Schottky Barrier Diode Silicon Epitaxial

# CES388

## 1. Applications

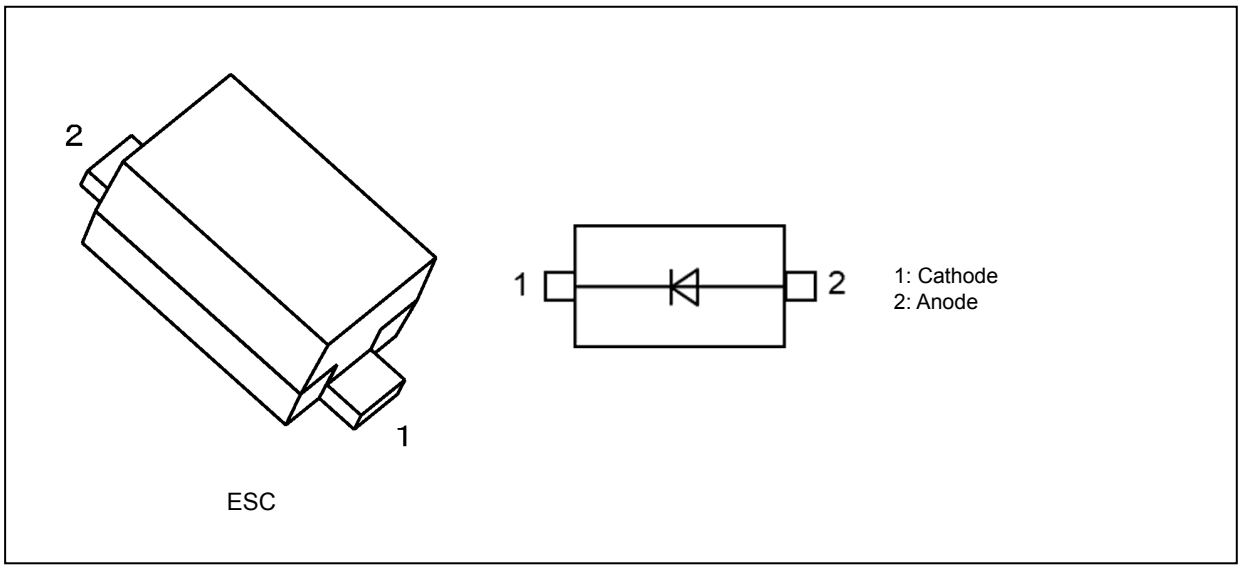
- High-Speed Switching

## 2. Features

(1) AEC-Q101 qualified (Note 1)
(2) Low forward voltage : $V_{F(3)}$ = 0.54 V (typ).
(3) Low reverse current : $I_{R(1)}$ = 1 μA (max).
(4) Small and compact ESC package, equivalent to SOD-523 and SC-79 packages.

Note 1: For detail information, please contact our sales.

## 3. Packaging and Internal Circuit




Start of commercial production
2011-10

## 4. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a$ = 25°C)

| Characteristics | Symbol | Note | Rating | Unit |
|---|---|---|---|---|
| Peak reverse voltage | $V_{RM}$ | | 45 | V |
| Reverse voltage | $V_R$ | | 40 | |
| Peak forward current | $I_{FM}$ | | 300 | mA |
| Average rectified current | $I_O$ | — | 100 | |
| Non-repetitive peak forward surge current | $I_{FSM}$ | (Note 1) | 1 | A |
| Power dissipation | $P_D$ | (Note 2) | 150 | mW |
| Junction temperature | $T_j$ | | 125 | °C |
| Storage temperature | $T_{stg}$ | | -55 to 125 | |

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: Measured with a 10ms pulse.

Note 2: Mounted on a glass-epoxy circuit board of 20 mm × 20 mm, Pad dimension of 4 mm × 4 mm.

## 5. Electrical Characteristics (Unless otherwise specified, $T_a$ = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Forward voltage | $V_{F(1)}$ | $I_F$ = 1 mA | — | 0.21 | — | V |
| | $V_{F(2)}$ | $I_F$ = 10 mA | — | 0.30 | — | |
| | $V_{F(3)}$ | $I_F$ = 100 mA | — | 0.54 | 0.60 | |
| Reverse current | $I_{R(1)}$ | $V_R$ = 10 V | — | — | 1 | μA |
| | $I_{R(2)}$ | $V_R$ = 40 V | — | — | 5 | |
| Total capacitance | $C_t$ | $V_R$ = 0 V, f = 1 MHz | — | 11 | 25 | pF |

## 6. Marking

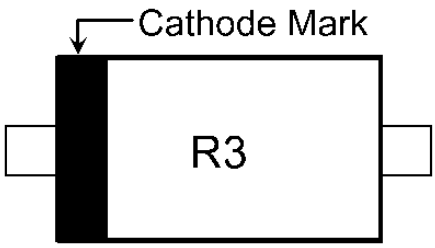



Fig. 6.1 Marking

| Marking Code | Part Number |
|---|---|
| R3 | CES388 |

## 7. Usage Considerations

- Schottky barrier diodes (SBDs) have reverse leakage greater than other types of diodes. This makes SBDs more susceptible to thermal runaway under high-temperature and high-voltage conditions. Thus, both forward and reverse power losses of SBDs should be considered for thermal and safety design.

## 8. Land pattern dimensions for reference only

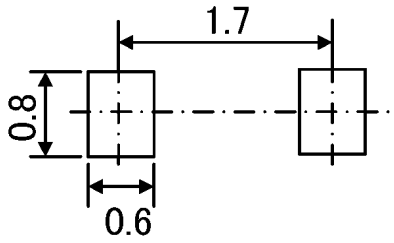



Fig. 8.1 Land pattern dimensions for reference only (Unit: mm)

## 9. Characteristics Curves (Note)

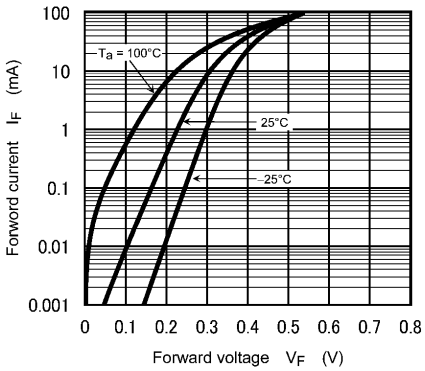



Fig. 9.1 $I_F$ - $V_F$

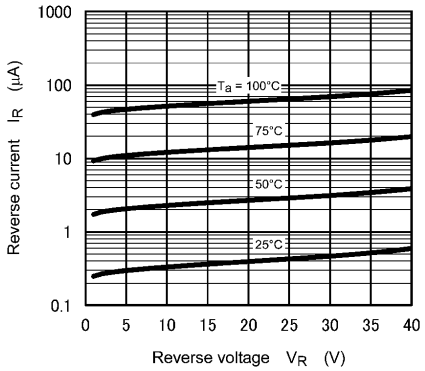



Fig. 9.2 $I_R$ - $V_R$

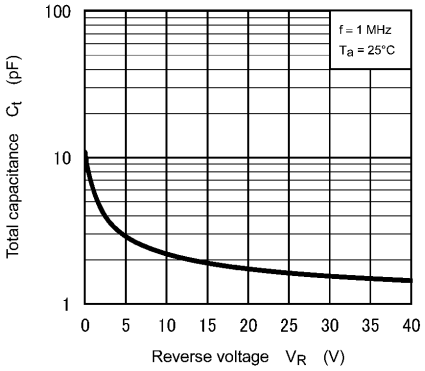
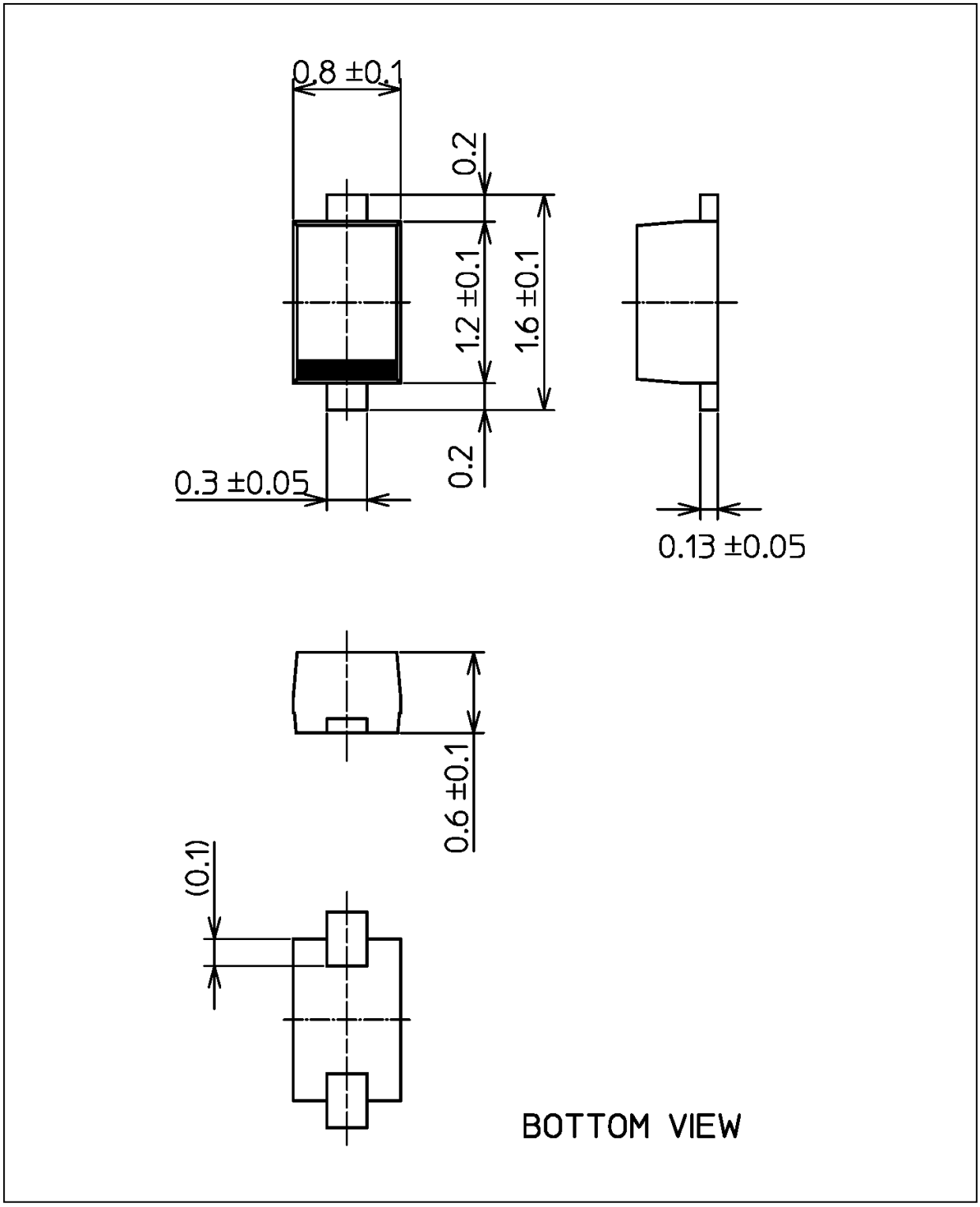



Fig. 9.3 $C_t$ - $V_R$

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

## Package Dimensions

Unit: mm




Weight: 1.4 mg (typ.)

| Package Name(s) |
| --- |
| Nickname: ESC |

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