

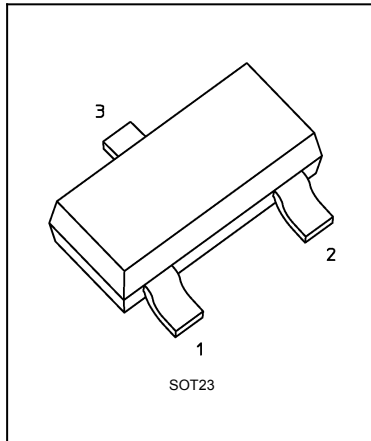
Schottky Barrier Diode Silicon Epitaxial

# TBAT54, TBAT54A, TBAT54C, TBAT54S

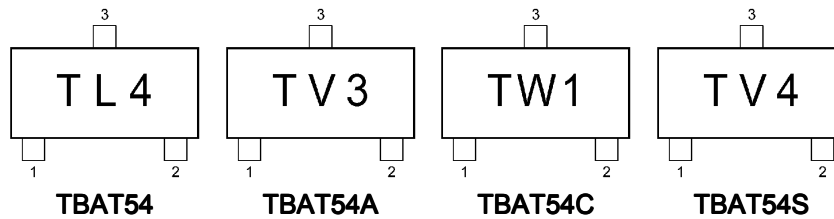
### 1. Applications

- Ultra-High-Speed Switching

### 2. Packaging



### 3. Marking

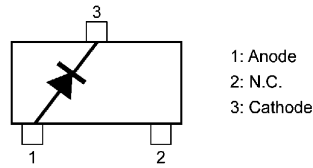


Part Number	Marking Code	Configuration
TBAT54	TL4	single
TBAT54A	TV3	common anode
TBAT54C	TW1	common cathode
TBAT54S	TV4	series

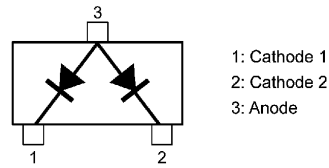
Start of commercial production

2016-04

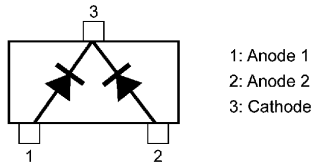
### 4. Internal Circuit



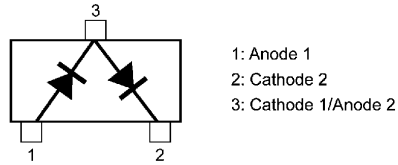
**TBAT54**



**TBAT54A**



**TBAT54C**



**TBAT54S**

### 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: 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<sup>2</sup> × 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, $T_a = 25\text{ }^\circ\text{C}$ )

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	$\mu\text{A}$
Reverse recovery time	$t_{rr}$	$I_F = 10\text{ mA}$	—	1.5	—	ns

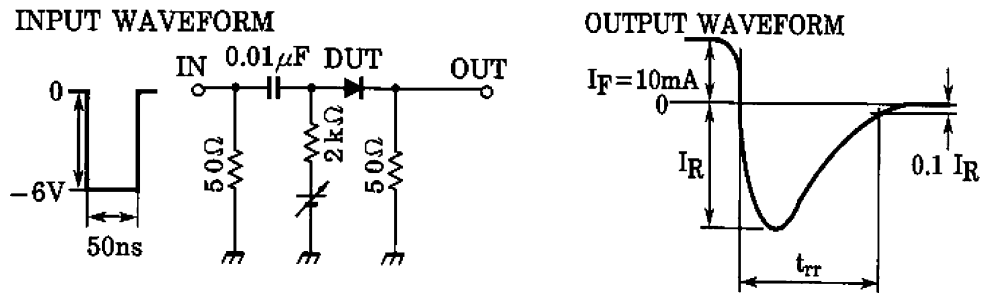
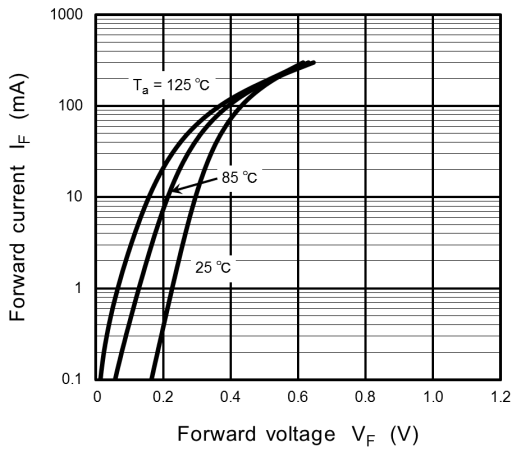


Fig. 6.1 Reverse recovery time ( $t_{rr}$ ) test circuit

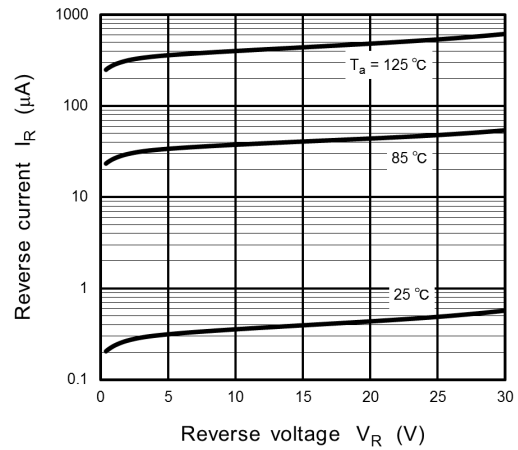
### 7. Usage Considerations

- 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.

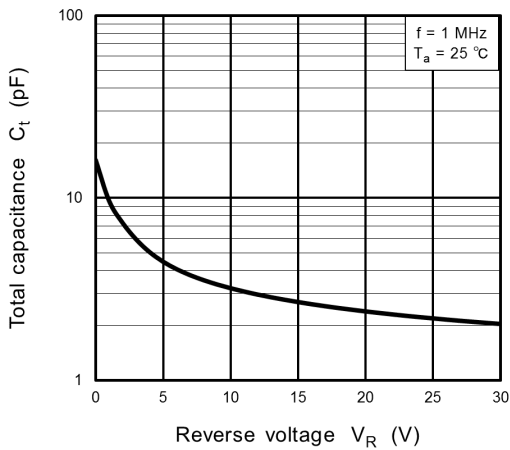
## 8. Characteristics Curves (Note)



**Fig. 8.1  $I_F - V_F$**



**Fig. 8.2  $I_R - V_R$**

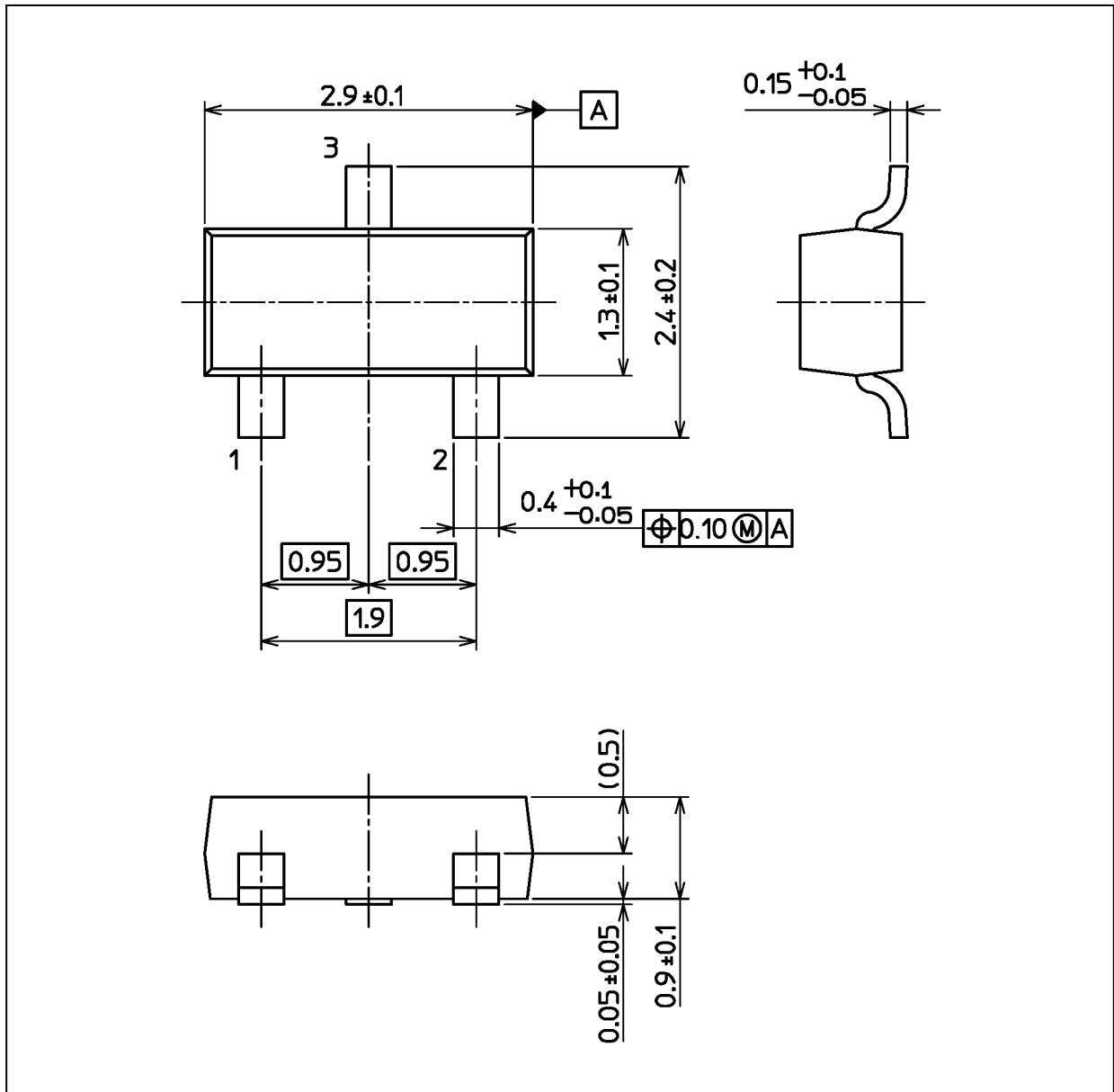


**Fig. 8.3  $C_t - V_R$**

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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