

Zener Diode Silicon Epitaxial Planar

CUZ series 56 V to 75 V

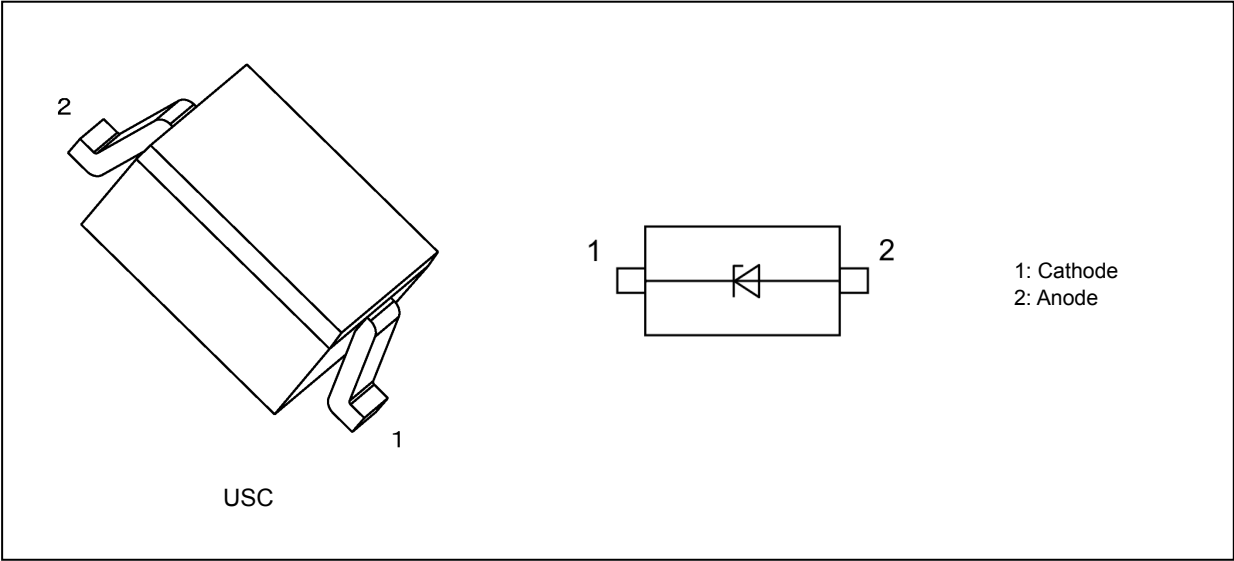
1. Applications

- (1) Voltage surge protection

2. Features

- (1) Small package
- (2) The typical voltage of VZ is accorded to E24 series.

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings 1 (Note) (Unless otherwise specified, $T_a = 25\text{ }^{\circ}\text{C}$)

Characteristics	Symbol	Note	Rating	Unit
Power dissipation	P_D	(Note 1)	200	mW
		(Note 2)	600	
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).

Note 1: Mounted on a glass epoxy circuit board of 20 mm × 20 mm, CU pad: 4 mm × 4 mm.

Note 2: Mounted on a glass epoxy circuit board of 25.4 mm × 25.4 mm × 1.6 mm, Cu pad: 645 mm²

Start of commercial production
2025-09

5. Absolute Maximum Ratings 2 (Note) (Unless otherwise specified, $T_a = 25\text{ }^{\circ}\text{C}$)

Type No.	Electrostatic discharge voltage (Contact, Air) $V_{ESD}(kV)$ (Note 1)	Peak pulse power $P_{PK}(W)$ (Note 2)	Peak pulse current $I_{PP}(A)$ (Note 2)
CUZ56V	± 13	620	5.0
CUZ62V	± 16	620	5.0
CUZ68V	± 20	620	5.0
CUZ75V	± 23	620	5.0

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: According to IEC61000-4-2.

Note 2: According to IEC61000-4-5 ($t_p = 8 / 20\text{ }\mu\text{s}$)

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

Type No.	Zener Voltage V_Z (V)				Dynamic Impedance Z_Z (Ω)		Dynamic Resistance R_{DYN} (Ω) (Note 1)	Clamp Voltage V_C (V) (Note 1) (Note 2)	Total Capacitance C_t (pF) (Note 3)	Reverse Current I_R (μA)	
	Min	Typ.	Max	Test Current I_Z (mA)	Max	Test Current I_Z (mA)	Typ.	Typ.	Typ.	Max	Test Voltage V_R (V)
CUZ56V	52	56	60	2	100	2	4.0	120	30	0.1	50
CUZ62V	58	62	66	2	100	2	3.2	114	27	0.1	55
CUZ68V	64	68	72	2	100	2	3.1	115	25	0.1	60
CUZ75V	70	75	79	2	100	2	3.4	112	24	0.1	66

Note 1: TLP parameters: $Z_0 = 50\text{ }\Omega$, $t_p = 100\text{ ns}$, $t_r = 300\text{ ps}$, averaging window: $t_1 = 30\text{ ns}$ to $t_2 = 60\text{ ns}$, extraction of dynamic resistance using least squares fit of TLP characteristics between $I_{PP1} = 8\text{ A}$ and $I_{PP2} = 16\text{ A}$.

Note 2: $I_{TLP} = 16\text{ A}$

Note 3: $V_R = 0\text{ V}$, $f = 1\text{ MHz}$

7. Marking List

Type No.	Marking
CUZ56V	ML
CUZ62V	MM
CUZ68V	MN
CUZ75V	MP

8. Marking

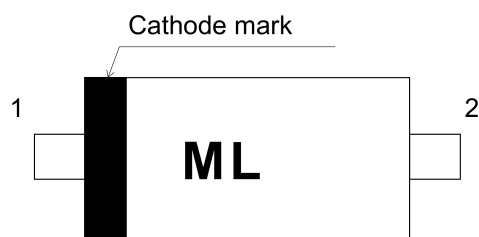


Fig. 8.1 CUZ56V

9. Land Pattern Dimensions (for reference only)

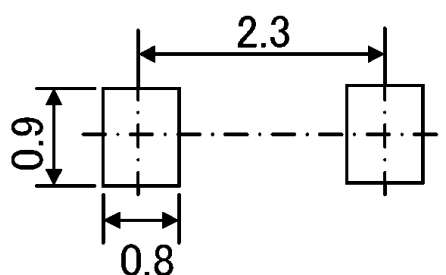


Fig. 9.1 Land Pattern Dimensions (for reference only) (Unit: mm)

10. Characteristics Curves

10.1. CUZ series Characteristics Curves(Note)

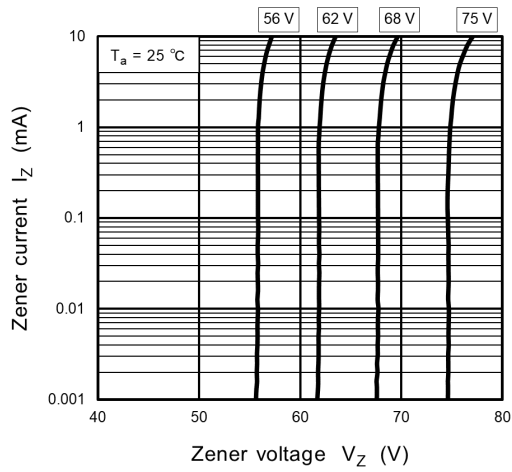


Fig. 10.1.1 $I_Z - V_Z$

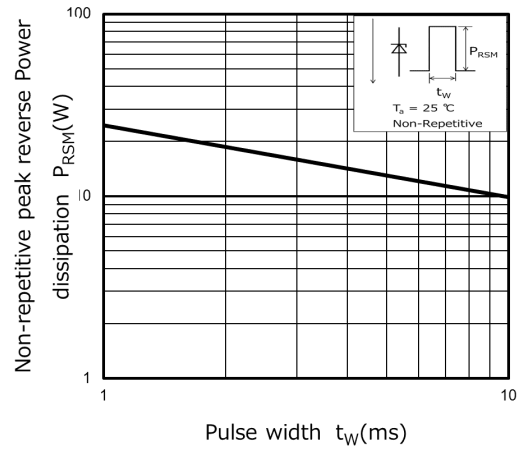


Fig. 10.1.2 $P_{RSM} - t_w$

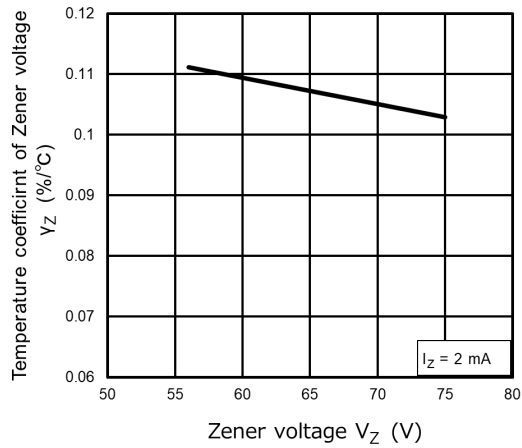


Fig. 10.1.3 $\gamma_Z - V_Z$

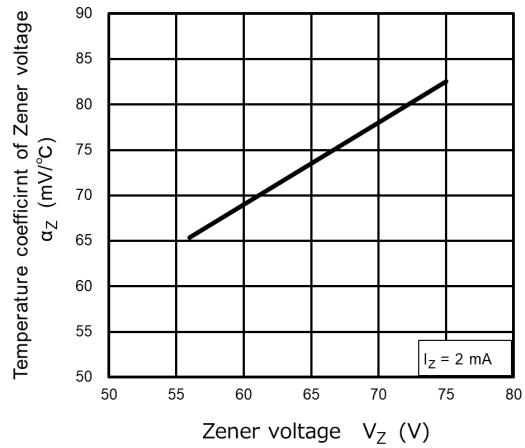


Fig. 10.1.4 $\alpha_Z - V_Z$

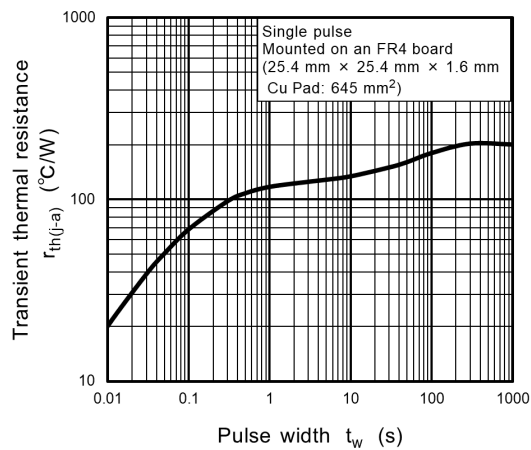


Fig. 10.1.5 $r_{th(j-a)} - t_w$

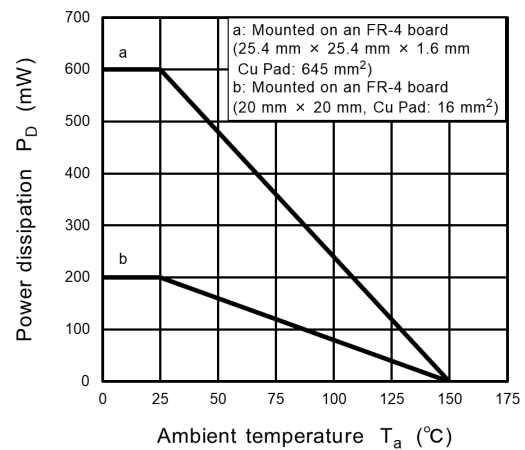


Fig. 10.1.6 $P_D - T_a$

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

10.2. CUZ56V Characteristics Curves (Note)

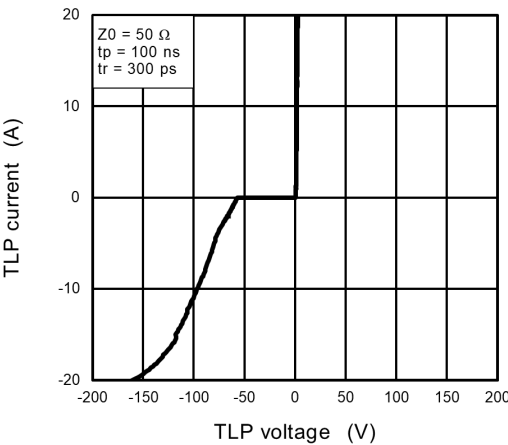


Fig. 10.2.1 $I_{TLP} - V_{TLP}$

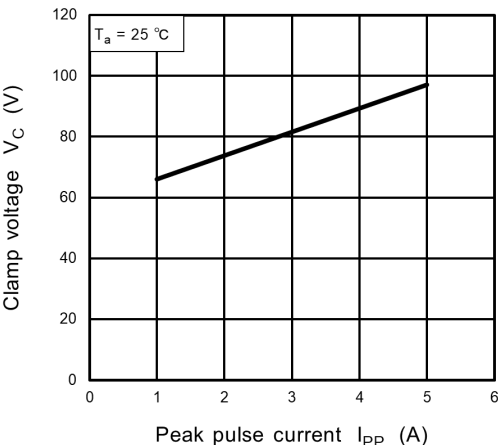


Fig. 10.2.2 $V_C - I_{PP}$

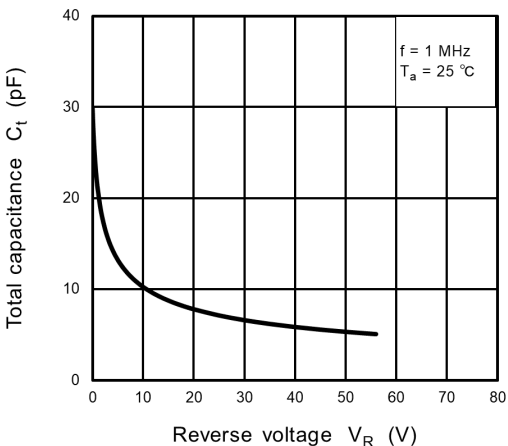


Fig. 10.2.3 $C_T - V_R$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.
Refer to Fig.10.6.1 for peak pulse current(V_C - I_{PP}).

10.3. CUZ62V Characteristics Curves (Note)

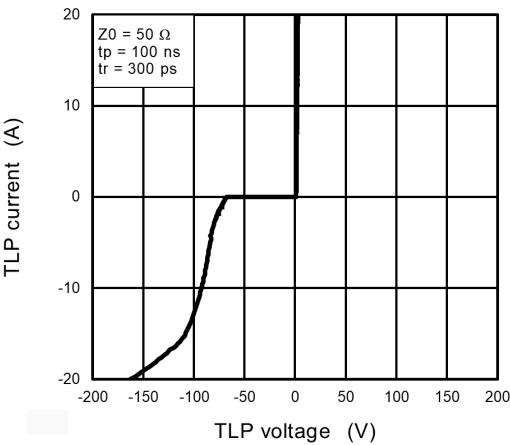


Fig. 10.3.1 $I_{TLP} - V_{TLP}$

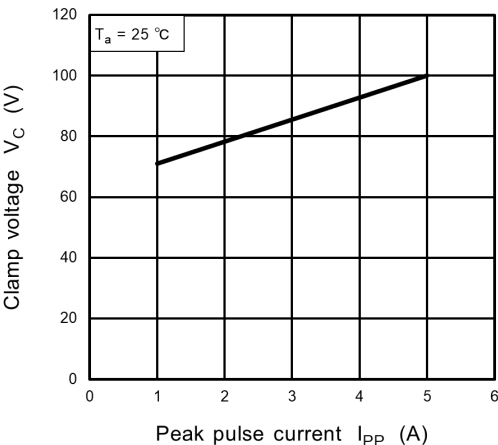


Fig. 10.3.2 $V_C - I_{PP}$

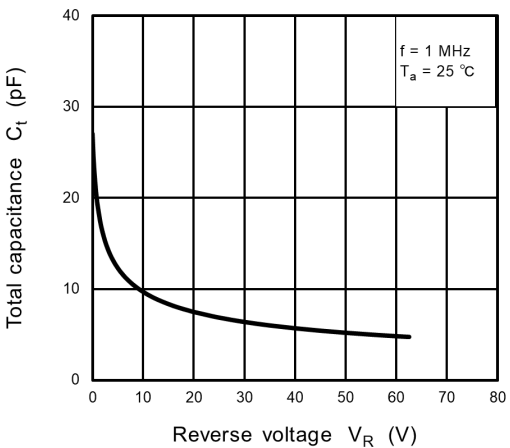


Fig. 10.3.3 $C_T - V_R$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.
Refer to Fig.10.6.1 for peak pulse current(V_C - I_{PP}).

10.4. CUZ68V Characteristics Curves (Note)

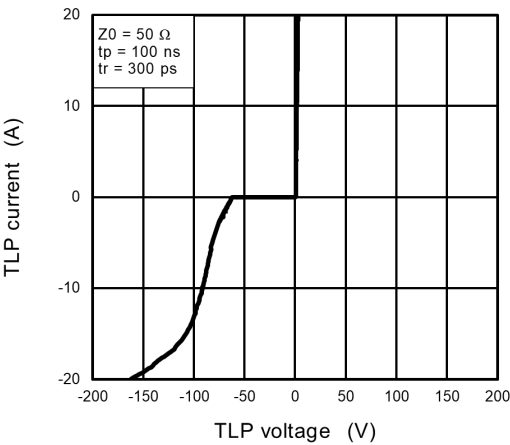


Fig. 10.4.1 $I_{TLP} - V_{TLP}$

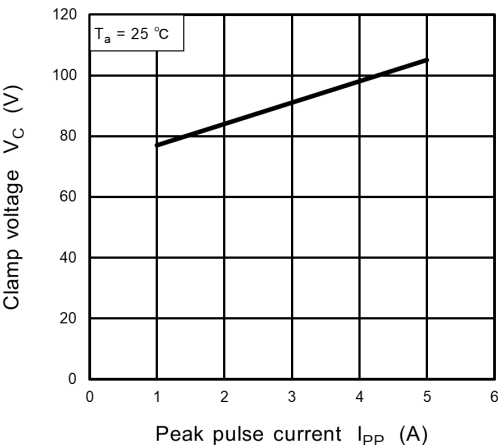


Fig. 10.4.2 $V_C - I_{PP}$

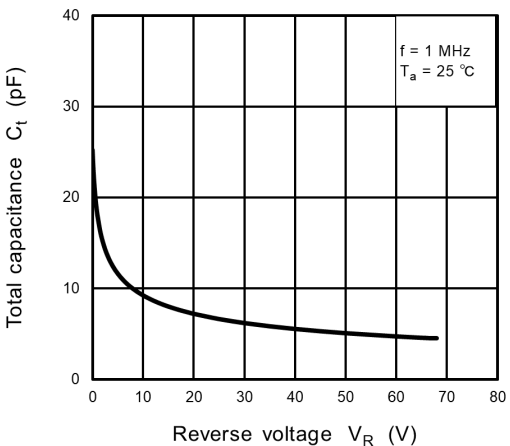


Fig. 10.4.3 $C_T - V_R$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.
Refer to Fig.10.6.1 for peak pulse current(V_C - I_{PP}).

10.5. CUZ75V Characteristics Curves (Note)

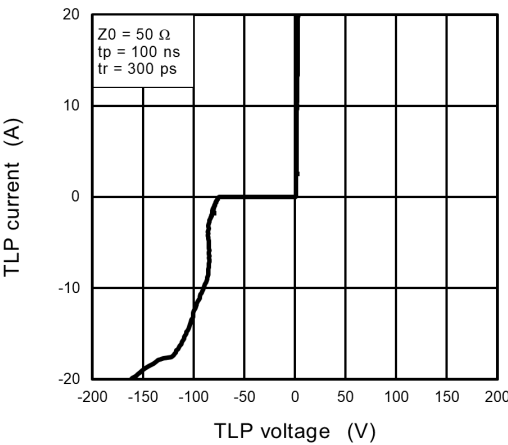


Fig. 10.5.1 $I_{TLP} - V_{TLP}$

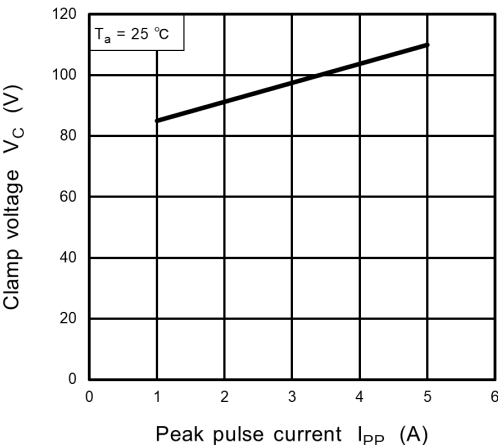


Fig. 10.5.2 $V_C - I_{PP}$

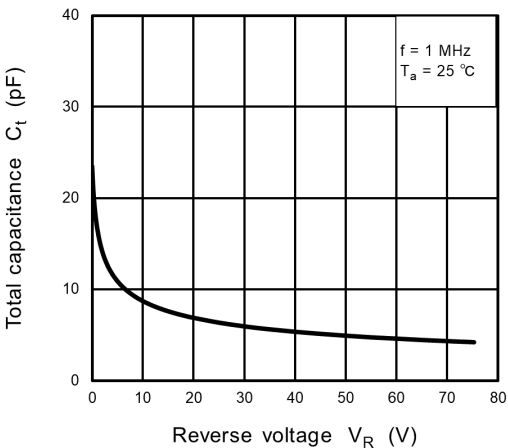


Fig. 10.5.3 $C_T - V_R$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.
Refer to Fig.10.6.1 for peak pulse current(V_C - I_{PP}).

10.6. V_C - I_{PP} Peak Pulse current

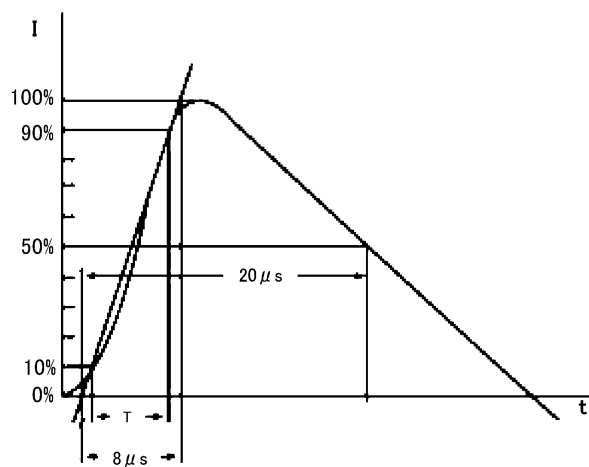
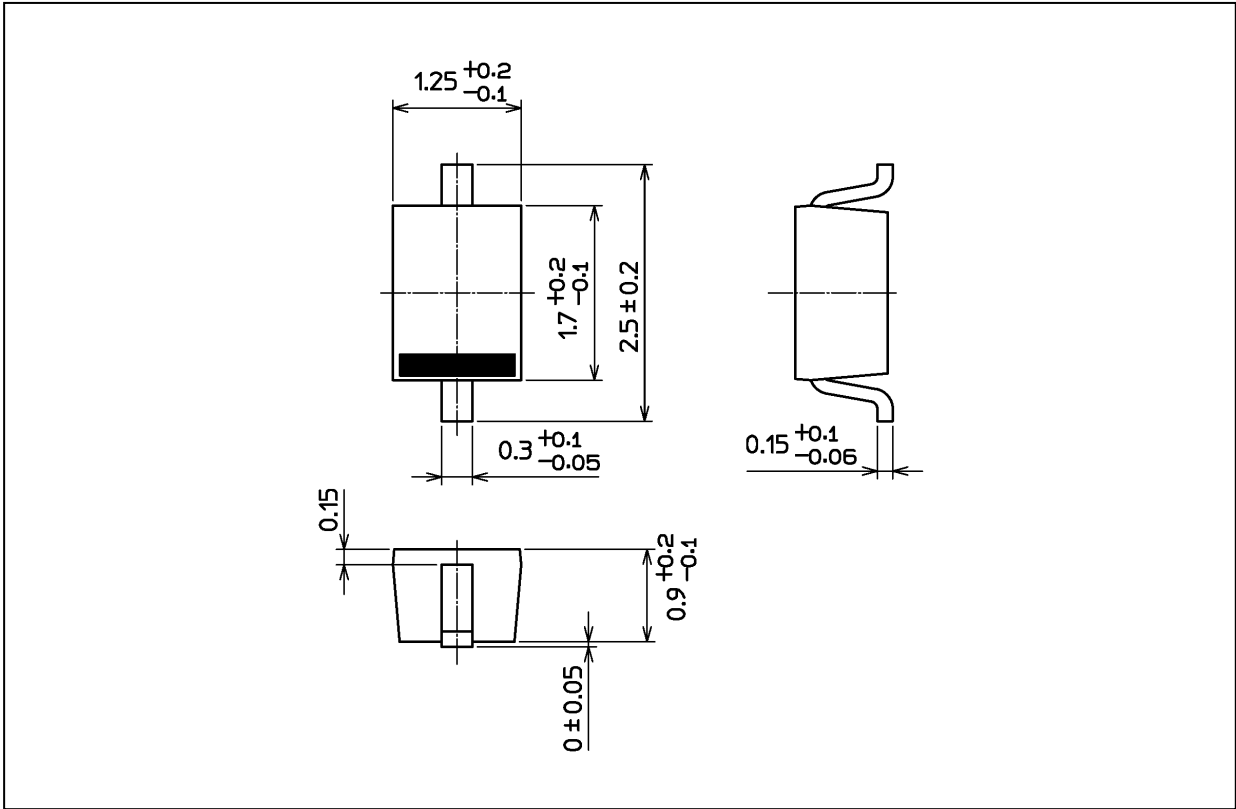


Fig. 10.6.1 V_C - I_{PP} Peak Pulse Current
(according to IEC61000-4-5 8/20 μs pulse)

Package Dimensions

Unit: mm



Weight: 4.5 mg (typ.)

Package Name(s)
JEDEC: SOD-323
Nickname: USC

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