

TOSHIBA Diode Silicon Epitaxial Planar Type

# HN1D03F

## Ultra High Speed Switching Application

- Built in anode common and cathode common.

### Unit 1

- Low forward voltage Q1, Q2:  $V_F^{(3)} = 0.90V$  (typ.)
- Fast reverse recovery time Q1, Q2:  $t_{rr} = 1.6ns$  (typ.)
- Small total capacitance Q1, Q2:  $C_T = 0.9pF$  (typ.)

### Unit 2

- Low forward voltage Q3, Q4:  $V_F^{(3)} = 0.92V$  (typ.)
- Fast reverse recovery time Q3, Q4:  $t_{rr} = 1.6ns$  (typ.)
- Small total capacitance Q3, Q4:  $C_T = 2.2pF$  (typ.)

## Unit 1, Unit 2 Common Absolute Maximum Ratings ( $T_a = 25^\circ C$ )

Characteristic	Symbol	Rating	Unit
Maximum (peak) reverse voltage	$V_{RM}$	85	V
Reverse voltage	$V_R$	80	V
Maximum (peak) forward current	$I_{FM}$	300 (*)	mA
Average forward current	$I_O$	100 (*)	mA
Surge current (10ms)	$I_{FSM}$	2 (*)	A
Power dissipation	P	300	mW
Junction temperature	$T_j$	125	$^\circ C$
Storage temperature range	$T_{stg}$	-55 to 125	$^\circ C$

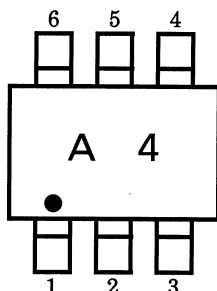
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

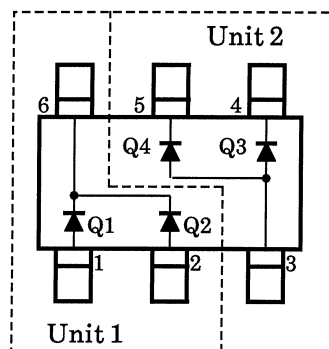
(\*) This is the Absolute Maximum Ratings of single diode (Q1 or Q2 or Q3 or Q4).

In the case of using Unit 1 and Unit 2 independently or simultaneously, the Absolute Maximum Ratings per diode is 75% of the single diode one.

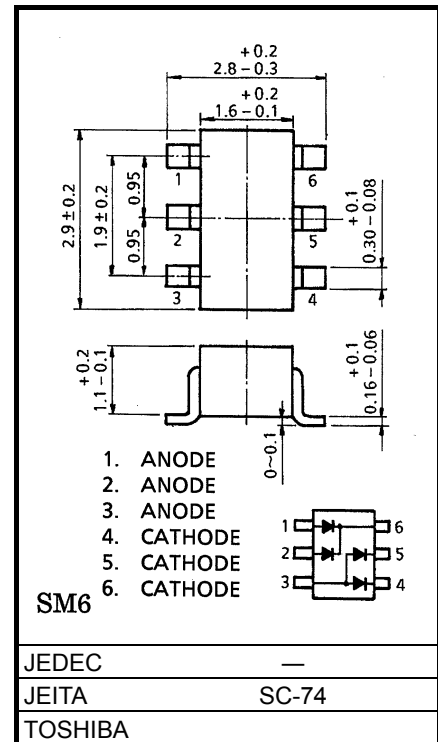
## Marking



## Pin Assignment (Top View)



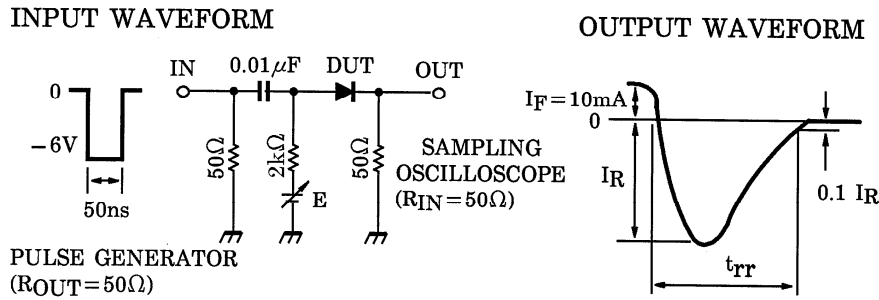
Unit: mm



Weight: 15 mg (typ.)

Start of commercial production  
1992-05

**Fig.1 Reverse Recovery Time ( $t_{rr}$ ) Test Circuit**

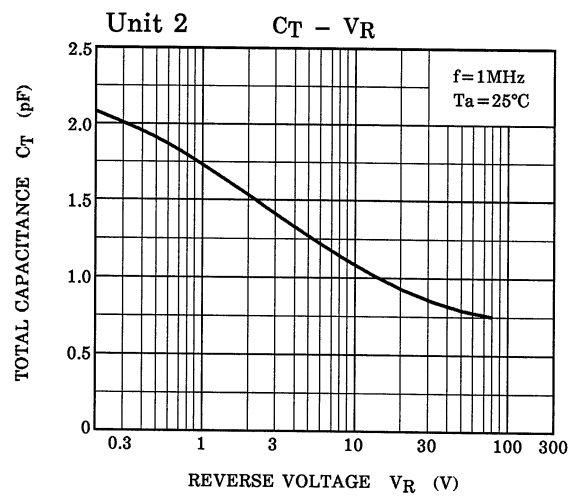
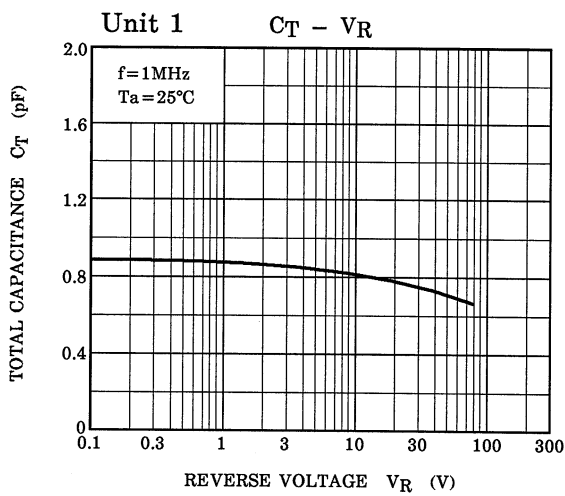
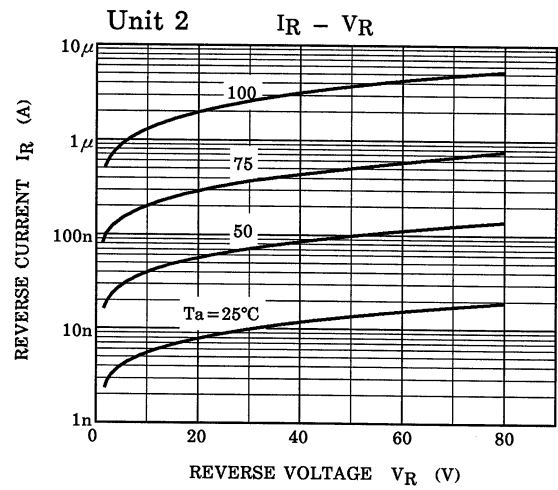
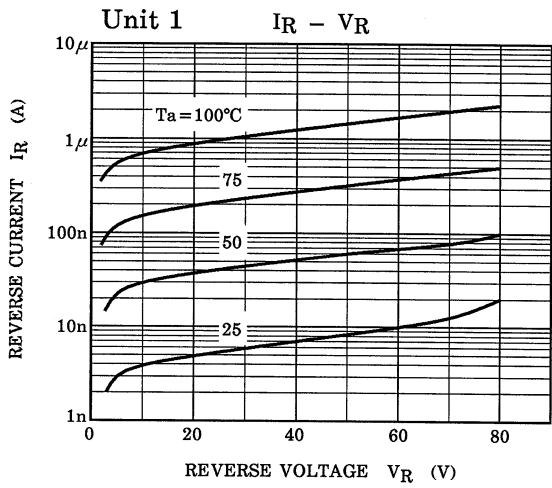
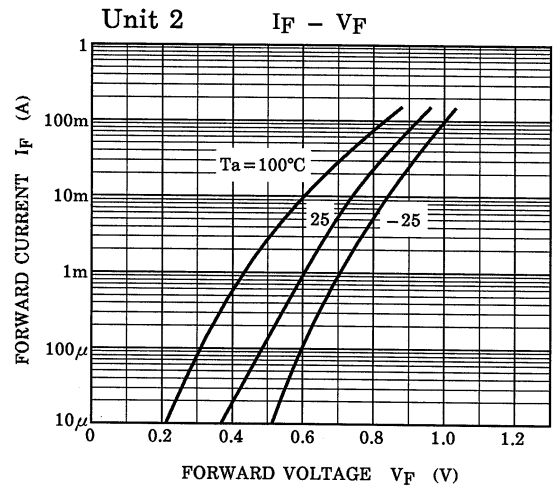
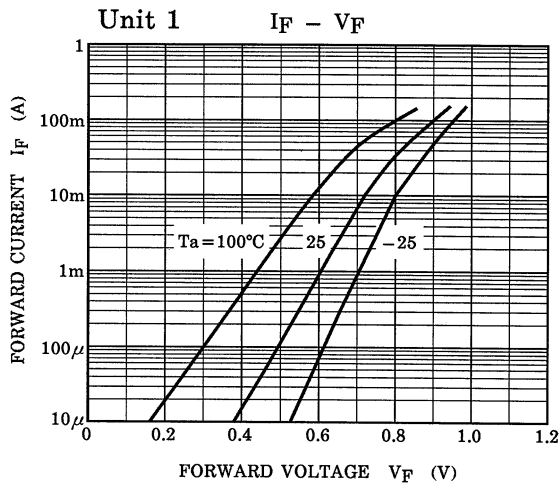


**Unit 1 Electrical Characteristics (Q1, Q2 Common) (Ta = 25°C)**

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Forward voltage	$V_F$ (1)	—	$I_F = 1\text{mA}$	—	0.60	—	V
	$V_F$ (2)	—	$I_F = 10\text{mA}$	—	0.72	—	
	$V_F$ (3)	—	$I_F = 100\text{mA}$	—	0.90	1.20	
Reverse current	$I_R$ (1)	—	$V_R = 30\text{V}$	—	—	0.1	$\mu\text{A}$
	$I_R$ (2)	—	$V_R = 80\text{V}$	—	—	0.5	
Total capacitance	$C_T$	—	$V_R = 0, f = 1\text{MHz}$	—	0.9	3.0	pF
Reverse recovery time	$t_{rr}$	—	$I_F = 10\text{mA}$ (fig.1)	—	1.6	4.0	ns

**Unit 2 Electrical Characteristics (Q3, Q4 Common) (Ta = 25°C)**

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Forward voltage	$V_F$ (1)	—	$I_F = 1\text{mA}$	—	0.61	—	V
	$V_F$ (2)	—	$I_F = 10\text{mA}$	—	0.74	—	
	$V_F$ (3)	—	$I_F = 100\text{mA}$	—	0.92	1.20	
Reverse current	$I_R$ (1)	—	$V_R = 30\text{V}$	—	—	0.1	$\mu\text{A}$
	$I_R$ (2)	—	$V_R = 80\text{V}$	—	—	0.5	
Total capacitance	$C_T$	—	$V_R = 0, f = 1\text{MHz}$	—	2.2	4.0	pF
Reverse recovery time	$t_{rr}$	—	$I_F = 10\text{mA}$ (fig.1)	—	1.6	4.0	ns





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