

## 20A, 100V - 200V Trench Schottky Surface Mount Rectifier

### FEATURES

- Patented Trench Schottky technology
- Excellent high temperature stability
- Low forward voltage
- Low power loss/ high efficiency
- High forward surge capability
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

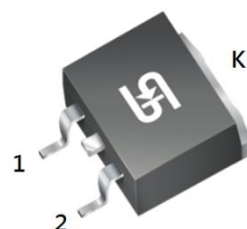
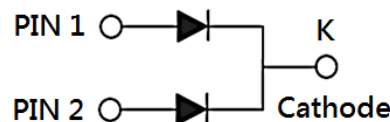
### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- DC to DC converters

### MECHANICAL DATA

- Case: TO-263AB (D<sup>2</sup>PAK)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: As marked
- Weight: 1.60g (approximately)

| KEY PARAMETERS |                               |      |
|----------------|-------------------------------|------|
| PARAMETER      | VALUE                         | UNIT |
| $I_F$          | 20                            | A    |
| $V_{RRM}$      | 100 - 200                     | V    |
| $I_{FSM}$      | 100                           | A    |
| $T_{JMAX}$     | 150                           | °C   |
| Package        | TO-263AB (D <sup>2</sup> PAK) |      |
| Configuration  | Dual dies                     |      |


**TO-263AB (D<sup>2</sup>PAK)**


| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |                 |                 |                 |                 |                  |
|--|--------------|-----------------|-----------------|-----------------|-----------------|------------------|
| PARAMETER  | SYMBOL       | TSD20H<br>100CW | TSD20H<br>120CW | TSD20H<br>150CW | TSD20H<br>200CW | UNIT             |
| Marking code on the device   |              | TSD20H<br>100CW | TSD20H<br>120CW | TSD20H<br>150CW | TSD20H<br>200CW |                  |
| Repetitive peak reverse voltage  | $V_{RRM}$    | 100             | 120             | 150             | 200             | V                |
| Reverse voltage, total rms value   | $V_{R(RMS)}$ | 70              | 84              | 105             | 140             | V                |
| Forward current  | $I_F$        | 20              |                 |                 |                 | A                |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$    | 100             |                 |                 |                 | A                |
| Critical rate of rise of off-state voltage   | dv/dt        | 10,000          |                 |                 |                 | V/ $\mu\text{s}$ |
| Junction temperature   | $T_J$        | - 55 to +150    |                 |                 |                 | °C               |
| Storage temperature  | $T_{STG}$    | - 55 to +150    |                 |                 |                 | °C               |

| <b>THERMAL PERFORMANCE</b>          |                 |            |             |
|-------------------------------------|-----------------|------------|-------------|
| <b>PARAMETER</b>                    | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b> |
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 3.8        | °C/W        |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 2.8        | °C/W        |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |             |   |               |            |            |               |
|---|-------------|---|---------------|------------|------------|---------------|
| <b>PARAMETER</b>  |             | <b>CONDITIONS</b>                           | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b>   |
| Forward voltage per diode <sup>(1)</sup>  | TSD20H100CW | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$   | $V_F$         | 0.57       | -          | V             |
|   | TSD20H120CW |   |               | 0.62       | -          | V             |
|   | TSD20H150CW |   |               | 0.72       | -          | V             |
|   | TSD20H200CW |   |               | 0.77       | -          | V             |
|   | TSD20H100CW | $I_F = 10\text{A}, T_J = 25^\circ\text{C}$  |               | 0.67       | 0.79       | V             |
|   | TSD20H120CW |   |               | 0.78       | 0.87       | V             |
|   | TSD20H150CW |   |               | 0.81       | 0.90       | V             |
|   | TSD20H200CW |   |               | 0.83       | 0.93       | V             |
|   | TSD20H100CW | $I_F = 5\text{A}, T_J = 125^\circ\text{C}$  |               | 0.50       | -          | V             |
|   | TSD20H120CW |   |               | 0.53       | -          | V             |
|   | TSD20H150CW |   |               | 0.58       | -          | V             |
|   | TSD20H200CW |   |               | 0.62       | -          | V             |
|   | TSD20H100CW | $I_F = 10\text{A}, T_J = 125^\circ\text{C}$ |               | 0.59       | 0.68       | V             |
|   | TSD20H120CW |   |               | 0.63       | 0.72       | V             |
|   | TSD20H150CW |   |               | 0.66       | 0.75       | V             |
|   | TSD20H200CW |   |               | 0.68       | 0.78       | V             |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup>                              | TSD20H100CW | $T_J = 25^\circ\text{C}$                    | $I_R$         | -          | 200        | $\mu\text{A}$ |
|   | TSD20H120CW |   |               | -          | 100        | $\mu\text{A}$ |
|   | TSD20H150CW |   |               | -          | 25         | mA            |
|   | TSD20H200CW |   |               | -          | 15         | mA            |
|   | TSD20H100CW | $T_J = 125^\circ\text{C}$                   |               | -          | 25         | mA            |
|   | TSD20H120CW |   |               | -          | 15         | mA            |
|   | TSD20H150CW |   |               | -          | 15         | mA            |
|   | TSD20H200CW |   |               | -          | 15         | mA            |

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

| <b>ORDERING INFORMATION</b>        |                               |                   |
|------------------------------------|-------------------------------|-------------------|
| <b>ORDERING CODE<sup>(1)</sup></b> | <b>PACKAGE</b>                | <b>PACKING</b>    |
| TSD20HxCW                          | TO-263AB (D <sup>2</sup> PAK) | 800 / Tape & Reel |

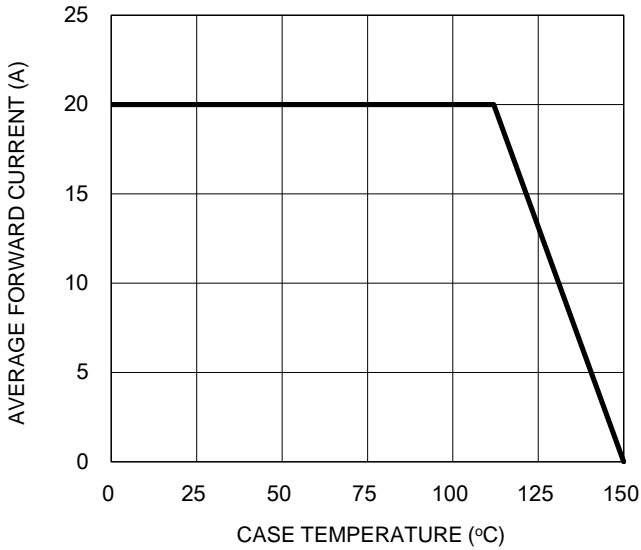
**Notes:**

1. "x" defines voltage from 100V(TSD20H100CW) to 200V(TSD20H200CW)

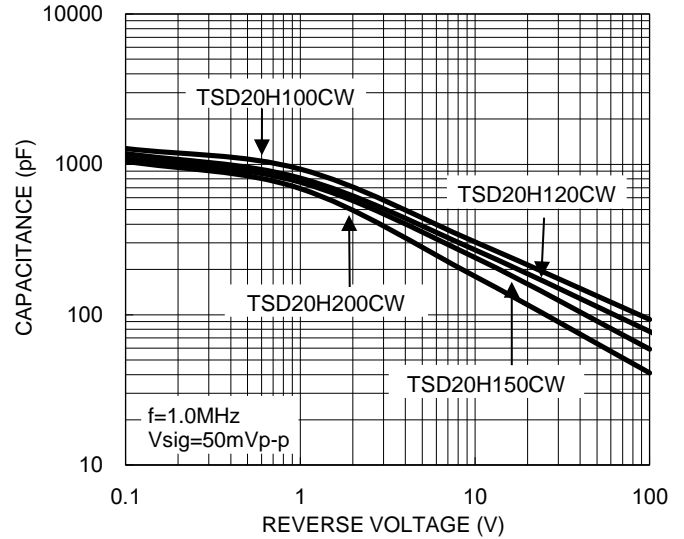
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

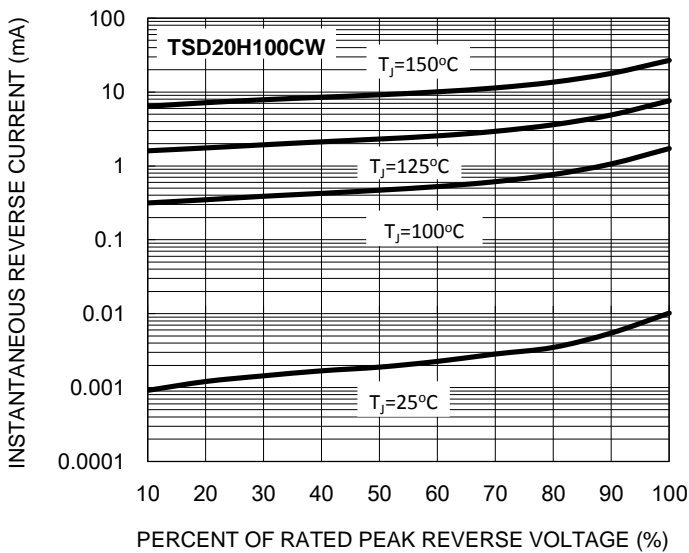
**Fig.1 Forward Current Derating Curve**



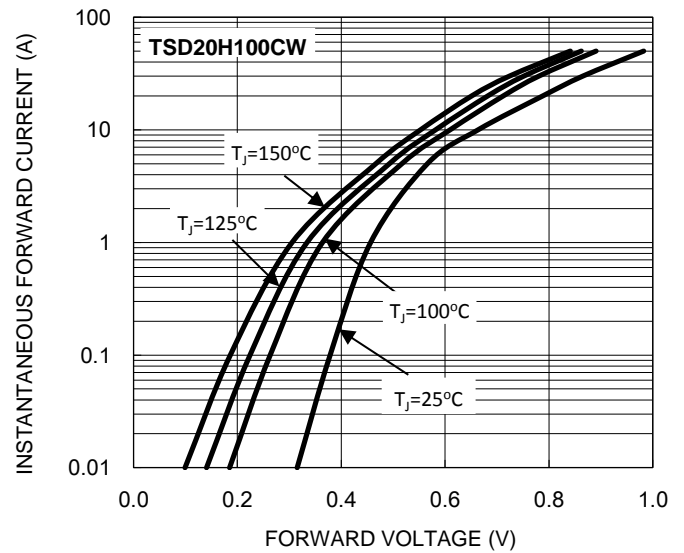
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



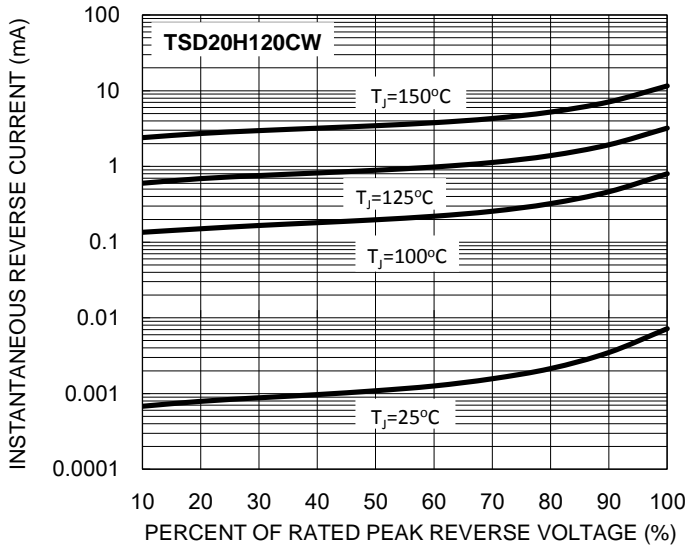
**Fig.4 Typical Forward Characteristics**



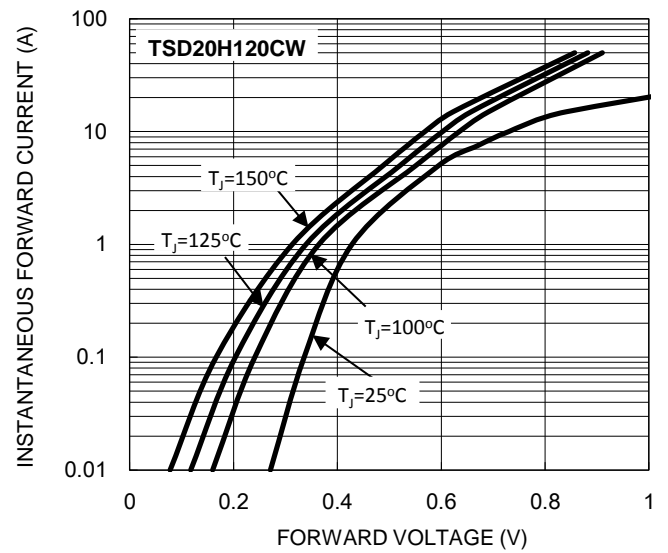
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

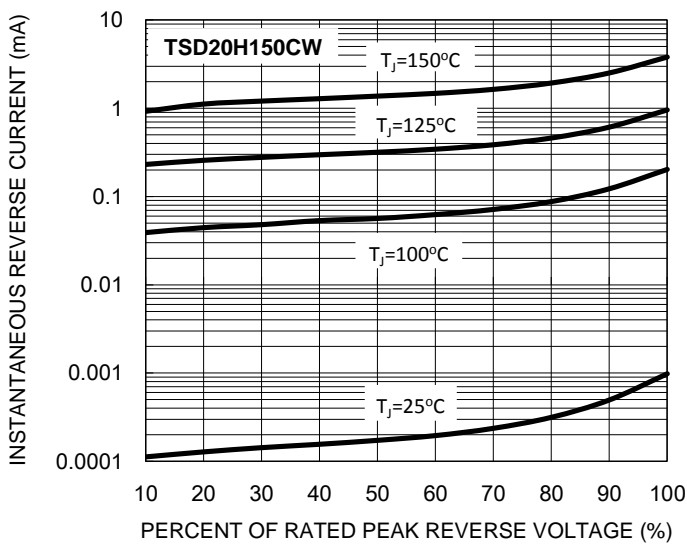
**Fig.5 Typical Reverse Characteristics**



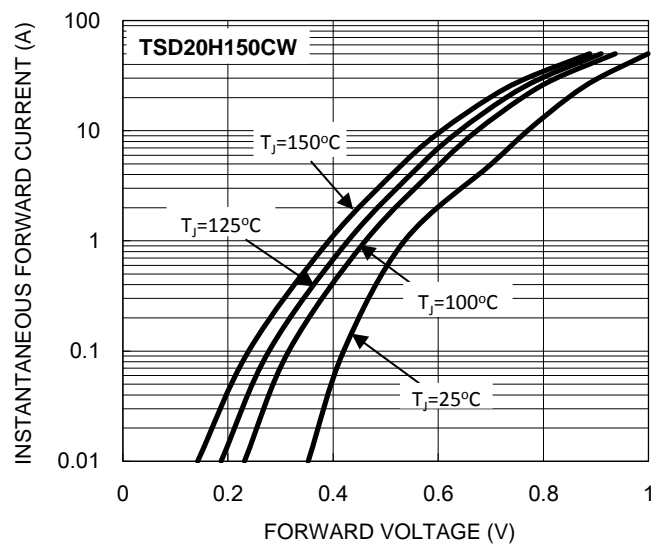
**Fig.6 Typical Forward Characteristics**



**Fig.7 Typical Reverse Characteristics**



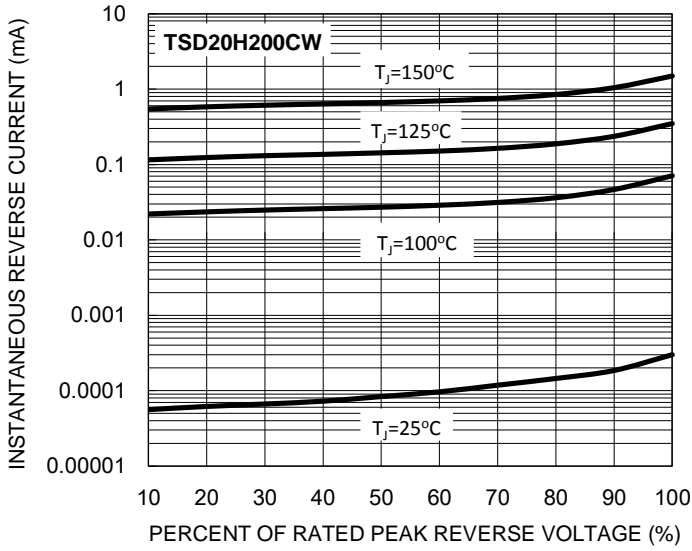
**Fig.8 Typical Forward Characteristics**



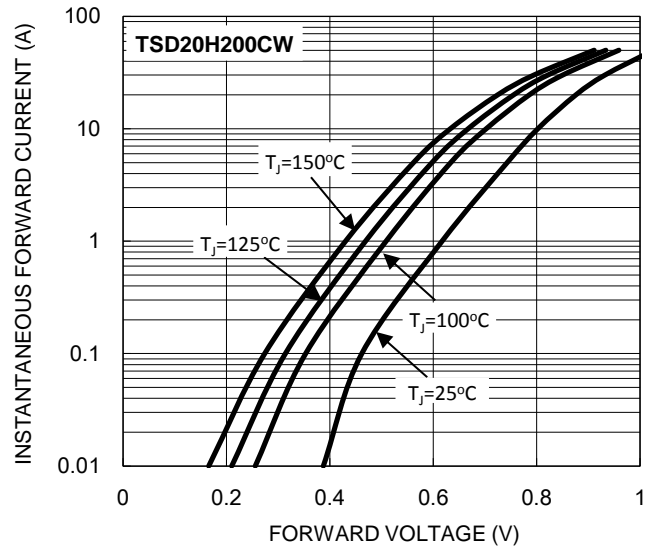
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.9 Typical Reverse Characteristics**

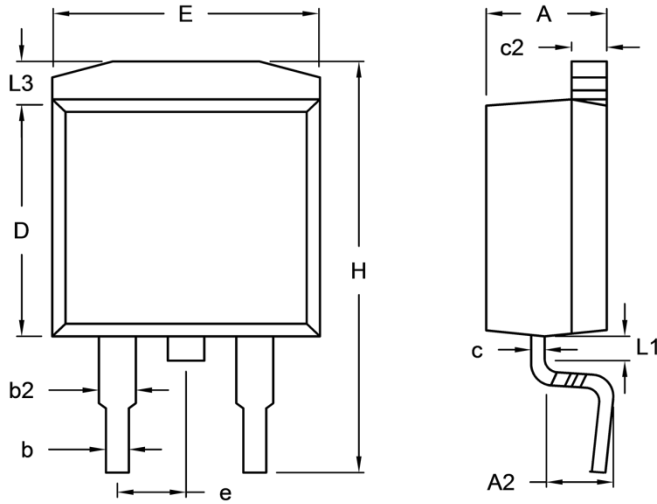


**Fig.10 Typical Forward Characteristics**



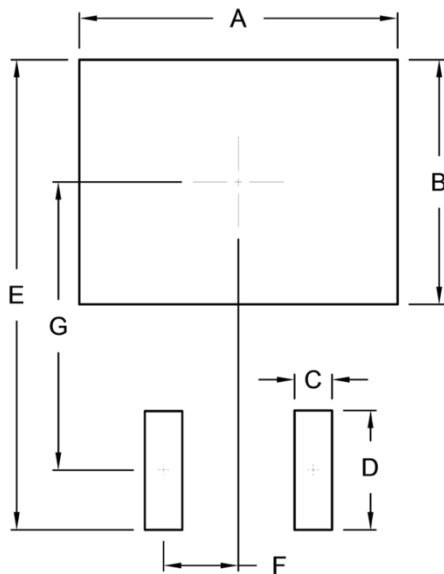
**PACKAGE OUTLINE DIMENSIONS**

TO-263AB (D<sup>2</sup>PAK)



| DIM | Unit (mm)   |        | Unit (inch) |       |
|-----|-------------|--------|-------------|-------|
|     | Min         | Max    | Min         | Max   |
| A   | 4.390       | 4.790  | 0.173       | 0.189 |
| A2  | 2.540 (TYP) |        | 0.100 (TYP) |       |
| b   | 0.675       | 0.975  | 0.027       | 0.038 |
| b2  | 1.150       | 1.550  | 0.045       | 0.061 |
| c   | 0.400       | 0.600  | 0.016       | 0.024 |
| c2  | 1.150       | 1.450  | 0.045       | 0.057 |
| D   | 8.250       | 9.250  | 0.325       | 0.364 |
| E   | 9.600       | 10.050 | 0.378       | 0.396 |
| e   | 2.540 (TYP) |        | 0.100 (TYP) |       |
| H   | 14.920      | 15.520 | 0.587       | 0.611 |
| L1  | 0.900 (TYP) |        | 0.035 (TYP) |       |
| L3  | 1.400 (TYP) |        | 0.055 (TYP) |       |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 10.80     | 0.425       |
| B      | 8.30      | 0.327       |
| C      | 1.27      | 0.050       |
| D      | 4.05      | 0.159       |
| E      | 15.95     | 0.628       |
| F      | 2.54      | 0.100       |
| G      | 9.775     | 0.385       |

**MARKING DIAGRAM**



- P/N = Marking Code
- G = Green Compound
- YWW = Date Code
- F = Factory Code

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