

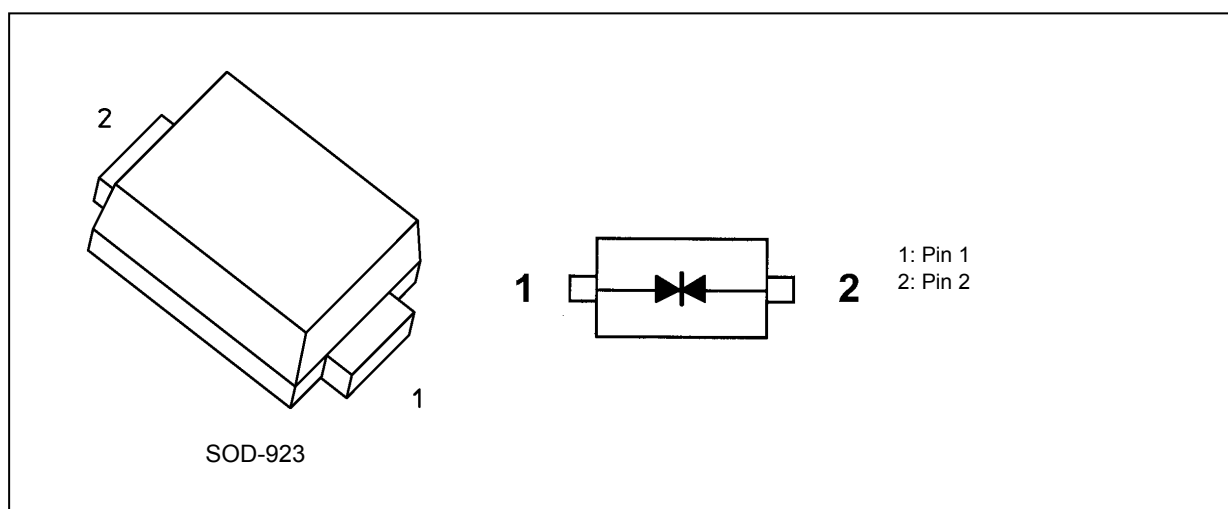
# DF2B6.8AFS

## 1. Applications

- ESD Protection

Note: This product is designed for protection against electrostatic discharge (ESD) and is not intended for any other purpose, including, but not limited to, voltage regulation.

## 2. Packaging and Internal Circuit



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

Characteristics	Symbol	Rating	Unit
Electrostatic discharge voltage (IEC61000-4-2)(Contact)	$V_{\text{ESD}}$	$\pm 30$	kV
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-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).

Start of commercial production

2013-09

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

$V_{RWM}$ : Working peak reverse voltage  
 $V_{BR}$ : Reverse breakdown voltage  
 $I_{BR}$ : Reverse breakdown current  
 $I_R$ : Reverse current  
 $V_C$ : Clamp voltage  
 $I_{PP}$ : Peak pulse current  
 $R_{DYN}$ : Dynamic resistance

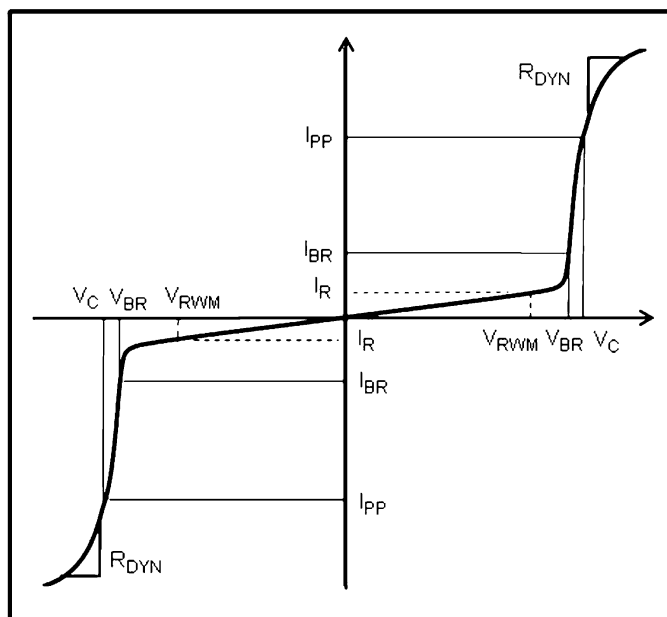


Fig. 4.1 Definitions of Electrical Characteristics

Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
Working peak reverse voltage	$V_{RWM}$		—	—	—	5.0	V
Reverse breakdown voltage	$V_{BR}$		$I_{BR} = 1 \text{ mA}$	5.8	6.8	7.8	V
Reverse current	$I_R$		$V_{RWM} = 5 \text{ V}$	—	—	0.5	$\mu\text{A}$
Clamp voltage	$V_C$	(Note 1)	$I_{PP} = 1 \text{ A}$	—	7	—	V
Dynamic resistance	$R_{DYN}$	(Note 2)	—	—	0.3	—	$\Omega$
Total capacitance	$C_t$		$V_R = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	9	13	pF

Note 1: Based on IEC61000-4-5 8/20  $\mu\text{s}$  pulse.

Note 2: TLP parameter:  $Z_0 = 50 \Omega$ ,  $t_p = 100 \text{ ns}$ ,  $t_r = 300 \text{ ps}$ , averaging window:  $t_1 = 30 \text{ ns}$  to  $t_2 = 60 \text{ ns}$ , extraction of dynamic resistance using a least-squares fit of TLP characteristics at  $I_{PP}$  between 3 A to 8 A.

#### 5. Guaranteed ESD Protection (Note)

Test Condition	ESD Protection
IEC61000-4-2 (Contact discharge)	$\pm 30 \text{ kV}$

Note: Criterion: No damage to devices.

## 6. Marking

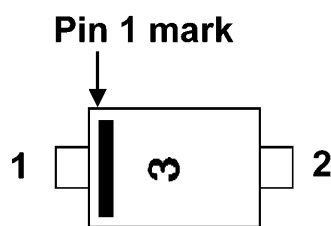


Fig. 6.1 Marking

## 7. Land Pattern Dimensions (for reference only)

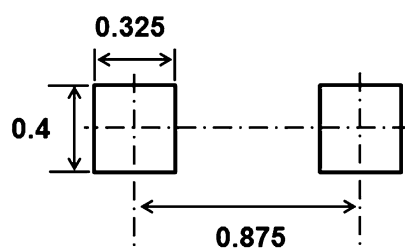


Fig. 7.1 Land Pattern Dimensions (Unit: mm)

# 8. Characteristics Curves (Note)

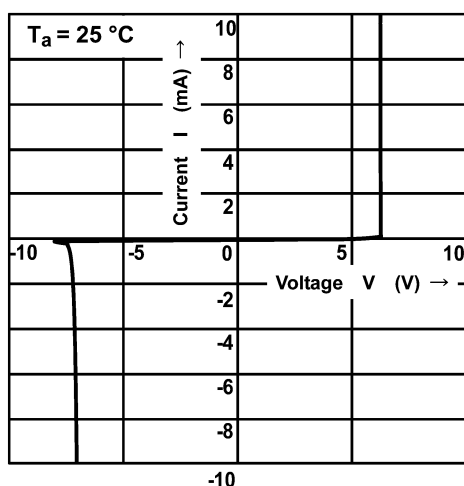


Fig. 8.1 I - V

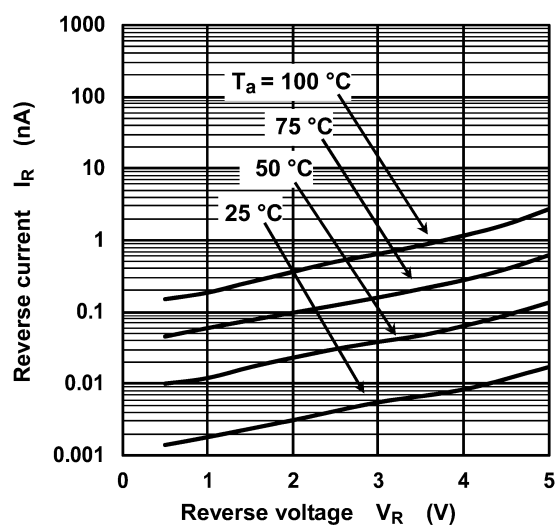


Fig. 8.2  $I_R - V_R$

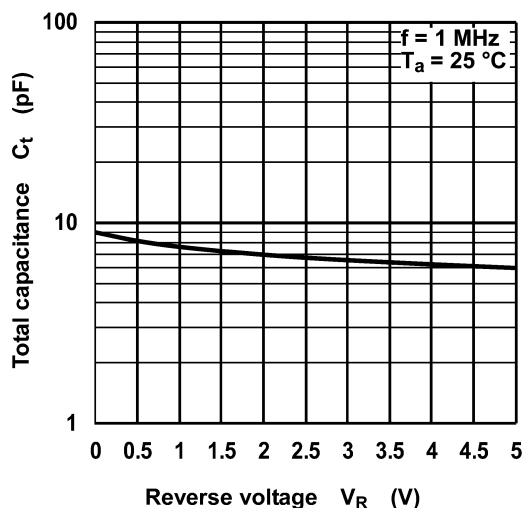


Fig. 8.3  $C_t - V_R$

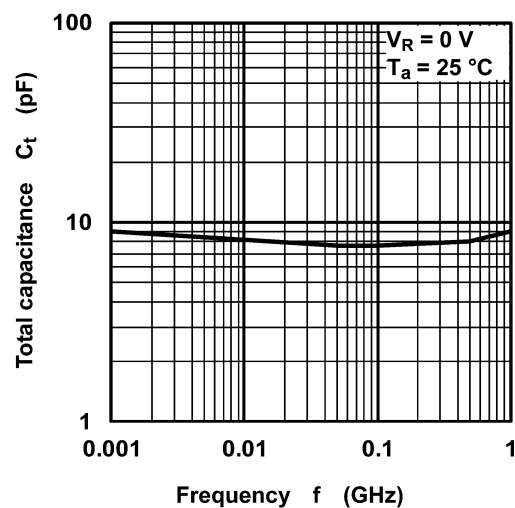


Fig. 8.4  $C_t - f$

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

## 9. Clamp Voltage $V_C$ - Peak Pulse Current ( $I_{PP}$ ) (Note)

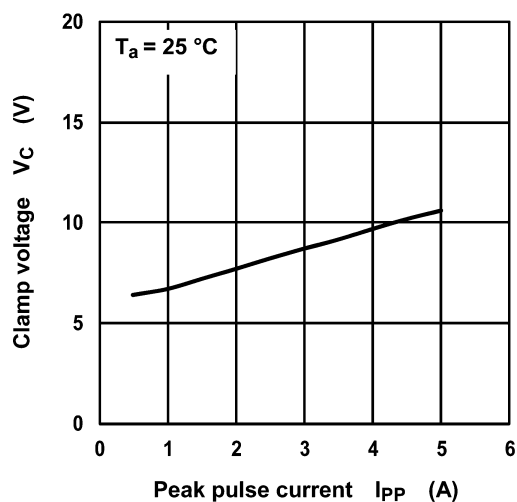


Fig. 9.1  $V_C$  -  $I_{PP}$

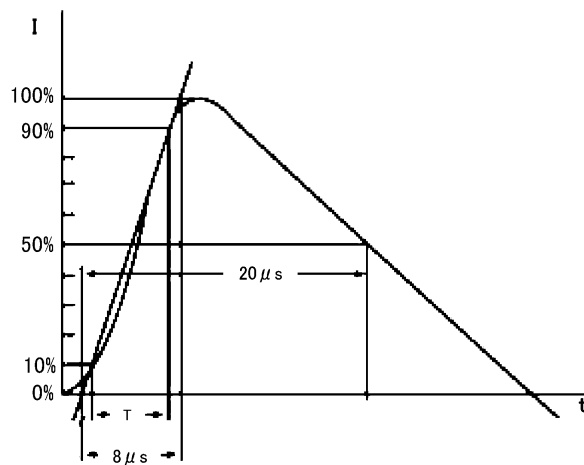


Fig. 9.2 Based on IEC61000-4-5 8/20  $\mu\text{s}$  pulse.

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

## 10. Insertion Loss ( $S_{21}$ ) (Note)

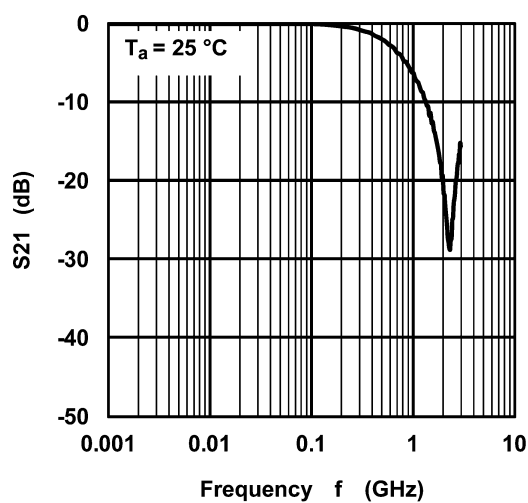
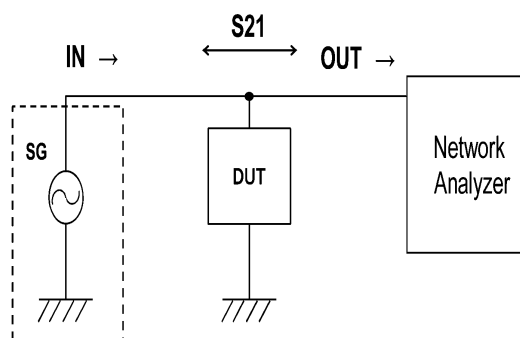


Fig. 10.1  $S_{21}$  -  $f$



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

# 11. ESD Clamp Waveform (Note)

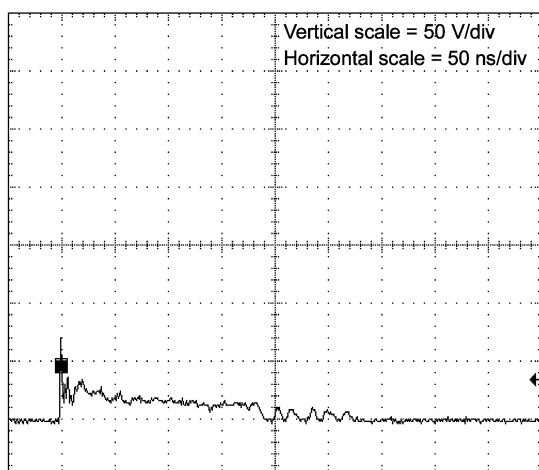


Fig. 11.1 +8 kV

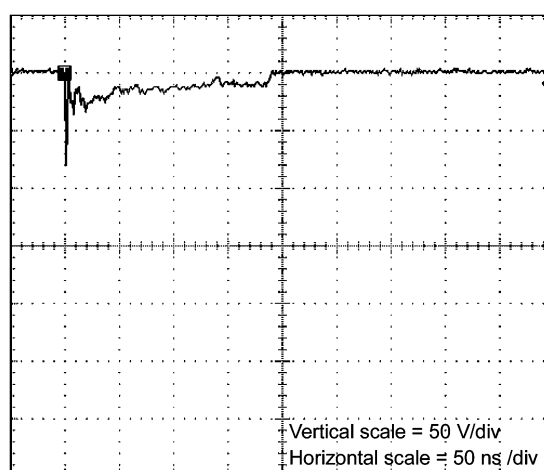


Fig. 11.2 -8 kV

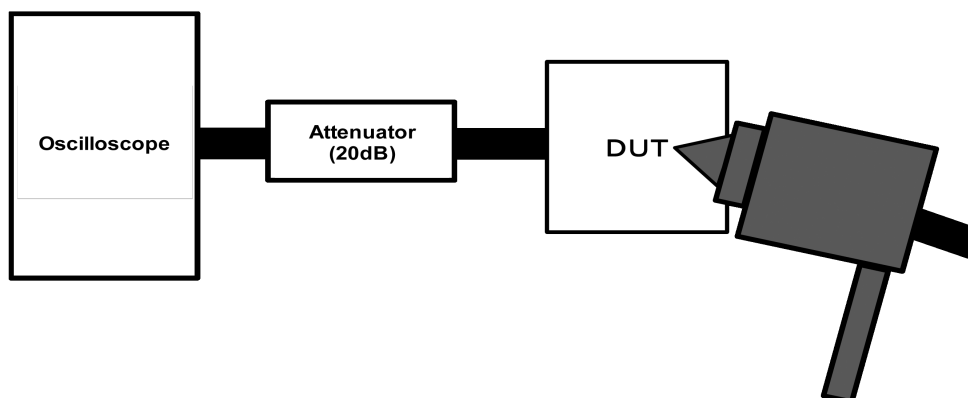
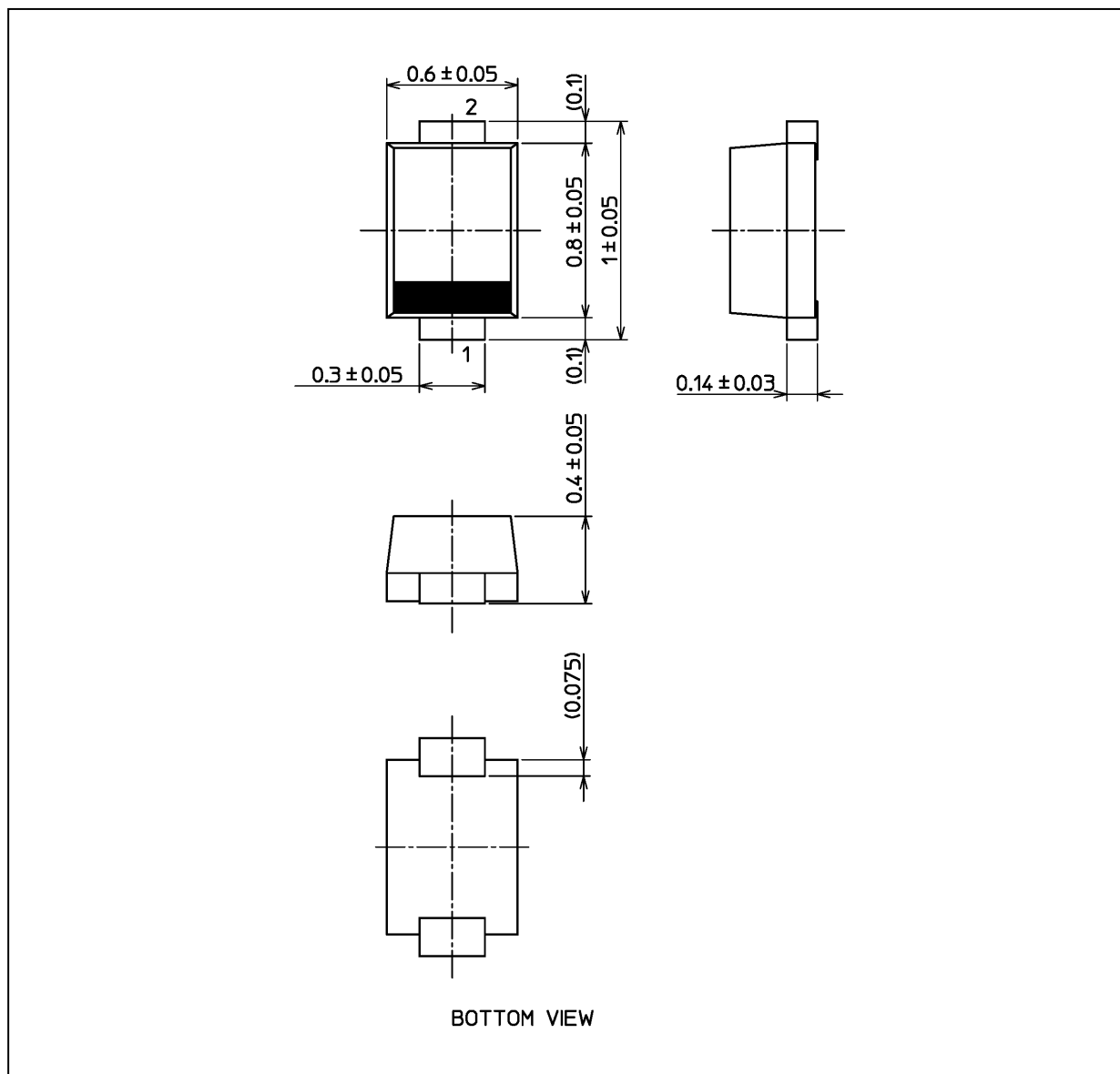


Fig. 11.3 IEC61000-4-2 (Contact)

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

## Package Dimensions

Unit: mm



Weight: 0.55 mg (typ.)

Package Name(s)
TOSHIBA: 1-1AH1A
Nickname: SOD-923

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