

TRS24N65D

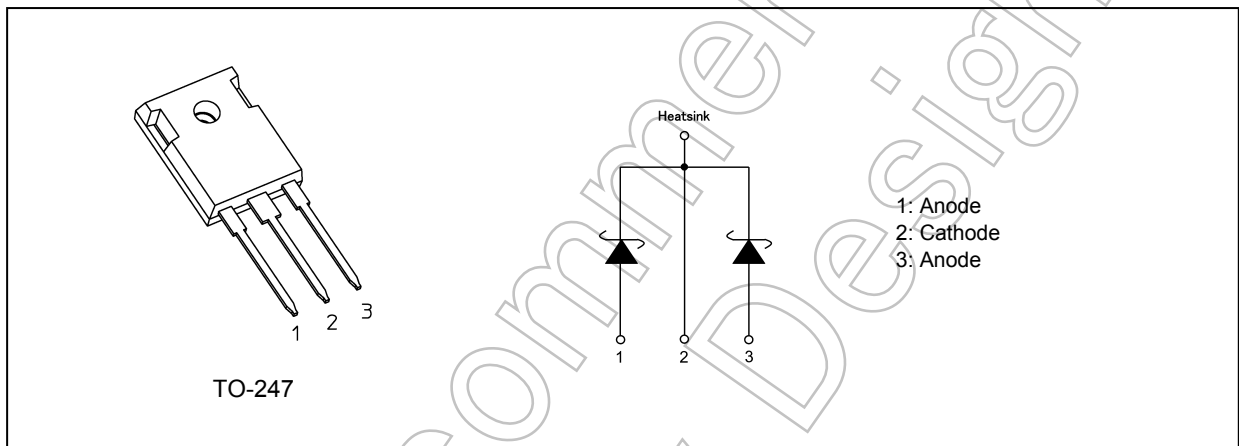
1. Applications

- Power Factor Correction
- Solar Inverters
- Uninterruptible Power Supplies
- DC-DC Converters

2. Features

- (1) Forward DC current(Per Leg/Both Legs) $I_{F(DC)} = 12/24$ A
- (2) Repetitive peak reverse voltage $V_{RRM} = 650$ V

3. Packaging and Internal Circuit Pin Assignment



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

| Characteristics | Symbol | Note | Rating | Unit |
|---------------------------------|-------------|----------|------------|------------------|
| Repetitive peak reverse voltage | V_{RRM} | | 650 | V |
| Forward DC current | $I_{F(DC)}$ | | 12 | A |
| Forward DC current | | | 24 | |
| Forward pulse current | I_{FP} | (Note 1) | 110 | |
| Forward pulse current | | | 220 | |
| I^2t limit value | I^2t | (Note 2) | 18.0 | A ² s |
| I^2t limit value | | | 72.0 | |
| Junction temperature | T_j | | 175 | °C |
| Storage temperature | T_{stg} | | -55 to 175 | |
| Mounting torque | TOR | | 0.8 | N · m |

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: $t = 100$ μ s

Note 2: $f = 50$ Hz

Start of commercial production

2014-02

5. Thermal Characteristics

| Characteristics | Symbol | Test Condition | Max | Unit |
|--|---------------|----------------|------|------|
| Thermal resistance (junction-to-case) | $R_{th(j-c)}$ | Per Leg | 1.68 | °C/W |
| | | Both Legs | 0.84 | |
| Thermal resistance (junction-to-ambient) | $R_{th(j-a)}$ | — | 50 | |

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

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------------------|-------------|--|-----|------|-----|------|
| Peak forward voltage | $V_{FM(1)}$ | $I_F = 6\text{ A}$ Per Leg (pulse measurement) | — | 1.27 | — | V |
| | $V_{FM(2)}$ | $I_F = 12\text{ A}$ Per Leg (pulse measurement) | — | 1.54 | 1.7 | |
| | $V_{FM(3)}$ | $I_F = 24\text{ A}$ Both Legs (pulse measurement) | — | 1.54 | 1.7 | |
| Repetitive peak reverse current | I_{RRM} | $V_{RRM} = 650\text{ V}$ Per Leg (pulse measurement) | — | 0.43 | 90 | μA |
| Junction capacitance | C_j | $V_R = 650\text{ V}$, $f = 1\text{ MHz}$ Per Leg | — | 65 | — | pF |

7. Marking

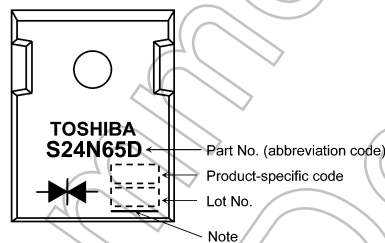


Fig. 7.1 Marking

Note: A line under a Lot No. identifies the indication of product Labels.

[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

| Abbreviation Code | Part Number |
|-------------------|-------------|
| S24N65D | TRS24N65D |

8. Usage Considerations

- The absolute maximum ratings are rated values that must not be exceeded during operation, even for an instant. The following are the recommended general derating methods for designing a circuit board using this device.

V_{RRM} : V_{RRM} has a temperature coefficient of 0.1 %/°C.

Take this coefficient into account when designing a circuit board that will be operated in a low-temperature environment.

$I_{F(DC)}$: We recommend that the worst-case current be no greater than 80 % of the absolute maximum rating of $I_{F(DC)}$ and that the worst-case junction temperature, T_j , be kept below 140 °C.

I_{FP} : We recommend that the worst-case current be no greater than 80 % of the absolute maximum rating of I_{FP} and that the worst-case junction temperature, T_j , be kept below 140 °C.

I^2t : This rating specifies a non-repetitive limit value.

This only applies to an abnormal operation, which seldom occurs during the lifespan of a device.

T_j : Derate device parameters in proportion to this rating in order to ensure high reliability.

We recommend that the junction temperature (T_j) of a device be kept below 140 °C.

- For other design considerations, see the Rectifiers databook or the Toshiba Semiconductor website.

9. Characteristics Curves (Note)

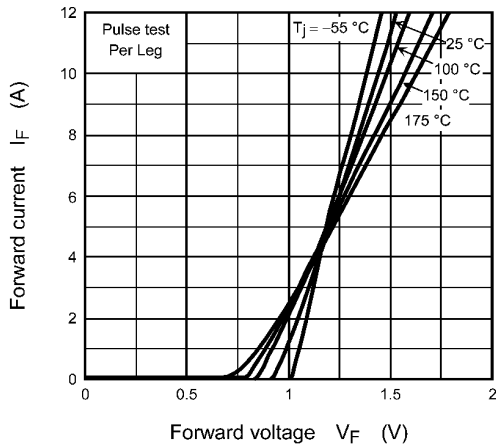


Fig. 9.1 $I_F - V_F$

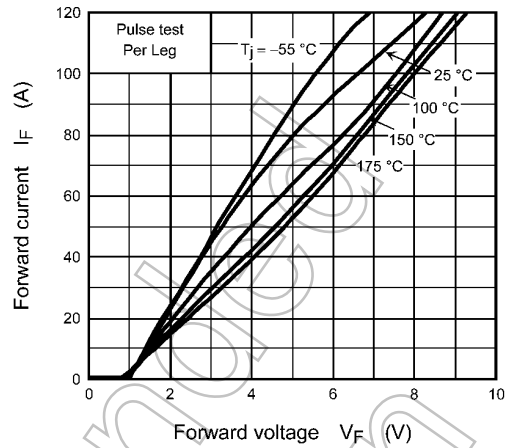


Fig. 9.2 $I_F - V_F$

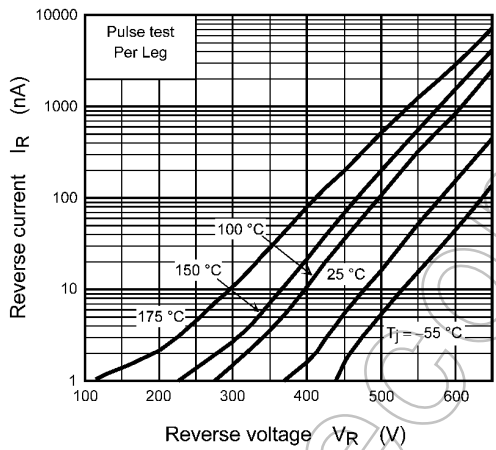


Fig. 9.3 $I_R - V_R$

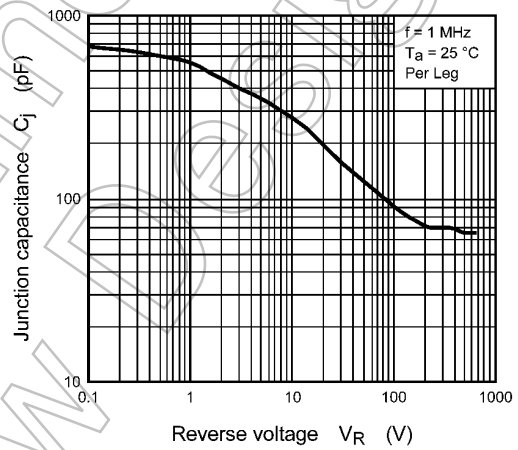
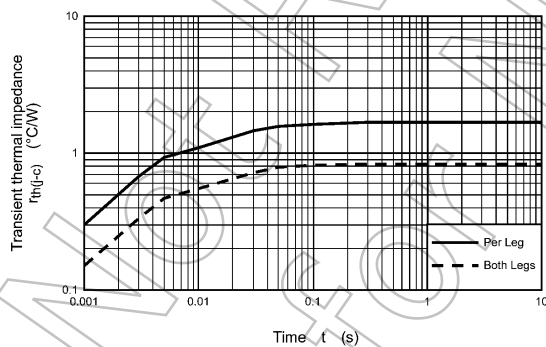


Fig. 9.4 $C_j - V_R$

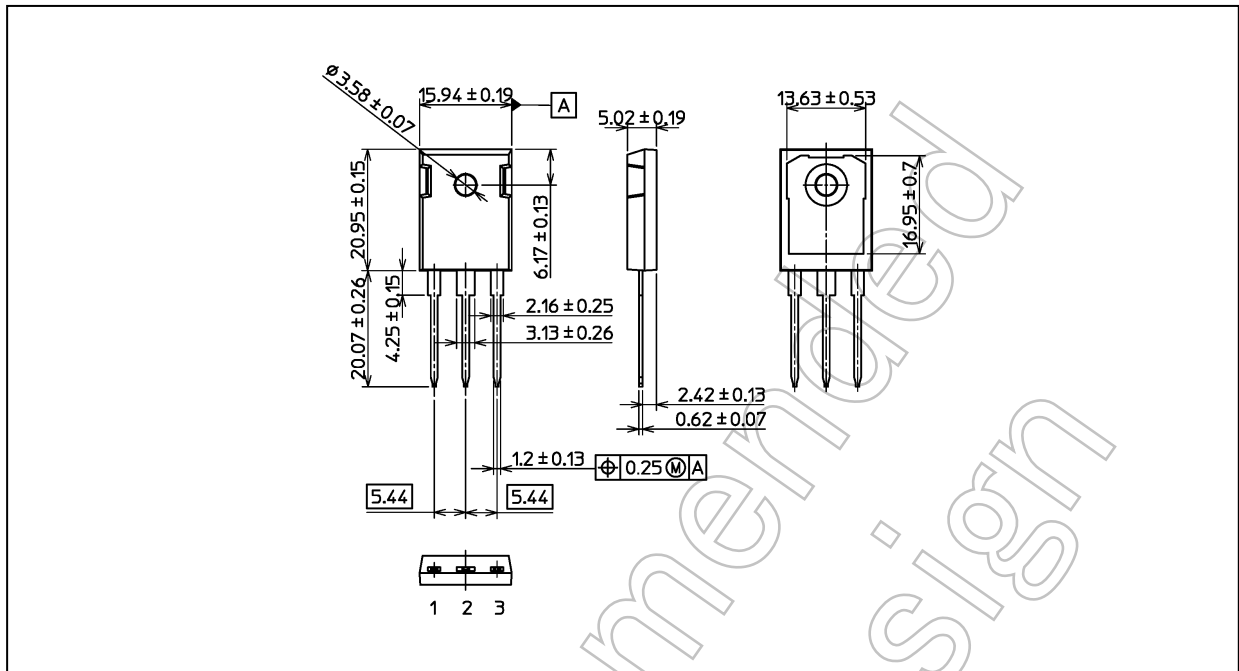


**Fig. 9.5 $r_{th(j-c)} - t$
(Guaranteed Maximum)**

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

Package Dimensions

Unit: mm



Weight: 6.15 g (typ.)

| Package Name(s) |
|------------------|
| TOSHIBA: 2-16L1A |
| Nickname: TO-247 |

Not Recommended for New Design

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