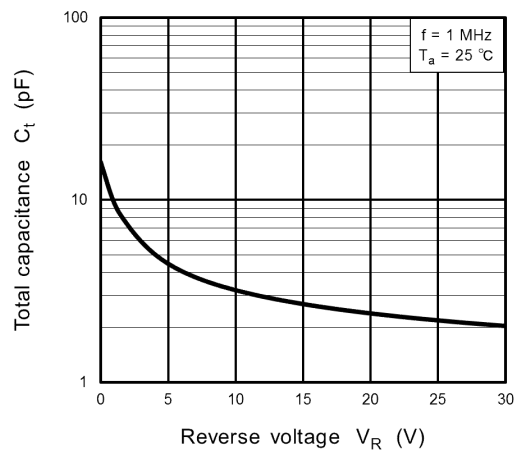
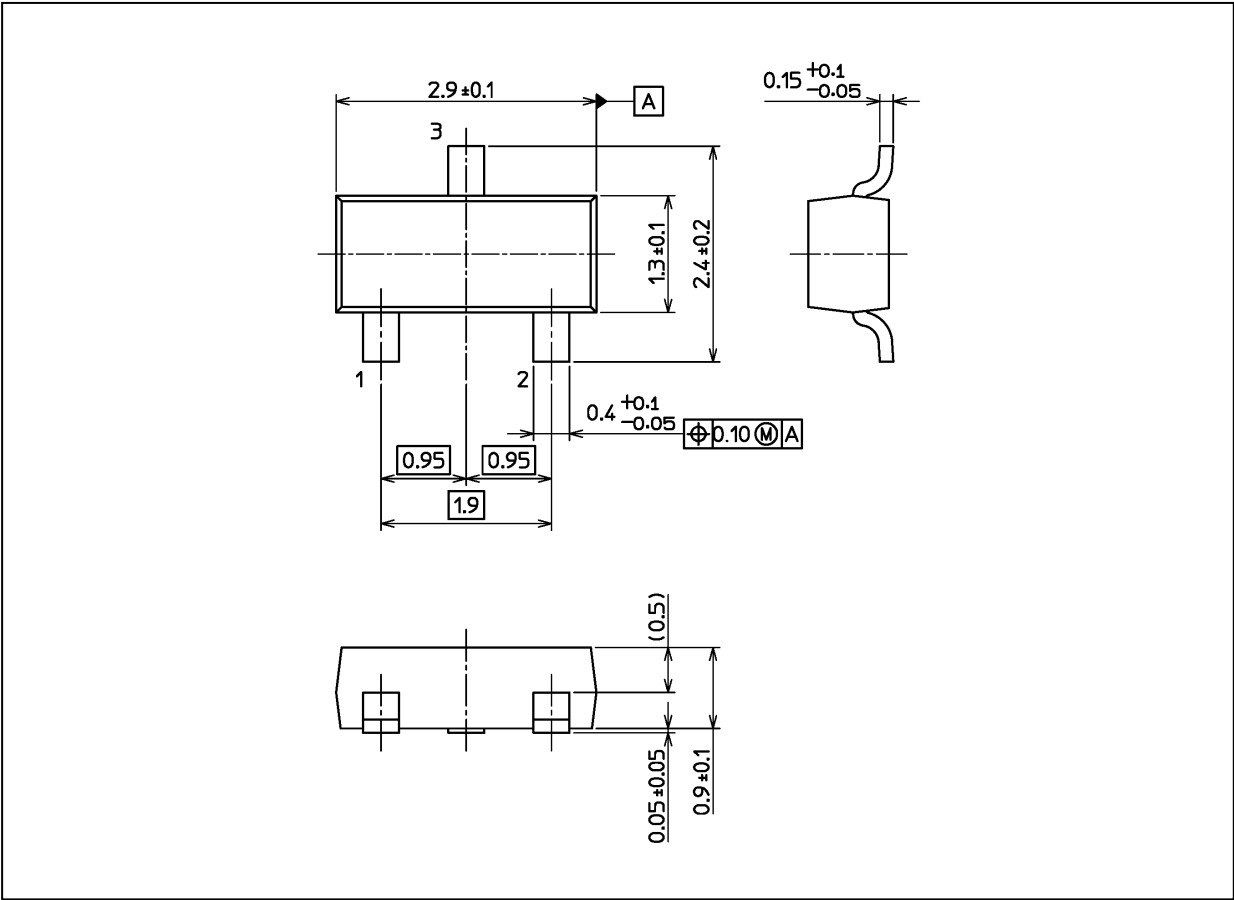


Fig. 9.3 $C_t - V_R$

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

Package Dimensions

Unit: mm



Weight: 9 mg (typ.)

Package Name(s)
JEDEC: SOT-23
Nickname: SOT23

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