

DF2S20FS

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



The SOD-923 package is recommended.

| Package | Product name |
|---------|-----------------------------|
| SOD-923 | DF2S20FS,L3M (Note 1) |
| fSC | DF2S20FS,L3J , DF2S20FS,L3F |

Note 1: The product name of the devices housed in the SOD-923 package are suffixed with the "M".

Start of commercial production
2006-01

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_{ESD} | ± 12 | kV |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{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).

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

- V_{RWM} : Working peak reverse voltage
- V_Z : Zener voltage
- V_{BR} : Reverse breakdown voltage
- Z_Z : Dynamic impedance
- I_Z : Zener current
- I_{BR} : Reverse breakdown current
- I_R : Reverse current
- V_C : Clamp voltage
- I_{PP} : Peak pulse current
- R_{DYN} : Dynamic resistance
- I_F : Forward current
- V_F : Forward voltage



Fig. 4.1 Definitions of Electrical Characteristics

| Characteristics | Symbol | Note | Test Condition | Min | Typ. | Max | Unit |
|--|-----------------------|------|---|------|------|------|---------------|
| Working peak reverse voltage | V_{RWM} | | — | — | — | 15 | V |
| Zener voltage (Reverse breakdown voltage) | V_Z (V_{BR}) | | $I_Z = 5\text{ mA}$ (I_{BR}) | 18.8 | 20.0 | 21.2 | V |
| Dynamic impedance | Z_Z | | $I_Z = 5\text{ mA}$ (I_{BR}) | — | — | 50 | Ω |
| Reverse current | I_R | | $V_{RWM} = 15\text{ V}$ | — | — | 0.5 | μA |
| Total capacitance | C_t | | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$ | — | 9 | — | pF |

5. Guaranteed ESD Protection (Note)

| Test Condition | ESD Protection |
|----------------------------------|----------------|
| IEC61000-4-2 (Contact discharge) | ±12 kV |

Note: Criterion: No damage to devices.

6. Marking

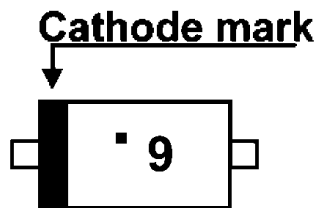


Fig. 6.1 Marking

7. Land Pattern Dimensions (for reference only)

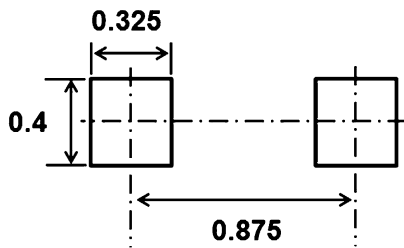


Fig. 7.1 SOD-923 (unit: mm)

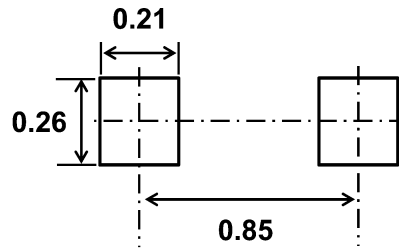


Fig. 7.2 fSC (unit: mm)

8. Characteristics Curves (Note)

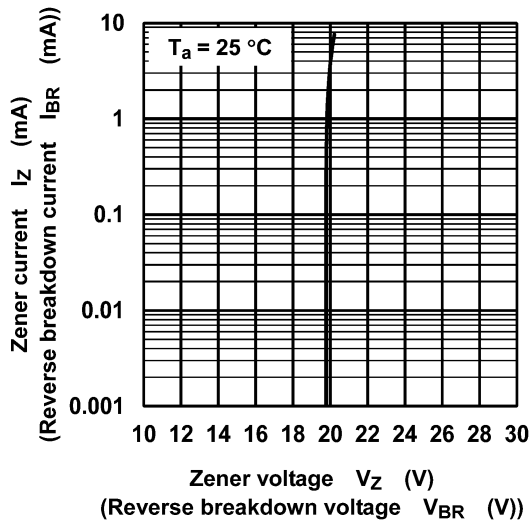


Fig. 8.1 $I_Z - V_Z$ ($I_{BR} - V_{BR}$)

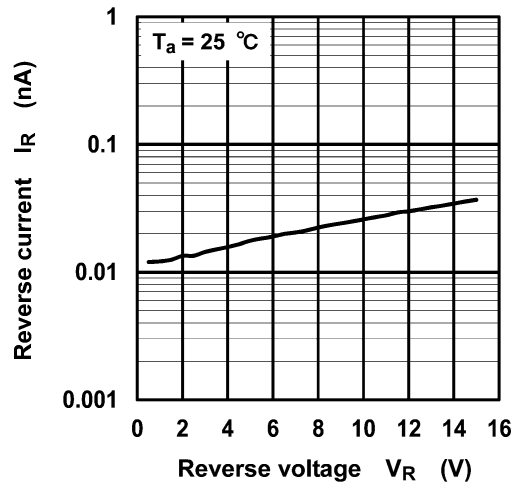


Fig. 8.2 $I_R - V_R$

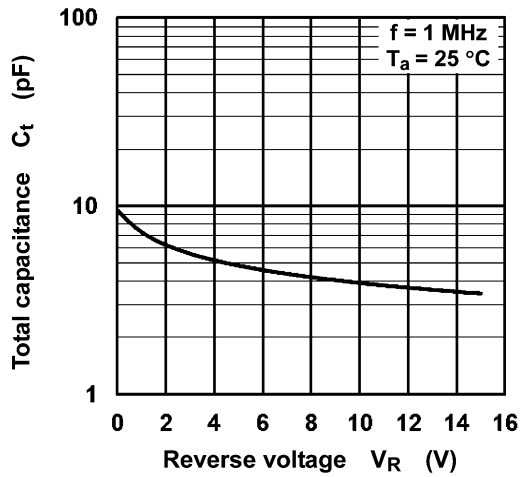


Fig. 8.3 $C_t - V_R$

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

Package Dimensions

Unit: mm



The shapes and dimensions of the package vary, depending on the manufacturing plant. For details, contact the Toshiba sales representative.

Weight: 0.55 mg (typ.)

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

Package Dimensions

Unit: mm



The shapes and dimensions of the package vary, depending on the manufacturing plant. For details, contact the Toshiba sales representative.

Weight: 0.6 mg (typ.)

| Package Name(s) |
|-----------------|
| TOSHIBA: 1-1L1S |
| Nickname: fSC |

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