

Zener Diode Silicon Epitaxial Planar

XCUZ series

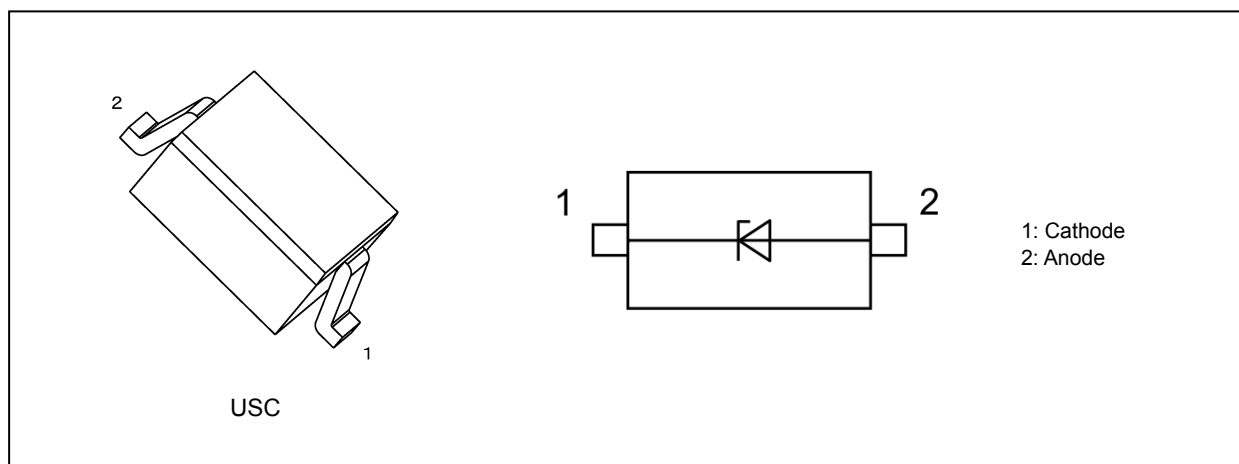
1. Applications

- (1) Automotive
- (2) Voltage surge protection

2. Features

- (1) AEC-Q101 qualified
- (2) Small package
- (3) 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 | |

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, pad dimensions of 16 mm²

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

2023-06

5. Absolute Maximum Ratings 2 (Note) (Unless otherwise specified, T_a = 25 °C)

| Type No. | Electrostatic discharge voltage IEC61000-4-2 (Contact, Air) V _{ESD} (kV) (Note 1) | Electrostatic discharge voltage ISO10605 (Cotact, Air) V _{ESD} (kV) (Note 2) | Peak pulse power P _{PK} (W) (Note 3) | Peak pulse current I _{PP} (A) (Note 3) |
|----------|--|---|---|---|
| XCUZ5V6 | ±30 | ±30 | 155 | 12.0 |
| XCUZ6V2 | ±30 | ±30 | 175 | 11.0 |
| XCUZ6V8 | ±30 | ±30 | 180 | 10.0 |
| XCUZ7V5 | ±30 | ±30 | 190 | 9.5 |
| XCUZ8V2 | ±30 | ±30 | 200 | 8.5 |
| XCUZ9V1 | ±30 | ±30 | 200 | 8.0 |
| XCUZ10V | ±30 | ±30 | 200 | 7.5 |
| XCUZ11V | ±30 | ±30 | 200 | 7.25 |
| XCUZ12V | ±30 | ±30 | 200 | 7.0 |
| XCUZ13V | ±30 | ±30 | 200 | 6.5 |
| XCUZ15V | ±30 | ±30 | 200 | 5.6 |
| XCUZ16V | ±30 | ±30 | 200 | 5.5 |
| XCUZ18V | ±30 | ±30 | 200 | 5.1 |
| XCUZ20V | ±30 | ±30 | 200 | 5.0 |
| XCUZ22V | ±30 | ±30 | 200 | 4.75 |
| XCUZ24V | ±30 | ±30 | 200 | 4.5 |
| XCUZ27V | ±20 | ±30 | 200 | 4.1 |
| XCUZ30V | ±20 | ±30 | 200 | 4.0 |
| XCUZ33V | ±17 | ±25 | 200 | 3.5 |
| XCUZ36V | ±12 | ±20 | 200 | 3.0 |

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).

Note1: according to IEC61000-4-2(C = 150 pF / R = 330 Ω)

Note2: according to ISO10605(C = 330 pF / R = 2 kΩ)

Note3: according to IEC61000-4-5(tp = 8 / 20 μs)

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) |
| XCUZ5V6 | 5.3 | 5.6 | 6.0 | 5 | 30 | 5 | 0.16 | 9.0 | 125 | 1 | 2.5 |
| XCUZ6V2 | 5.8 | 6.2 | 6.6 | 5 | 30 | 5 | 0.21 | 10.0 | 105 | 1 | 3.0 |
| XCUZ6V8 | 6.4 | 6.8 | 7.2 | 5 | 30 | 5 | 0.27 | 13.0 | 88 | 0.5 | 3.5 |
| XCUZ7V5 | 7.0 | 7.5 | 7.9 | 5 | 30 | 5 | 0.32 | 14.0 | 78 | 0.5 | 4.0 |
| XCUZ8V2 | 7.7 | 8.2 | 8.7 | 5 | 30 | 5 | 0.37 | 16.5 | 67 | 0.1 | 5.0 |
| XCUZ9V1 | 8.5 | 9.1 | 9.6 | 5 | 30 | 5 | 0.44 | 17.0 | 62 | 0.1 | 6.0 |
| XCUZ10V | 9.4 | 10.0 | 10.6 | 5 | 30 | 5 | 0.52 | 19.0 | 60 | 0.1 | 7.0 |
| XCUZ11V | 10.4 | 11.0 | 11.6 | 5 | 30 | 5 | 0.60 | 24.0 | 48 | 0.1 | 8.0 |
| XCUZ12V | 11.4 | 12.0 | 12.6 | 5 | 30 | 5 | 0.70 | 26.0 | 44 | 0.1 | 9.0 |
| XCUZ13V | 12.4 | 13.0 | 14.1 | 5 | 30 | 5 | 0.80 | 27.0 | 42 | 0.1 | 10.0 |
| XCUZ15V | 13.8 | 15.0 | 15.6 | 5 | 30 | 5 | 0.60 | 24.0 | 36 | 0.1 | 11.0 |
| XCUZ16V | 15.3 | 16.0 | 17.1 | 5 | 35 | 5 | 0.50 | 27.0 | 35 | 0.1 | 12.0 |
| XCUZ18V | 16.8 | 18.0 | 19.1 | 5 | 45 | 5 | 0.40 | 28.5 | 31 | 0.1 | 13.0 |
| XCUZ20V | 18.8 | 20.0 | 21.2 | 5 | 70 | 5 | 0.35 | 30.5 | 29 | 0.1 | 15.0 |
| XCUZ22V | 20.8 | 22.0 | 23.3 | 5 | 70 | 5 | 0.40 | 32.0 | 27 | 0.1 | 17.0 |
| XCUZ24V | 22.8 | 24.0 | 25.6 | 5 | 70 | 5 | 0.60 | 36.5 | 26 | 0.1 | 19.0 |
| XCUZ27V | 25.1 | 27.0 | 28.9 | 2 | 70 | 2 | 0.90 | 45.0 | 23 | 0.1 | 21.0 |
| XCUZ30V | 28.0 | 30.0 | 32.0 | 2 | 100 | 2 | 1.25 | 47.5 | 21 | 0.1 | 23.0 |
| XCUZ33V | 31.0 | 33.0 | 35.0 | 2 | 100 | 2 | 1.80 | 57.0 | 19 | 0.1 | 25.0 |
| XCUZ36V | 34.0 | 36.0 | 38.0 | 2 | 100 | 2 | 2.60 | 63.0 | 18 | 0.1 | 27.0 |

Note1: TLP parameters: $Z_0 = 50\ \Omega$, $t_p = 100\ \text{ns}$, $t_r = 300\ \text{ps}$, averaging window: $t_1 = 30\ \text{ns}$ to $t_2 = 60\ \text{ns}$, extraction of dynamic resistance using least squares fit of TLP characteristics between $I_{TLP1} = 16\ \text{A}$ and $I_{TLP2} = 30\ \text{A}$.

Note2: $I_{TLP} = 16\ \text{A}$

Note3: $V_R = 0\ \text{V}$, $f = 1\ \text{MHz}$

7. Marking List

| Type No. | Marking | Type No. | Marking | Type No. | Marking |
|----------|---------|----------|---------|----------|---------|
| XCUZ5V6 | NL | XCUZ11V | P3 | XCUZ22V | PA |
| XCUZ6V2 | NM | XCUZ12V | P4 | XCUZ24V | PB |
| XCUZ6V8 | NN | XCUZ13V | P5 | XCUZ27V | PC |
| XCUZ7V5 | NP | XCUZ15V | P6 | XCUZ30V | PD |
| XCUZ8V2 | NQ | XCUZ16V | P7 | XCUZ33V | PE |
| XCUZ9V1 | NR | XCUZ18V | P8 | XCUZ36V | PF |
| XCUZ10V | P2 | XCUZ20V | P9 | — | — |

8. Marking

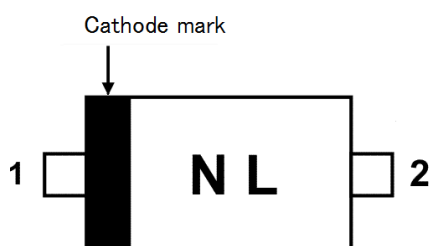


Fig. 8.1 XCUZ5V6

9. Land Pattern Dimensions (for reference only)

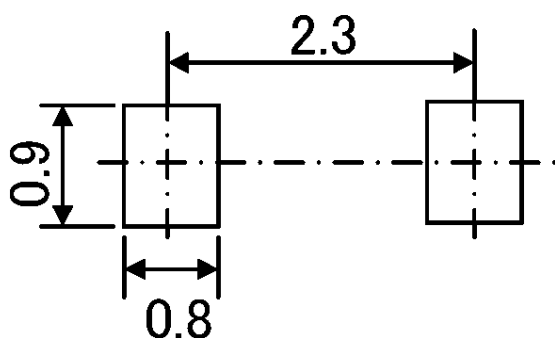


Fig. 9.1 Land Pattern Dimensions
(for reference only) (Unit: mm)

10. Characteristics Curves

10.1. XCUZ series Characteristics Curves(Note)

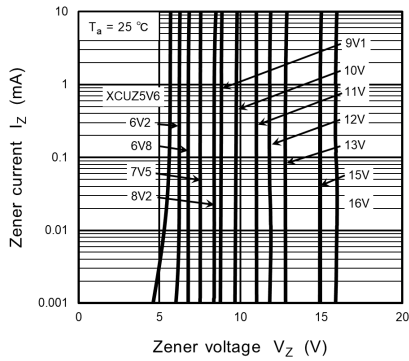


Fig. 10.1.1 $I_Z - V_Z(1)$

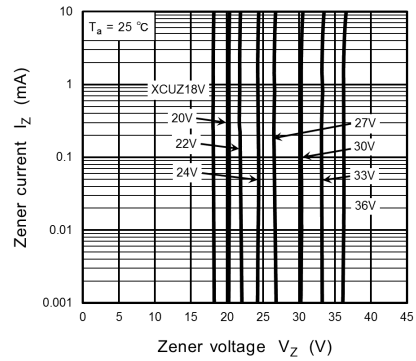


Fig. 10.1.2 $I_Z - V_Z(2)$

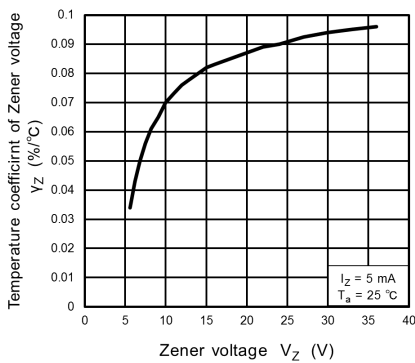


Fig. 10.1.3 $\gamma_Z - V_Z$

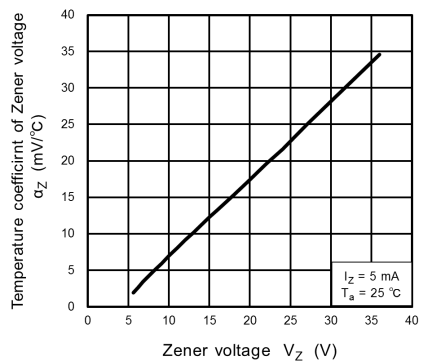


Fig. 10.1.4 $\alpha_Z - V_Z$

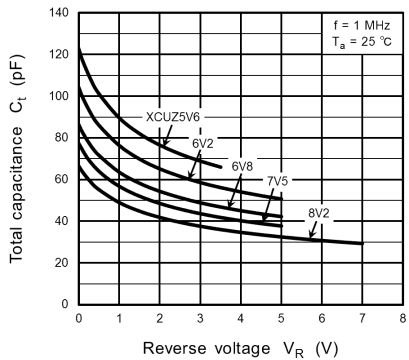


Fig. 10.1.5 $C_t - V_R (1)$

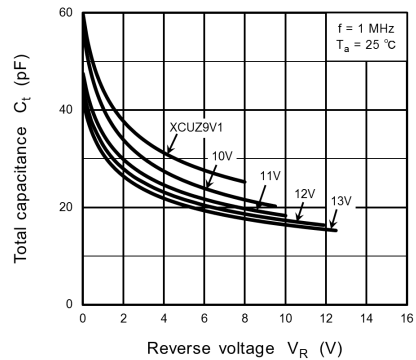


Fig. 10.1.6 $C_t - V_R (2)$

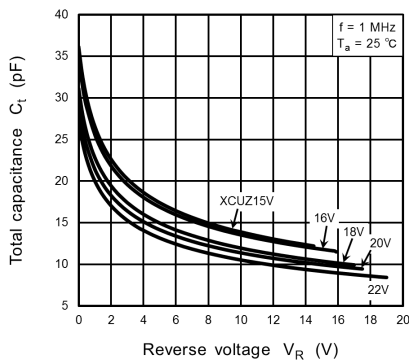


Fig. 10.1.7 $C_t - V_R (3)$

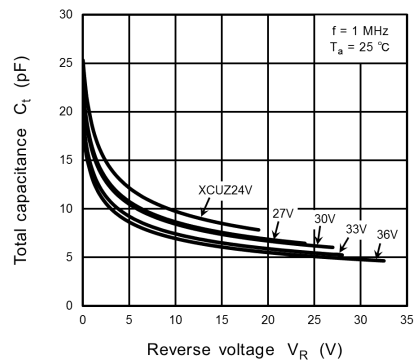


Fig. 10.1.8 $C_t - V_R (4)$

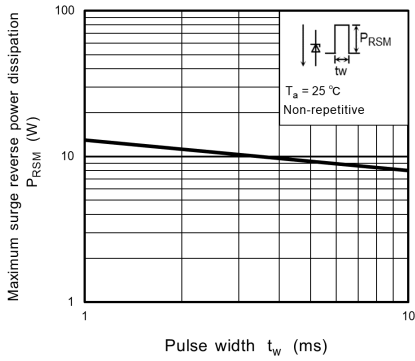


Fig. 10.1.9 $P_{RSM} - t_w$

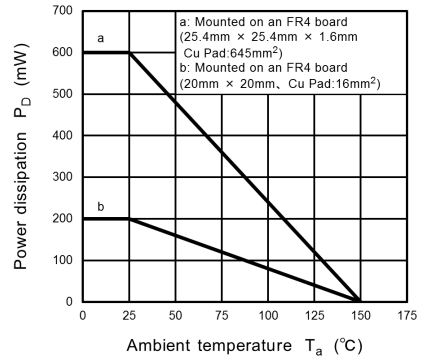


Fig. 10.1.10 $P_D - T_a$

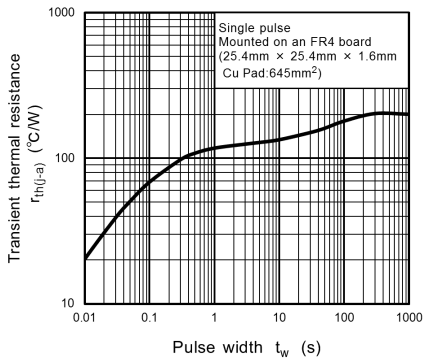


Fig. 10.1.11 $r_{th(j-a)} - t_w$

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

10.2. XCUZ5V6 Characteristics Curves(Note)

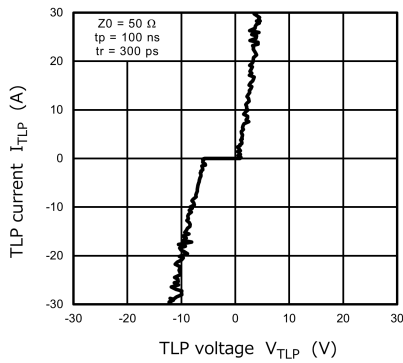


Fig. 10.2.1 $I_{TLP} - V_{TLP}$

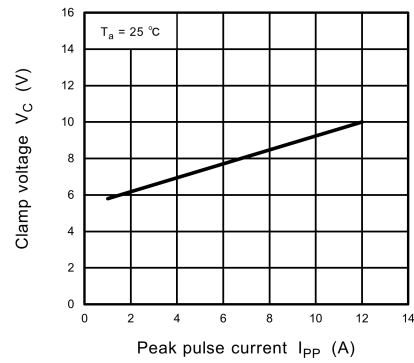


Fig. 10.2.2 $V_C - I_{PP}$

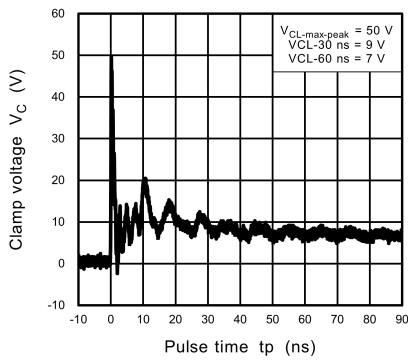


Fig. 10.2.3 IEC61000-4-2 Clamp Waveform +8 kV

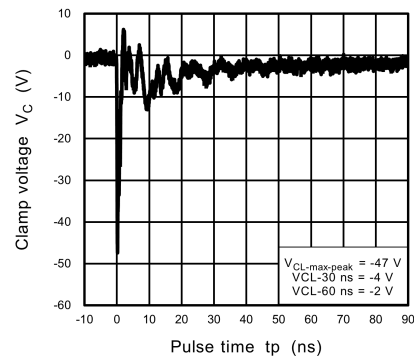


Fig. 10.2.4 IEC61000-4-2 Clamp Waveform -8 kV

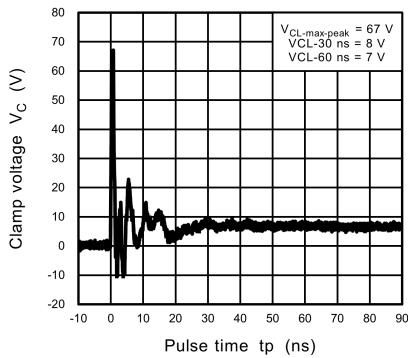


Fig. 10.2.5 ISO10605 Clamp Waveform +8 kV

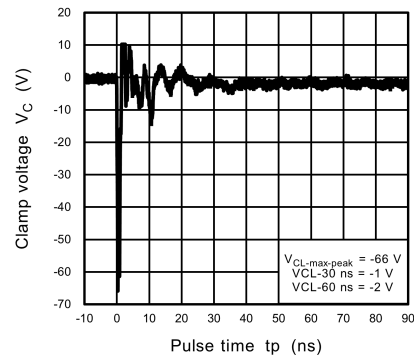


Fig. 10.2.6 ISO10605 Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.3. XCUZ6V2 Characteristics Curves(Note)

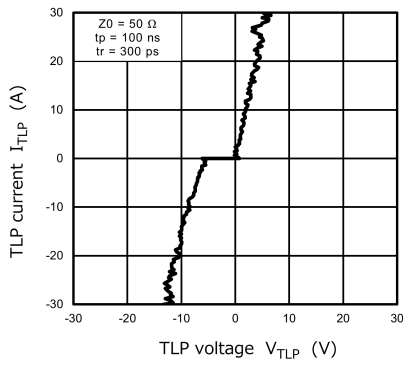


Fig. 10.3.1 $I_{TLP} - V_{TLP}$

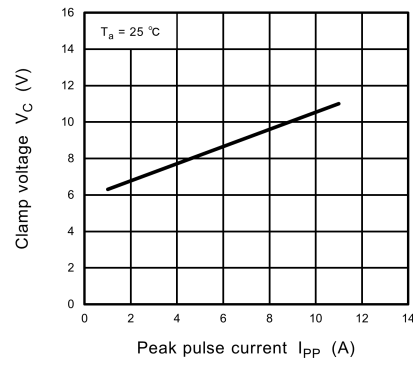
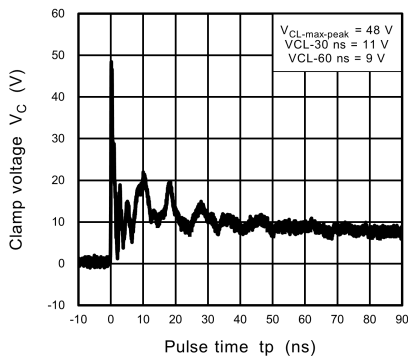
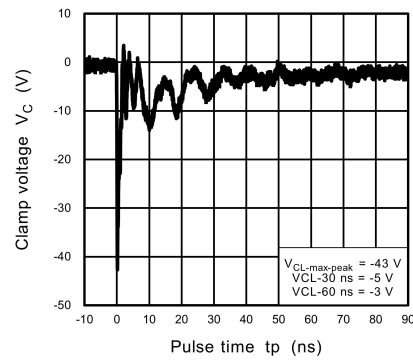


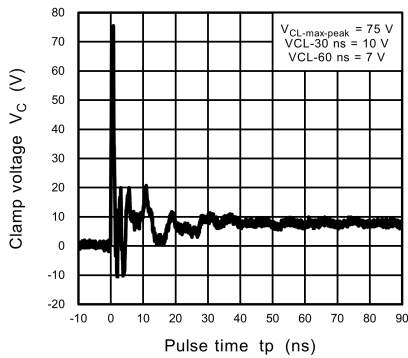
Fig. 10.3.2 $V_C - I_{PP}$



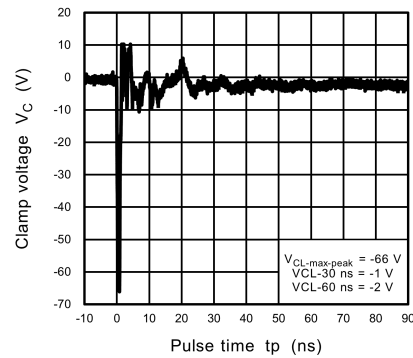
**Fig. 10.3.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.3.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.3.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.3.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current($V_C - I_{PP}$) and clamp waveform measurement circuit.

10.4. XCUZ6V8 Characteristics Curves(Note)

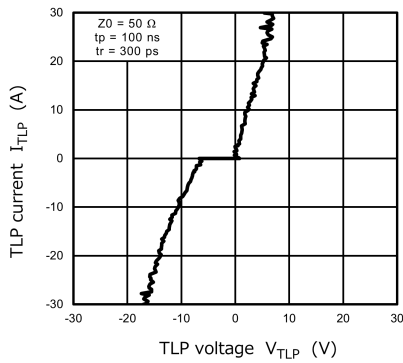


Fig. 10.4.1 $I_{TLP} - V_{TLP}$

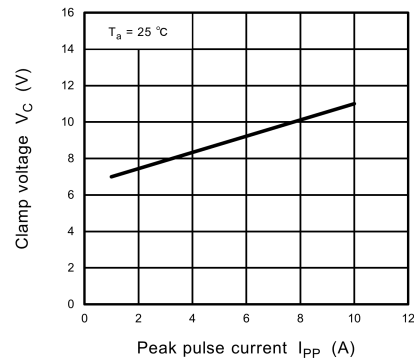
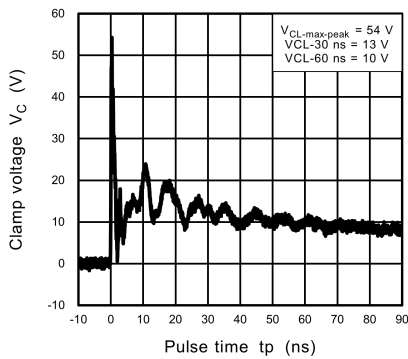
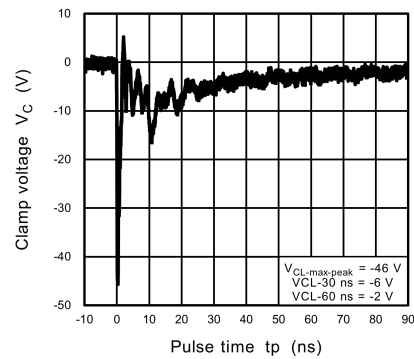


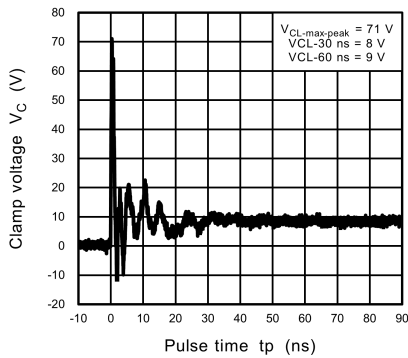
Fig. 10.4.2 $V_C - I_{PP}$



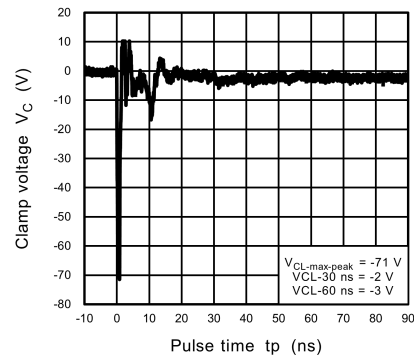
**Fig. 10.4.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.4.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.4.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.4.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.5. XCUZ7V5 Characteristics Curves(Note)

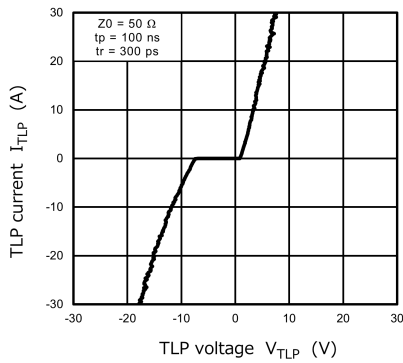


Fig. 10.5.1 $I_{TLP} - V_{TLP}$

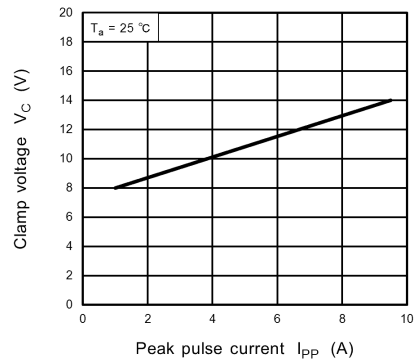
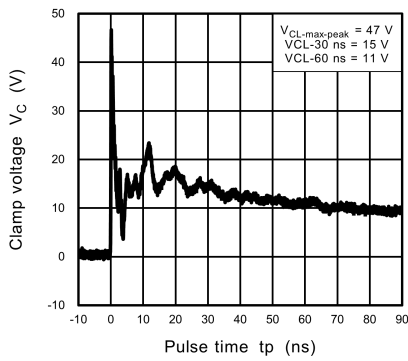
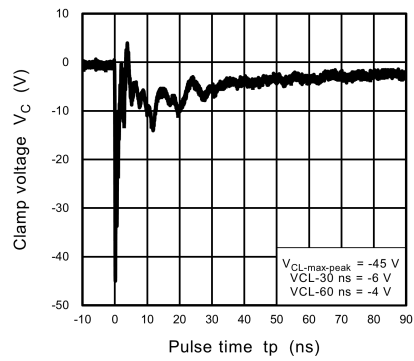


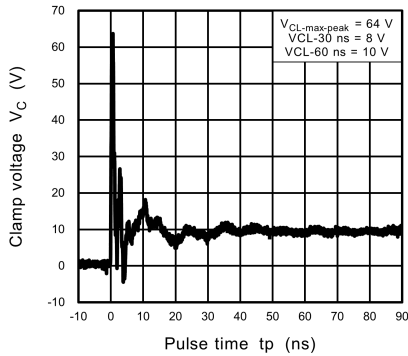
Fig. 10.5.2 $V_C - I_{PP}$



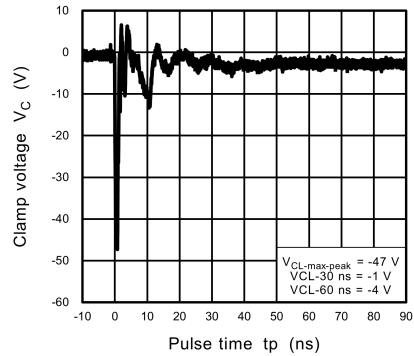
**Fig. 10.5.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.5.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.5.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.5.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current($V_C - I_{PP}$) and clamp waveform measurement circuit.

10.6. XCUZ8V2 Characteristics Curves(Note)

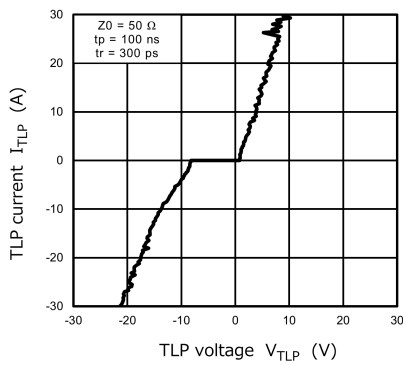


Fig. 10.6.1 $I_{TLP} - V_{TLP}$

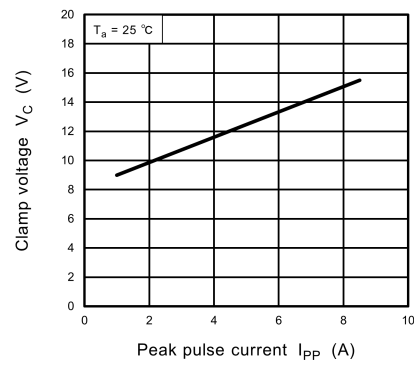
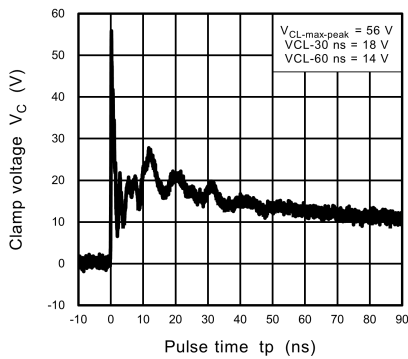
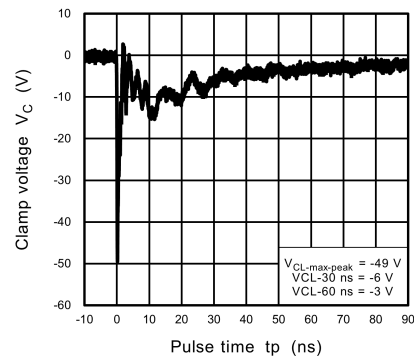


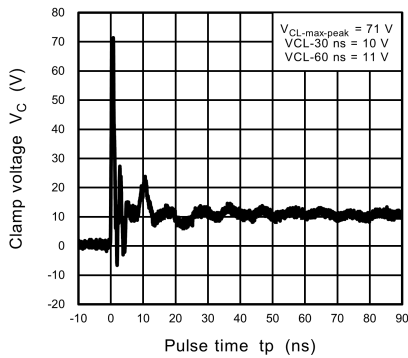
Fig. 10.6.2 $V_C - I_{PP}$



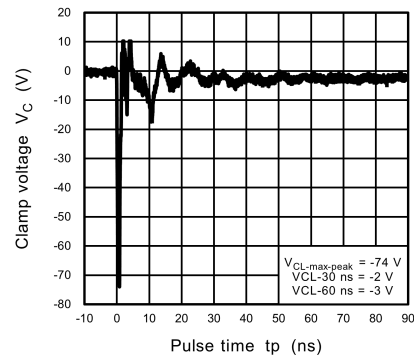
**Fig. 10.6.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.6.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.6.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.6.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current($V_C - I_{PP}$) and clamp waveform measurement circuit.

10.7. XCUZ9V1 Characteristics Curves(Note)

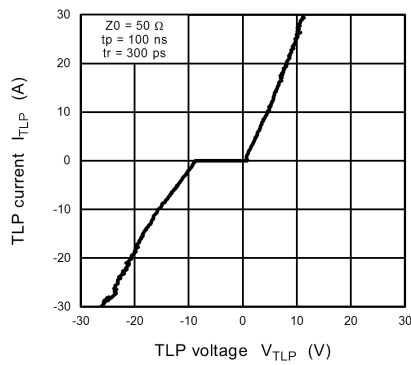


Fig. 10.7.1 $I_{TLP} - V_{TLP}$

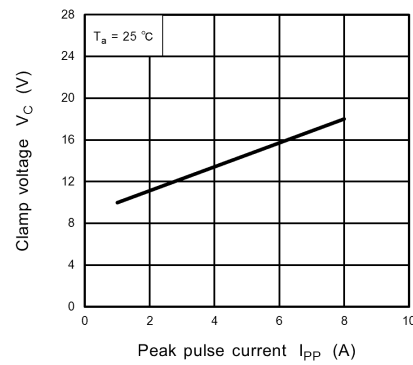
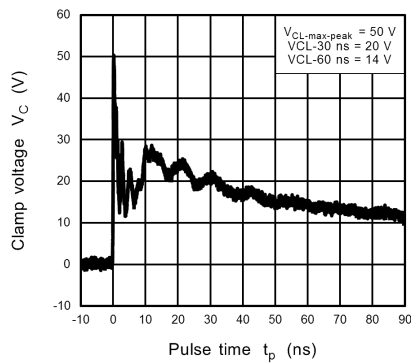
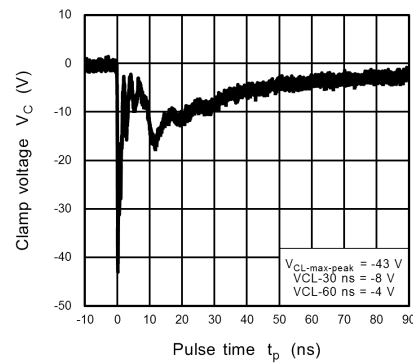


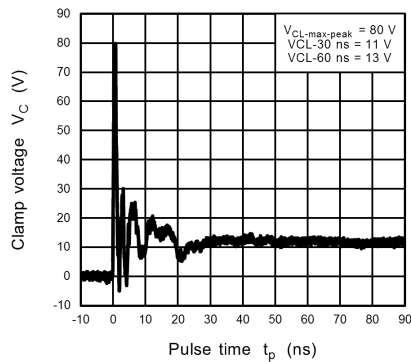
Fig. 10.7.2 $V_C - I_{PP}$



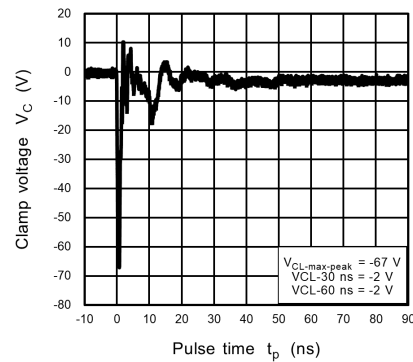
**Fig. 10.7.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.7.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.7.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.7.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.8. XCUZ10V Characteristics Curves(Note)

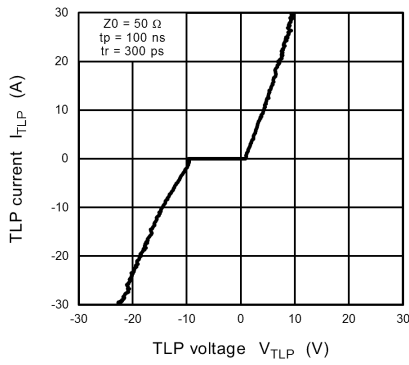


Fig. 10.8.1 $I_{TLP} - V_{TLP}$

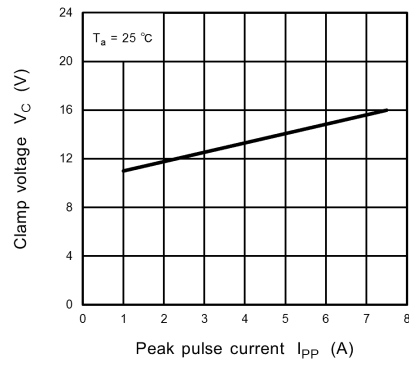


Fig. 10.8.2 $V_C - I_{PP}$

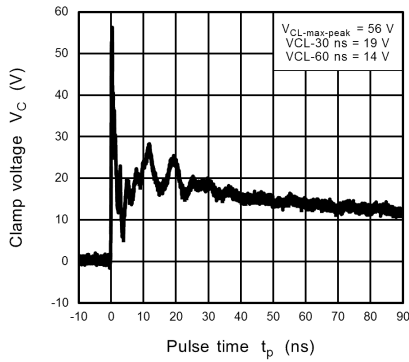


Fig. 10.8.3 IEC61000-4-2
Clamp Waveform +8 kV

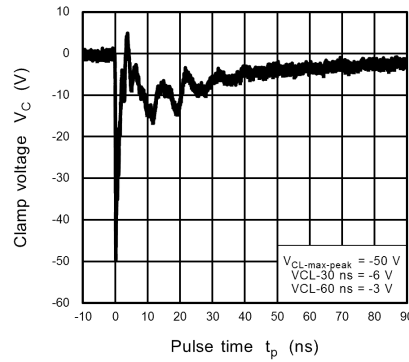


Fig. 10.8.4 IEC61000-4-2
Clamp Waveform -8 kV

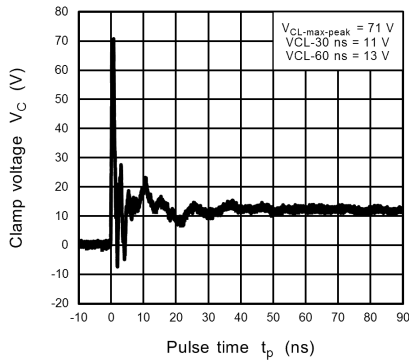


Fig. 10.8.5 ISO10605
Clamp Waveform +8 kV

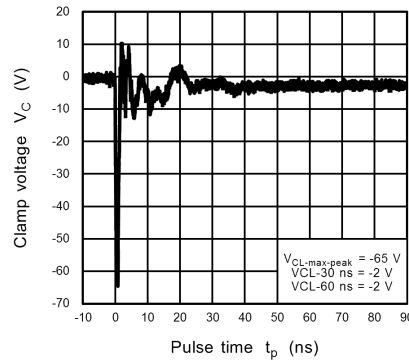


Fig. 10.8.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current($V_C - I_{PP}$) and clamp waveform measurement circuit.

10.9. XCUZ11V Characteristics Curves(Note)

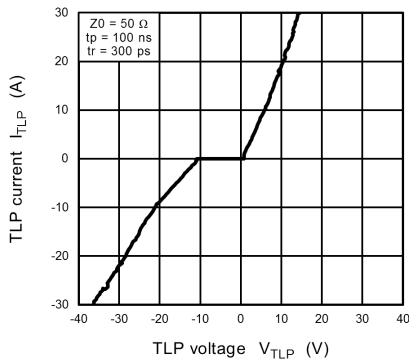


Fig. 10.9.1 $I_{TLP} - V_{TLP}$

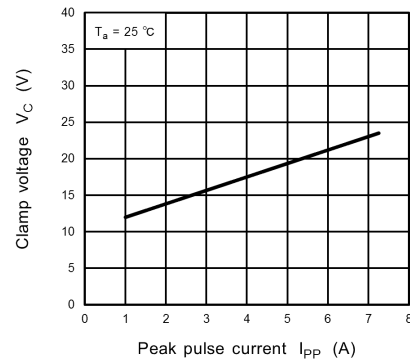
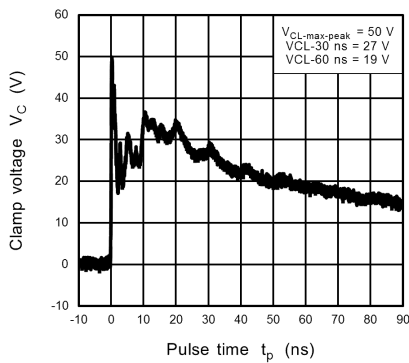
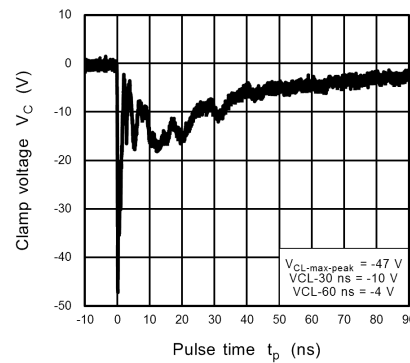


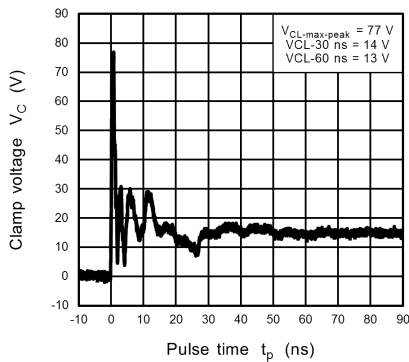
Fig. 10.9.2 $V_C - I_{PP}$



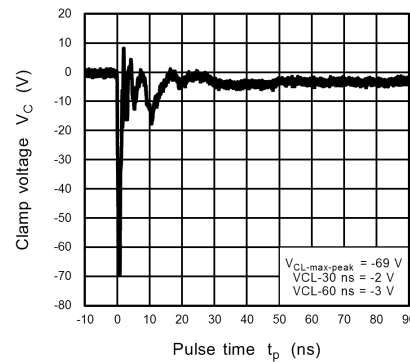
**Fig. 10.9.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.9.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.9.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.9.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.10. XCUZ12V Characteristics Curves(Note)

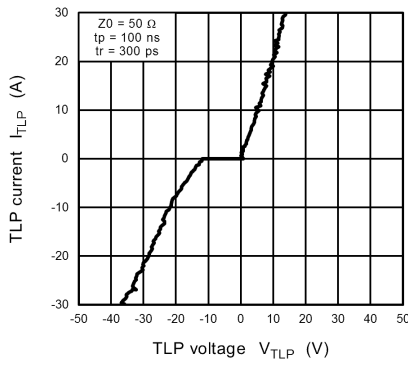


Fig. 10.10.1 $I_{TLP} - V_{TLP}$

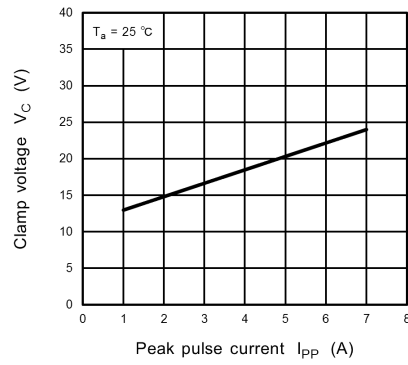
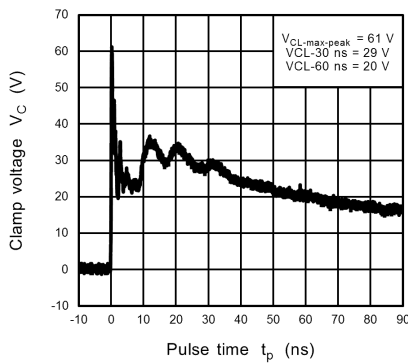
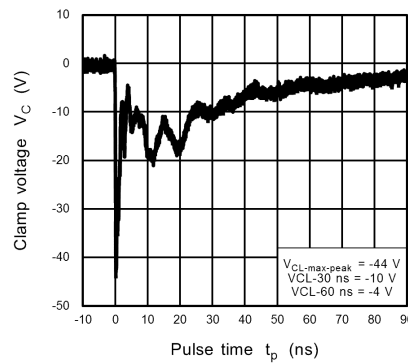


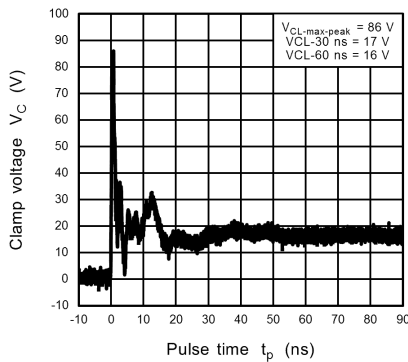
Fig. 10.10.2 $V_C - I_{PP}$



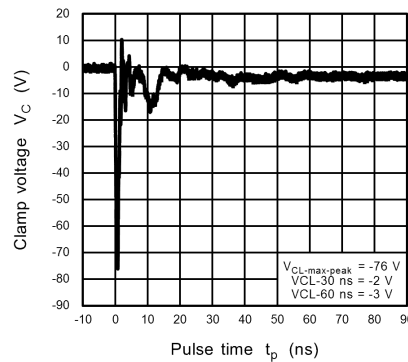
**Fig. 10.10.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.10.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.10.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.10.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.11. XCUZ13V Characteristics Curves(Note)

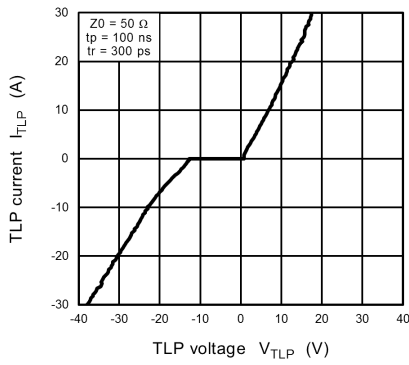


Fig. 10.11.1 $I_{TLP} - V_{TLP}$

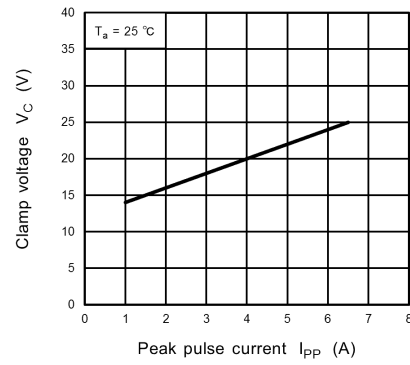
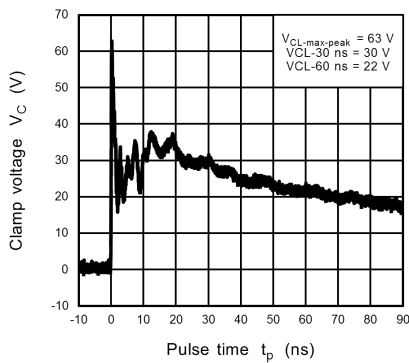
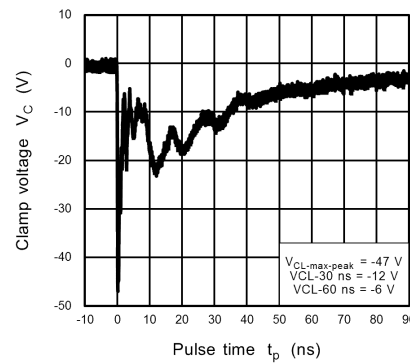


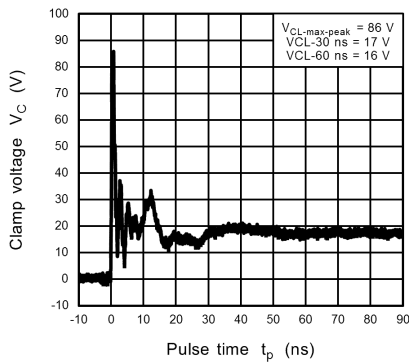
Fig. 10.11.2 $V_C - I_{PP}$



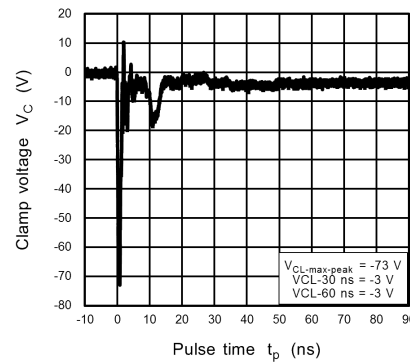
**Fig. 10.11.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.11.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.11.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.11.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C - I_{PP}) and clamp waveform measurement circuit.

10.12. XCUZ15V Characteristics Curves(Note)

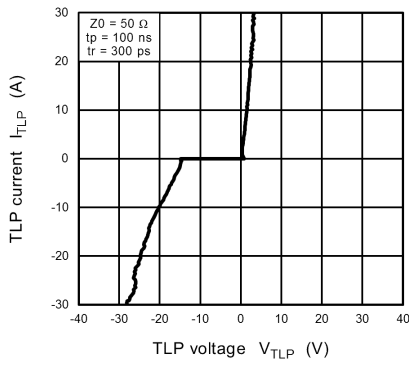


Fig. 10.12.1 $I_{TLP} - V_{TLP}$

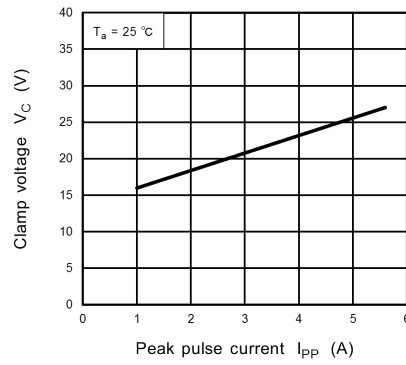


Fig. 10.12.2 $V_C - I_{PP}$

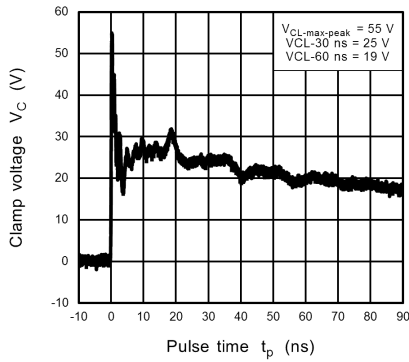


Fig. 10.12.3 IEC61000-4-2
Clamp Waveform +8 kV

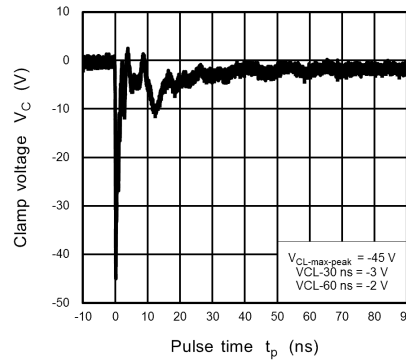


Fig. 10.12.4 IEC61000-4-2
Clamp Waveform -8 kV

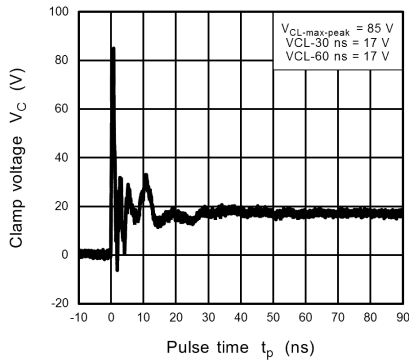


Fig. 10.12.5 ISO10605
Clamp Waveform +8 kV

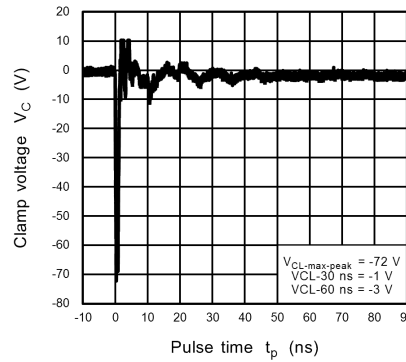


Fig. 10.12.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.13. XCUZ16V Characteristics Curves(Note)

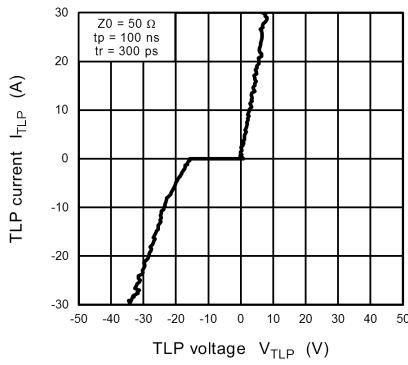


Fig. 10.13.1 $I_{TLP} - V_{TLP}$

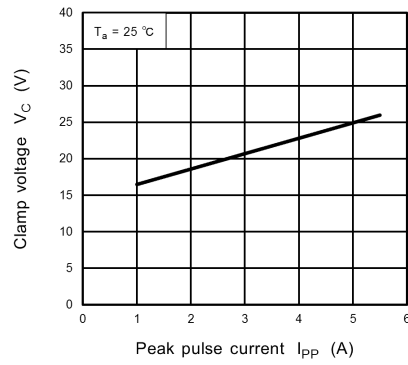
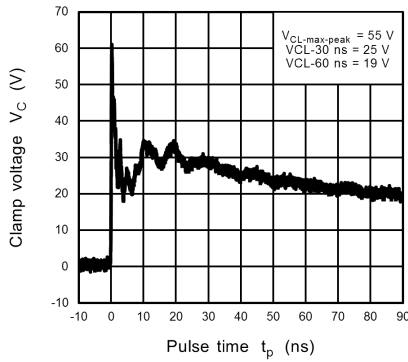
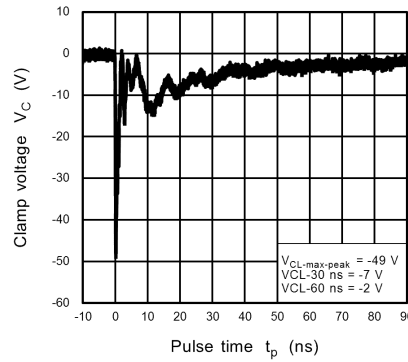


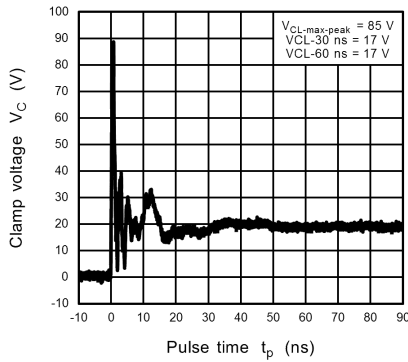
Fig. 10.13.2 $V_C - I_{PP}$



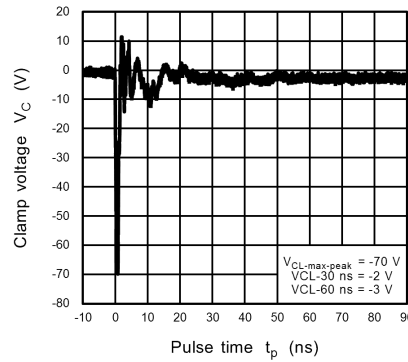
**Fig. 10.13.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.13.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.13.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.13.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.14. XCUZ18V Characteristics Curves(Note)

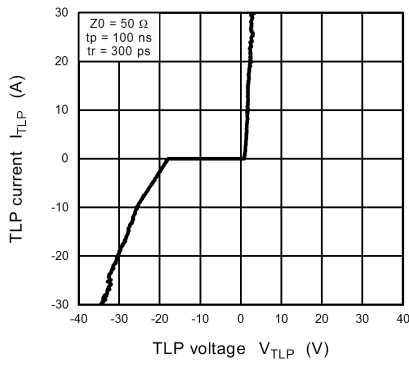


Fig. 10.14.1 $I_{TLP} - V_{TLP}$

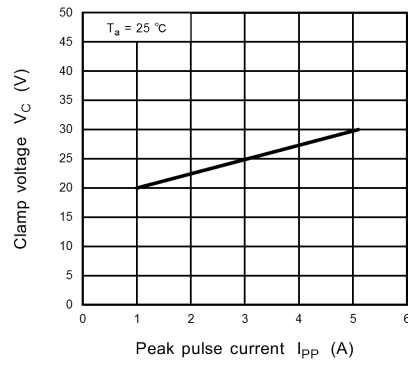


Fig. 10.14.2 $V_C - I_{PP}$

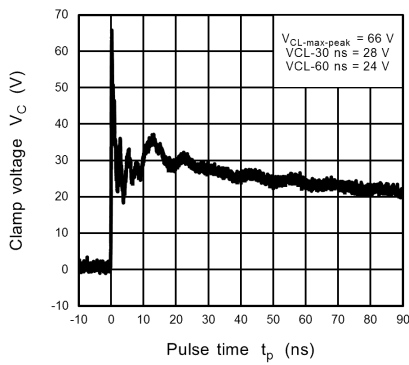


Fig. 10.14.3 IEC61000-4-2
Clamp Waveform +8 kV

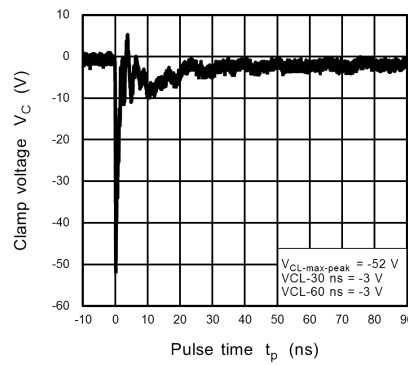


Fig. 10.14.4 IEC61000-4-2
Clamp Waveform -8 kV

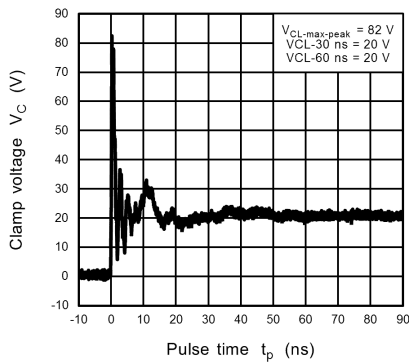


Fig. 10.14.5 ISO10605
Clamp Waveform +8 kV

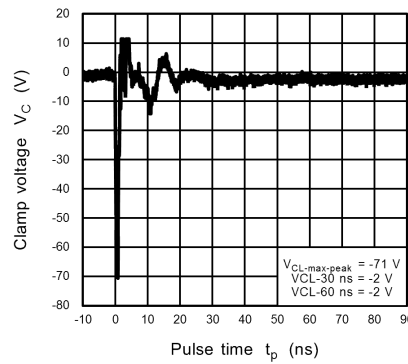


Fig. 10.14.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.15. XCUZ20V Characteristics Curves(Note)

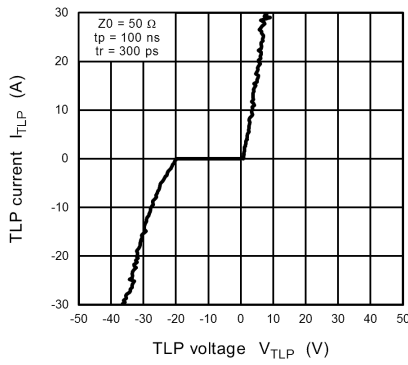


Fig. 10.15.1 $I_{TLP} - V_{TLP}$

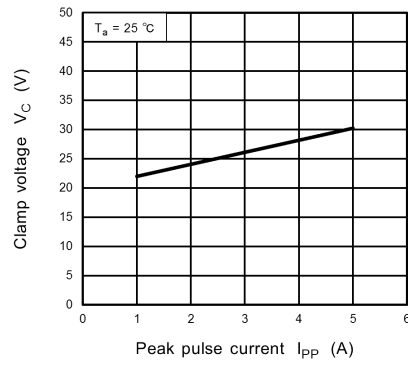
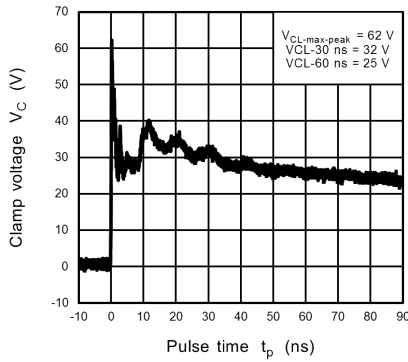
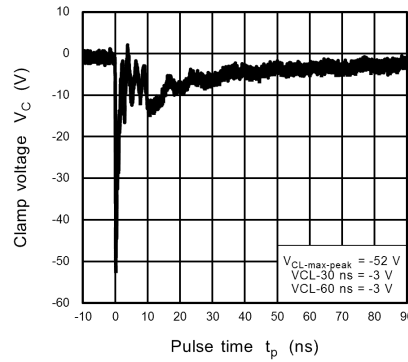


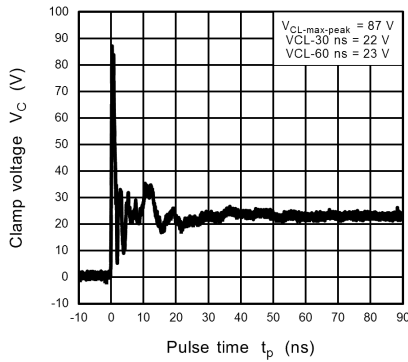
Fig. 10.15.2 $V_C - I_{PP}$



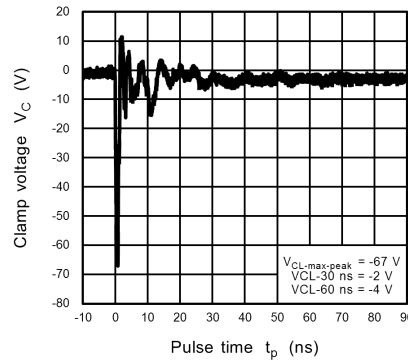
**Fig. 10.15.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.15.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.15.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.15.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.16. XCUZ22V Characteristics Curves(Note)

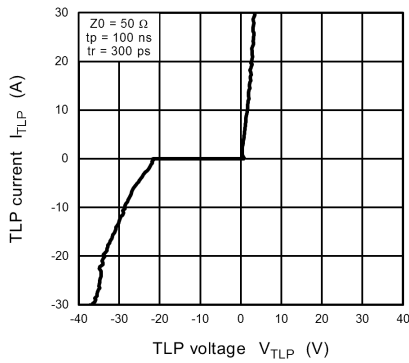


Fig. 10.16.1 $I_{TLP} - V_{TLP}$

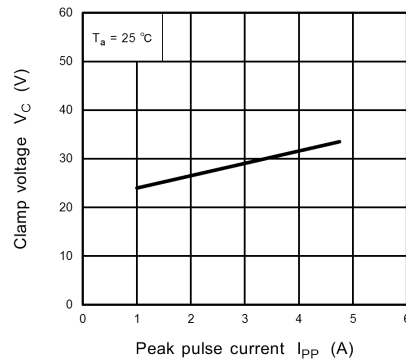


Fig. 10.16.2 $V_C - I_{PP}$

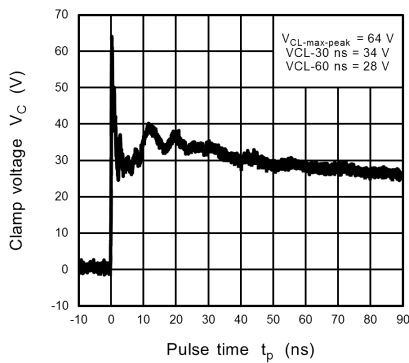


Fig. 10.16.3 IEC61000-4-2
Clamp Waveform +8 kV

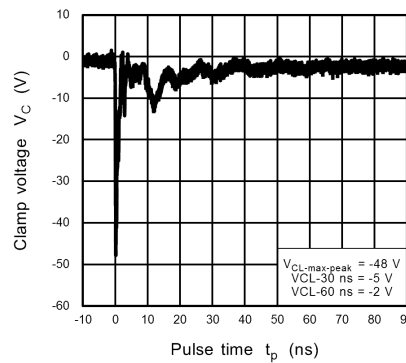


Fig. 10.16.4 IEC61000-4-2
Clamp Waveform -8 kV

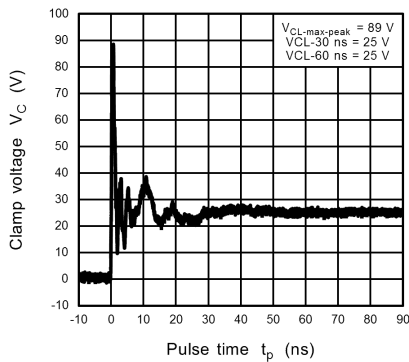


Fig. 10.16.5 ISO10605
Clamp Waveform +8 kV

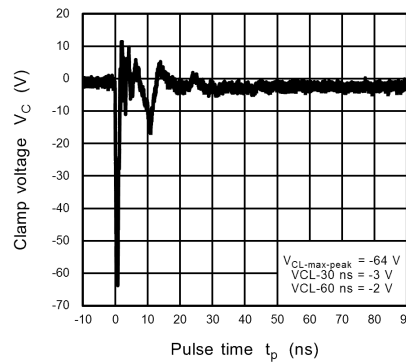


Fig. 10.16.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.17. XCUZ24V Characteristics Curves(Note)

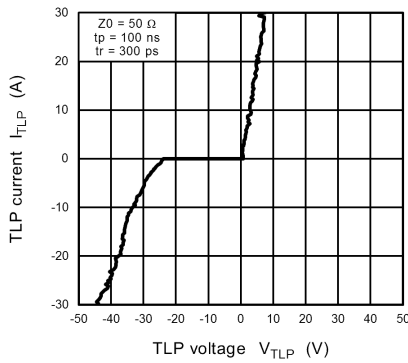


Fig. 10.17.1 $I_{TLP} - V_{TLP}$

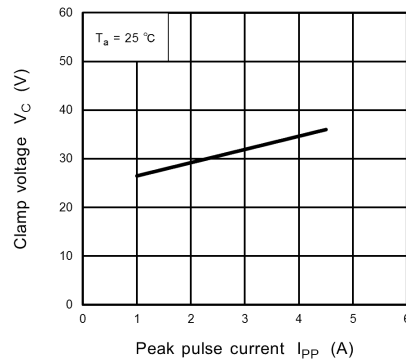


Fig. 10.17.2 $V_C - I_{PP}$

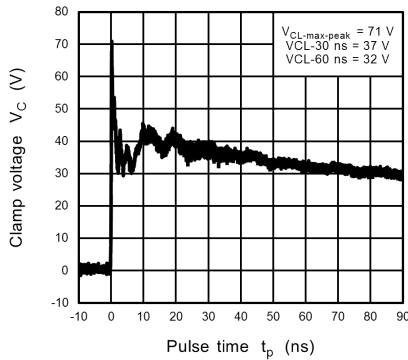


Fig. 10.17.3 IEC61000-4-2
Clamp Waveform +8 kV

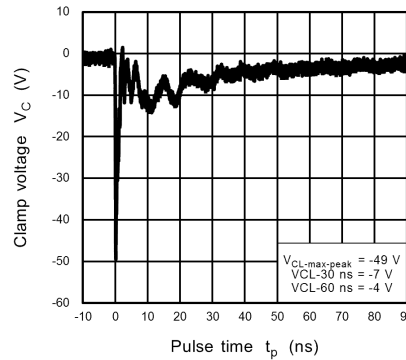


Fig. 10.17.4 IEC61000-4-2
Clamp Waveform -8 kV

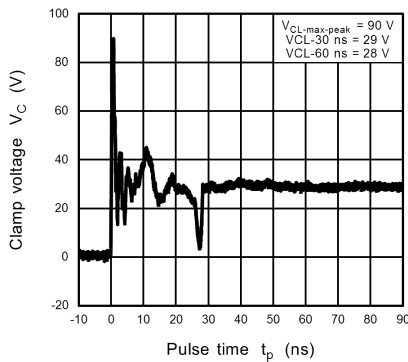


Fig. 10.17.5 ISO10605
Clamp Waveform +8 kV

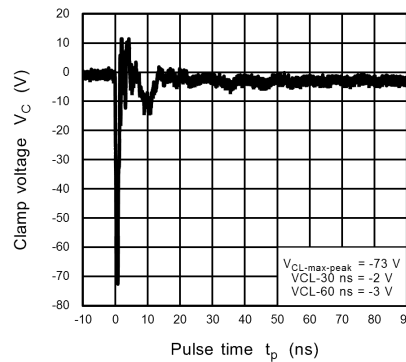


Fig. 10.17.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.18. XCUZ27V Characteristics Curves(Note)

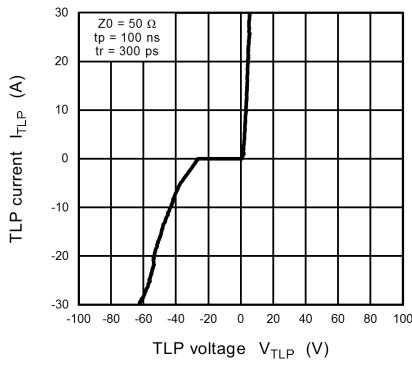


Fig. 10.18.1 $I_{TLP} - V_{TLP}$

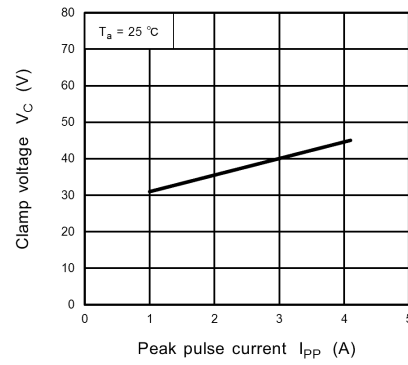


Fig. 10.18.2 $V_C - I_{PP}$

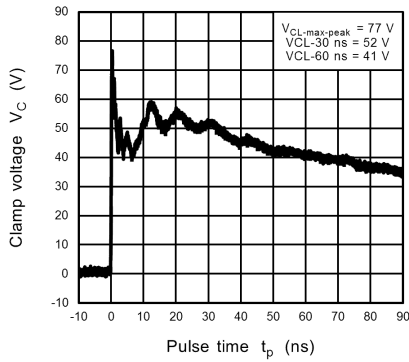


Fig. 10.18.3 IEC61000-4-2
Clamp Waveform +8 kV

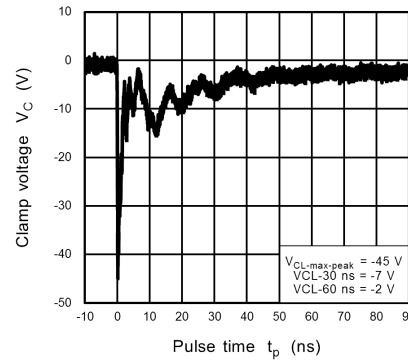


Fig. 10.18.4 IEC61000-4-2
Clamp Waveform -8 kV

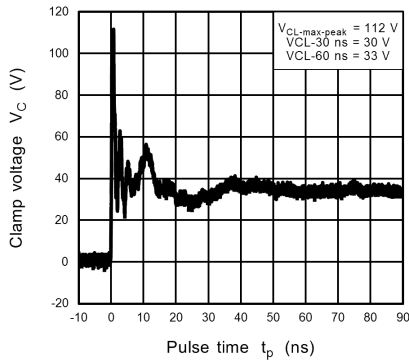


Fig. 10.18.5 ISO10605
Clamp Waveform +8 kV

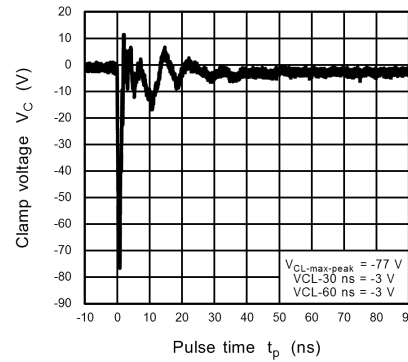


Fig. 10.18.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.19. XCUZ30V Characteristics Curves(Note)

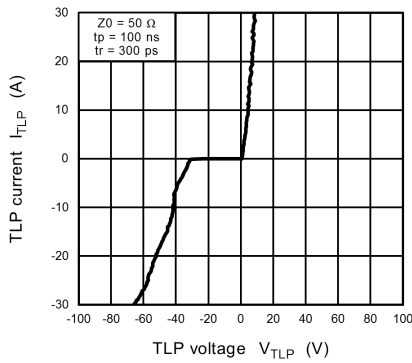


Fig. 10.19.1 $I_{TLP} - V_{TLP}$

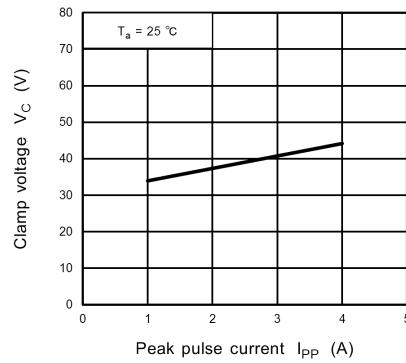


Fig. 10.19.2 $V_C - I_{PP}$

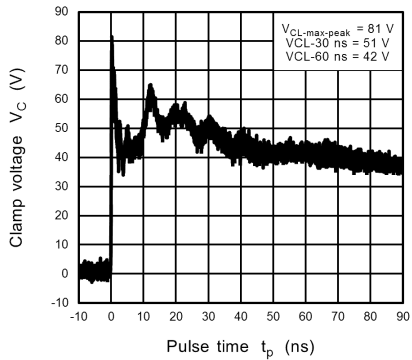


Fig. 10.19.3 IEC61000-4-2
Clamp Waveform +8 kV

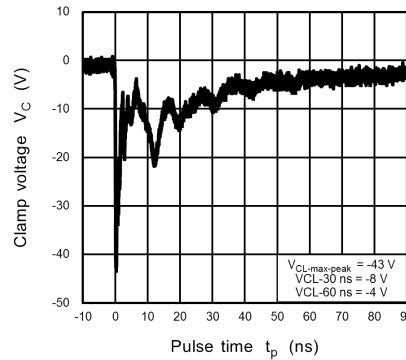


Fig. 10.19.4 IEC61000-4-2
Clamp Waveform -8 kV

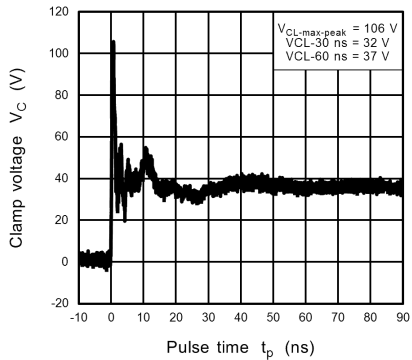


Fig. 10.19.5 ISO10605
Clamp Waveform +8 kV

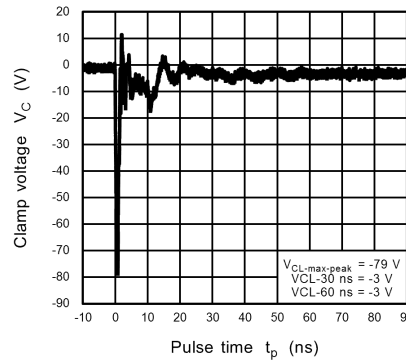


Fig. 10.19.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.20. XCUZ33V Characteristics Curves(Note)

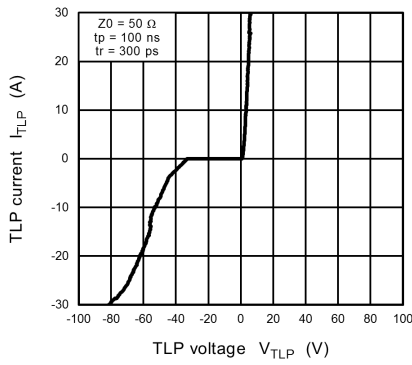


Fig. 10.20.1 $I_{TLP} - V_{TLP}$

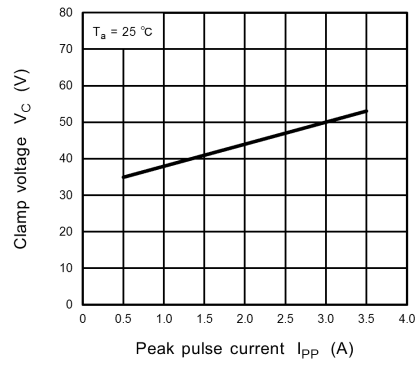
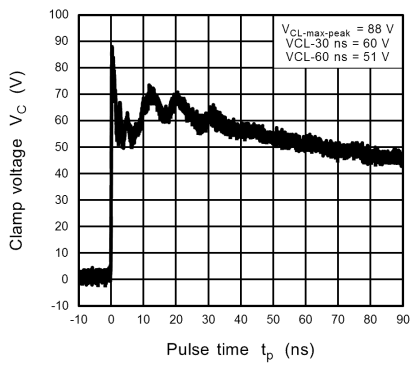
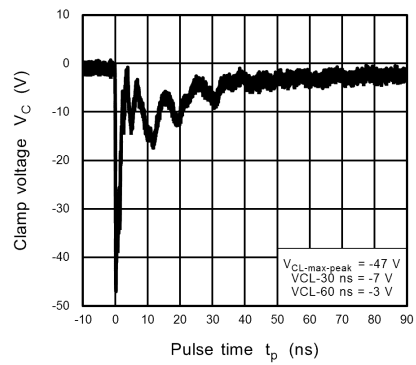


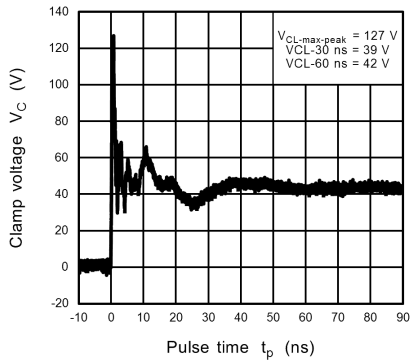
Fig. 10.20.2 $V_C - I_{PP}$



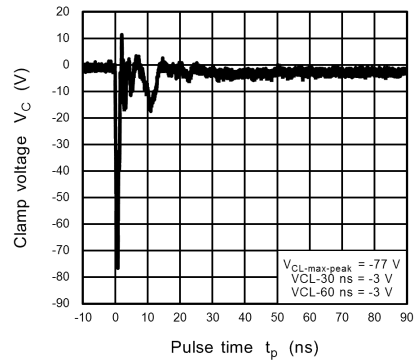
**Fig. 10.20.3 IEC61000-4-2
Clamp Waveform +8 kV**



**Fig. 10.20.4 IEC61000-4-2
Clamp Waveform -8 kV**



**Fig. 10.20.5 ISO10605
Clamp Waveform +8 kV**



**Fig. 10.20.6 ISO10605
Clamp Waveform -8 kV**

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

Refer to Fig.10.22.1, Fig.10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.21. XCUZ36V Characteristics Curves(Note)

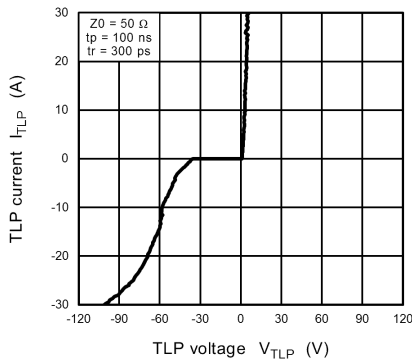


Fig. 10.21.1 $I_{TLP} - V_{TLP}$

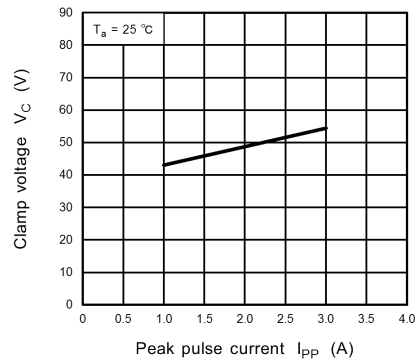


Fig. 10.21.2 $V_C - I_{PP}$

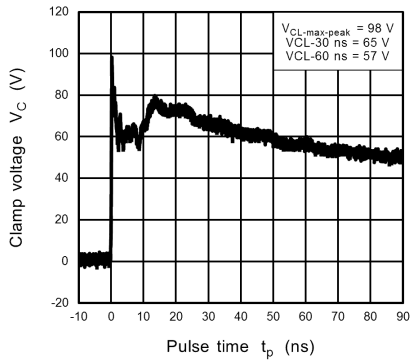


Fig. 10.21.3 IEC61000-4-2
Clamp Waveform +8 kV

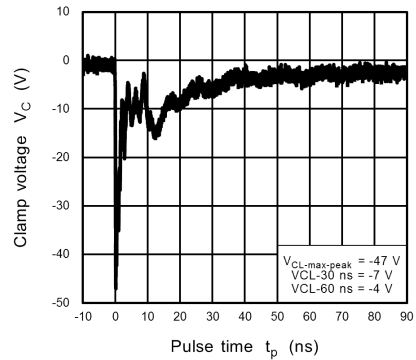


Fig. 10.21.4 IEC61000-4-2
Clamp Waveform -8 kV

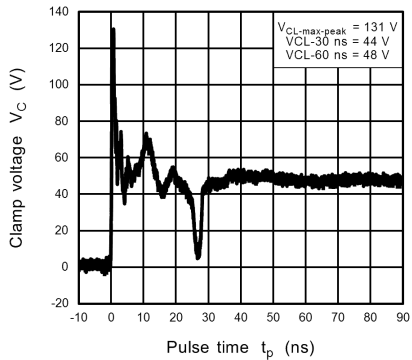


Fig. 10.21.5 ISO10605
Clamp Waveform +8 kV

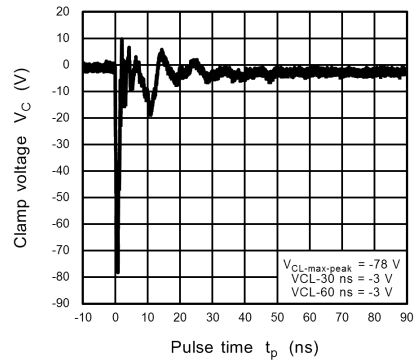


Fig. 10.21.6 ISO10605
Clamp Waveform -8 kV

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

Refer to Fig.10.22.1, Fig. 10.22.2, Fig.10.22.3 for peak pulse current(V_C-I_{PP}) and clamp waveform measurement circuit.

10.22. V_C - I_{PP} Peak Pulse and Clamp waveform measurement circuit

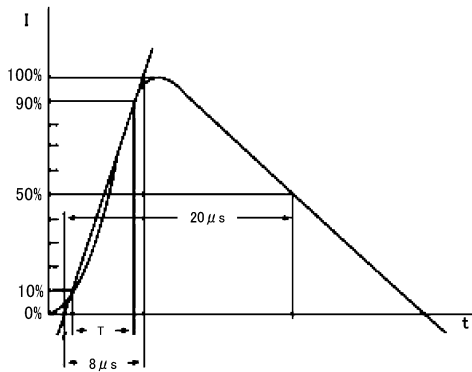


Fig. 10.22.1 V_C - I_{PP} Peak Pulse Current (according to IEC61000-4-5 8/20 μs pulse)

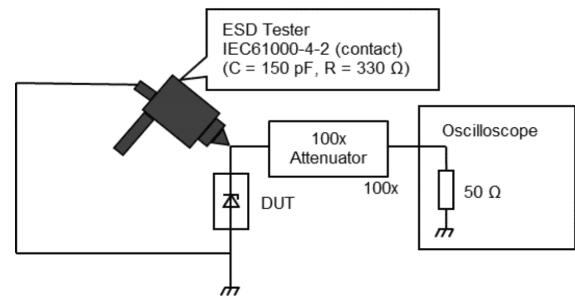


Fig. 10.22.2 Clamp waveform measurement circuit (according to IEC61000-4-2)

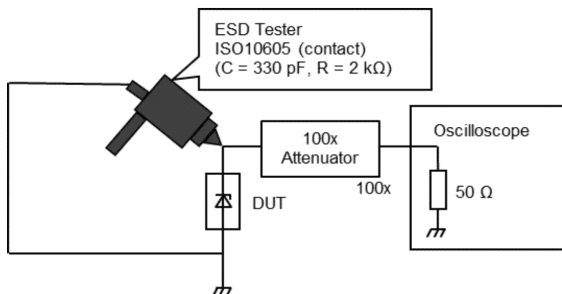
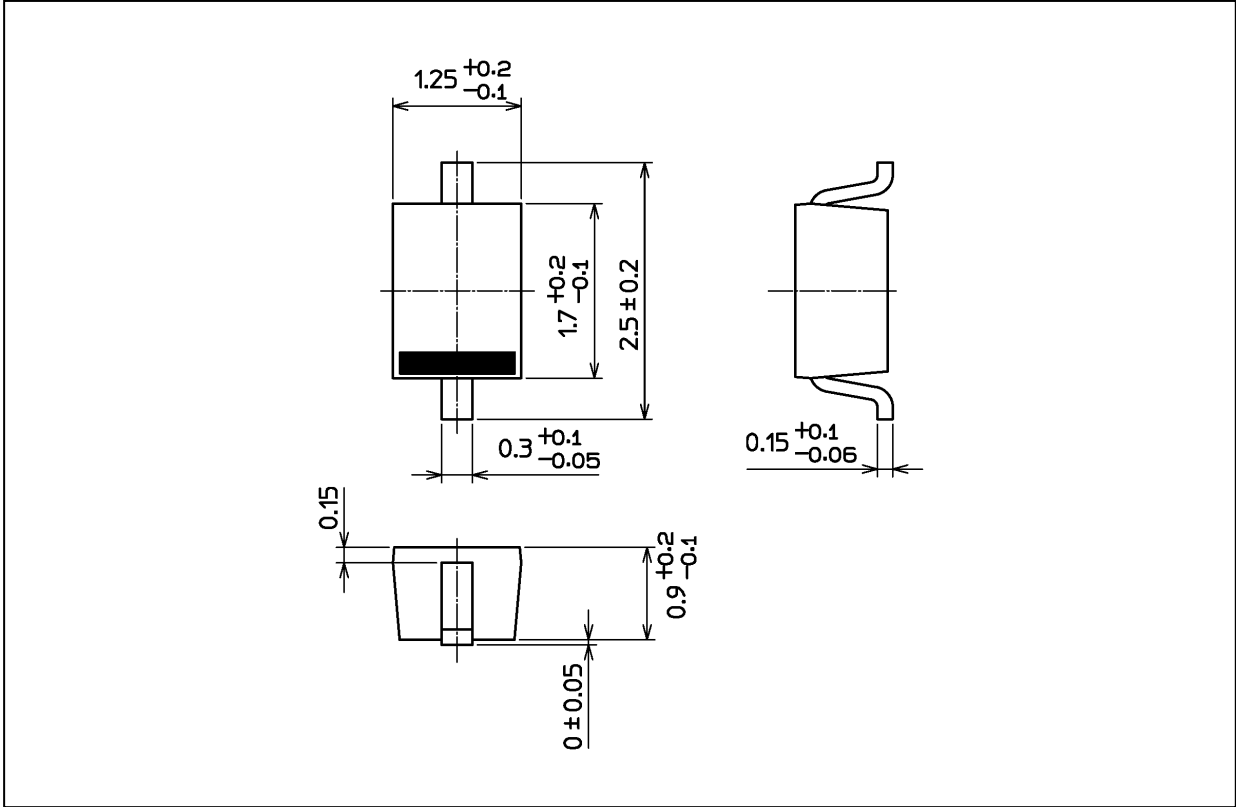


Fig. 10.22.3 Clamp waveform measurement circuit (according to ISO10605)

Package Dimensions

Unit: mm



Weight: 4.5 mg (typ.)

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

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