

# DF2S12FU

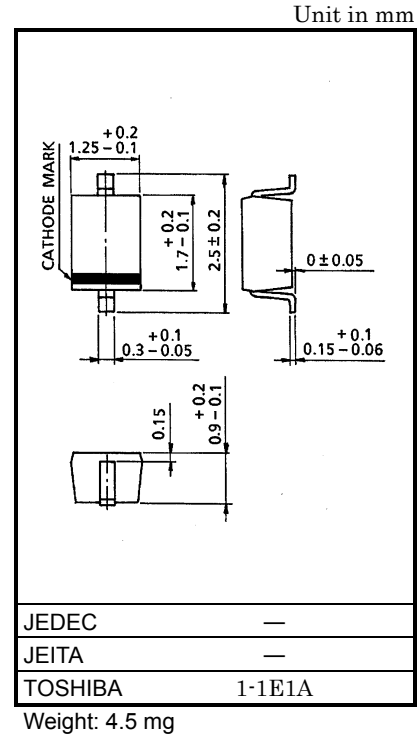
## Diodes for Protecting Against ESD

- Two-pin ultra-small packages are suitable for higher mounting densities.
- Small total capacitance:  $C_T = 15\text{pF}$  (typ.)
- Zener voltage correspond to E24 series.

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Rating	Unit
Power dissipation	P	150	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature range	$T_{\text{stg}}$	-55~125	$^\circ\text{C}$

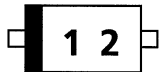
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



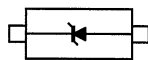
### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Zener voltage	$V_Z$	—	$I_Z = 5\text{mA}$	11.4	12.0	12.6	V
Dynamic impedance	$Z_Z$	—	$I_Z = 5\text{mA}$	—	10	—	$\Omega$
Knee dynamic impedance	$Z_{ZK}$	—	$I_Z = 0.5\text{mA}$	—	20	—	$\Omega$
Reverse current	$I_R$	—	$V_R = 9\text{V}$	—	—	0.05	$\mu\text{A}$
Total capacitance	$C_T$	—	$V_R = 0\text{V}$	—	15	—	pF

### Marking



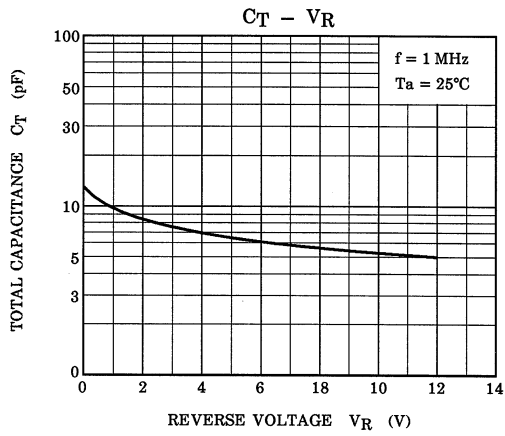
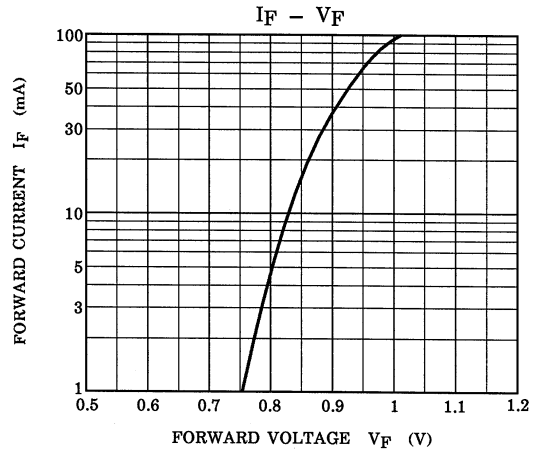
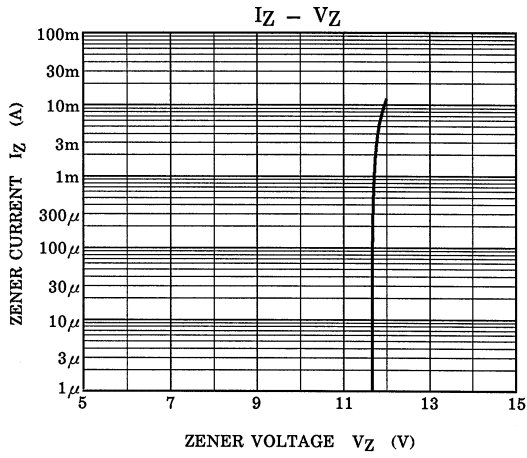
### Equivalent Circuit (Top View)



### Guaranteed Level of ESD Immunity

Test Condition	ESD Immunity Level
IEC61000-4-2 (contact discharge)	$\pm 20\text{ kV}$

Criterion: No damage to device elements



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20070701-EN GENERAL

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- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.  
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