# 25A, 35V - 150V Schottky Barrier Surface Mount Rectifier

## FEATURES

- AEC-Q101 qualified
- Low power loss, high efficiency
- Ideal for automated placement
- Guard ring for overvoltage protection
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

## APPLICATIONS

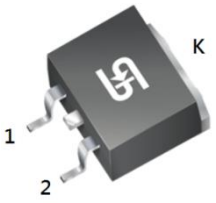
- Low voltage, high freq. inverter
- DC/DC converter
- Freewheeling diodes
- Reverse battery protection
- Car lighting

## MECHANICAL DATA

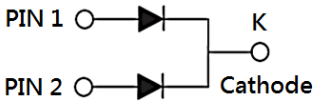
- Case: TO-263AB ($D^2PAK$)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 1.37g (approximately)

| KEY PARAMETERS | | |
|---|---|---|
| **PARAMETER** | **VALUE** | **UNIT** |
| $I_F$ | 25 | A |
| $V_{RRM}$ | 35 - 150 | V |
| $I_{FSM}$ | 200 | A |
| $T_{J\,MAX}$ | 150 | °C |
| Package | TO-263AB ($D^2PAK$) | |
| Configuration | Dual dies | |

Pb-Free RoHS COMPLIANT HALOGEN FREE




**TO-263AB ($D^2PAK$)**




**ABSOLUTE MAXIMUM RATINGS** ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | SYMBOL | MBRS 2535 CTH | MBRS 2545 CTH | MBRS 2550 CTH | MBRS 2560 CTH | MBRS 2590 CTH | MBRS 25100 CTH | MBRS 25150 CTH | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| Marking code on the device | | MBRS 2535CT | MBRS 2545CT | MBRS 2550CT | MBRS 2560CT | MBRS 2590CT | MBRS 25100CT | MBRS 25150CT | |
| Repetitive peak reverse voltage | $V_{RRM}$ | 35 | 45 | 50 | 60 | 90 | 100 | 150 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 24 | 31 | 35 | 42 | 63 | 70 | 105 | V |
| Forward current | $I_F$ | 25 | | | | | | | A |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$ | 200 | | | | | | | A |
| Peak repetitive reverse surge current(1) | $I_{RRM}$ | 1 | | 0.5 | | | | | A |
| Peak repetitive forward current (Rated $V_R$, Square wave, 20KHz) | $I_{FRM}$ | 25 | | | | | | | A |
| Critical rate of rise of off-state voltage | dv/dt | 10,000 | | | | | | | V/μs |

**Notes:**

1. tp = 2.0μs, 1.0KHz

| **ABSOLUTE MAXIMUM RATINGS** ($T_A$ = 25°C unless otherwise noted) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **MBRS 2535 CTH** | **MBRS 2545 CTH** | **MBRS 2550 CTH** | **MBRS 2560 CTH** | **MBRS 2590 CTH** | **MBRS 25100 CTH** | **MBRS 25150 CTH** | **UNIT** |
| Junction temperature | $T_J$ | -55 to +150 | | | | | | | °C |
| Storage temperature | $T_{STG}$ | -55 to +150 | | | | | | | °C |

| **THERMAL PERFORMANCE** | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TYP** | **UNIT** |
| Junction-to-case thermal resistance | $R_{\Theta JC}$ | 1 | °C/W |

| **ELECTRICAL SPECIFICATIONS** ($T_A$ = 25°C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | | **CONDITIONS** | **SYMBOL** | **TYP** | **MAX** | **UNIT** |
| Forward voltage per diode [1] | MBRS2535CTH MBRS2545CTH | $I_F$ = 12.5A, $T_J$ = 25°C | $V_F$ | - | 0.65 | V |
| | MBRS2550CTH MBRS2560CTH | | | - | 0.75 | V |
| | MBRS2590CTH MBRS25100CTH | | | - | 0.85 | V |
| | MBRS25150CTH | | | - | 0.95 | V |
| | MBRS2535CTH MBRS2545CTH | $I_F$ = 25.0A, $T_J$ = 25°C | | - | 0.82 | V |
| | MBRS2550CTH MBRS2560CTH | | | - | 0.90 | V |
| | MBRS2590CTH MBRS25100CTH | | | - | 0.92 | V |
| | MBRS25150CTH | | | - | 1.02 | V |
| | MBRS2535CTH MBRS2545CTH | $I_F$ = 12.5A, $T_J$ = 125°C | | - | 0.55 | V |
| | MBRS2550CTH MBRS2560CTH | | | - | 0.65 | V |
| | MBRS2590CTH MBRS25100CTH | | | - | 0.75 | V |
| | MBRS25150CTH | | | - | 0.92 | V |
| | MBRS2535CTH MBRS2545CTH | $I_F$ = 25.0A, $T_J$ = 125°C | | - | 0.73 | V |
| | MBRS2550CTH MBRS2560CTH | | | - | 0.80 | V |
| | MBRS2590CTH MBRS25100CTH | | | - | 0.88 | V |
| | MBRS25150CTH | | | - | 0.98 | V |

## ELECTRICAL SPECIFICATIONS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Reverse current @ rated $V_R$ per diode (2) | MBRS2535CTH<br>MBRS2545CTH<br>MBRS2550CTH<br>MBRS2560CTH | $T_J$ = 25°C | $I_R$ | - | 200 | μA |
| | MBRS2590CTH<br>MBRS25100CTH<br>MBRS25150CTH | | | - | 100 | μA |
| | MBRS2535CTH<br>MBRS2545CTH | $T_J$ = 125°C | | - | 15 | mA |
| | MBRS2550CTH<br>MBRS2560CTH | | | - | 10 | mA |
| | MBRS2590CTH<br>MBRS25100CTH | | | - | 7.5 | mA |
| | MBRS25150CTH | | | - | 5 | mA |

**Notes:**

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

## ORDERING INFORMATION

| ORDERING CODE(1) | PACKAGE | PACKING |
|---|---|---|
| MBRS25xCTH | TO-263AB ($D^2$PAK) | 800 / Tape & Reel |

**Notes:**

1. "x" defines voltage from 35V(MBRS2535CTH) to 150V(MBRS25150CTH)

## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.1 Forward Current Derating Curve**

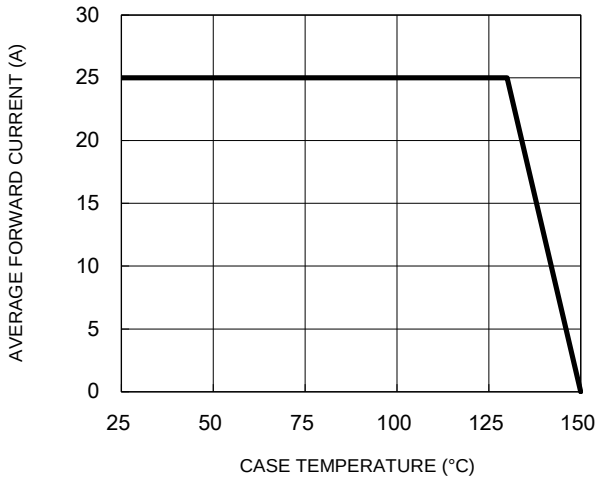



**Fig.2 Typical Junction Capacitance**

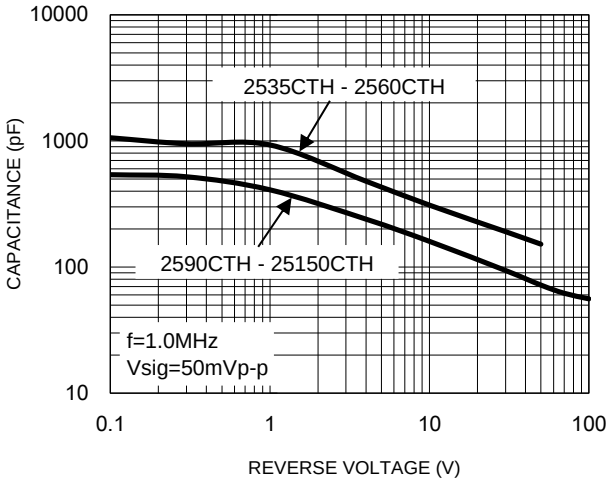



**Fig.3 Typical Reverse Characteristics**

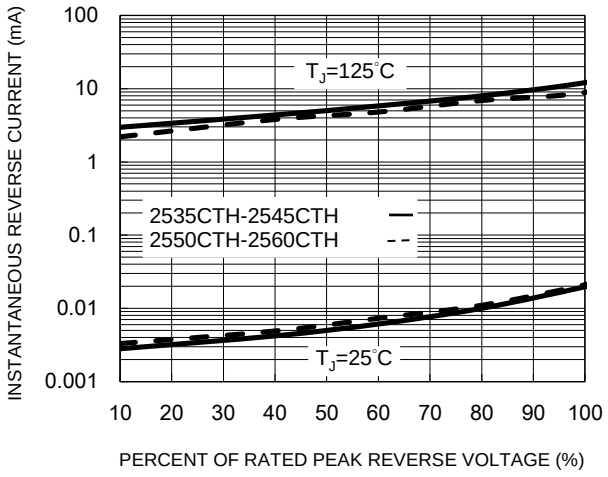



**Fig.4 Typical Forward Characteristics**

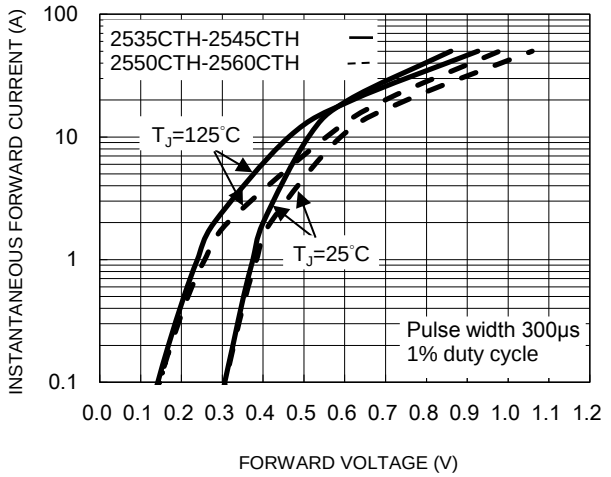



**Fig.5 Typical Reverse Characteristics**

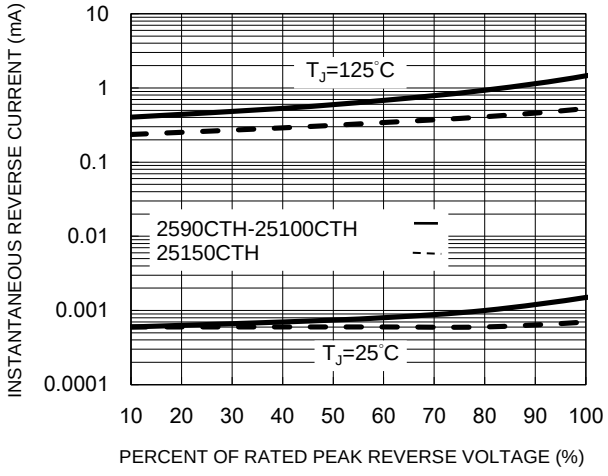
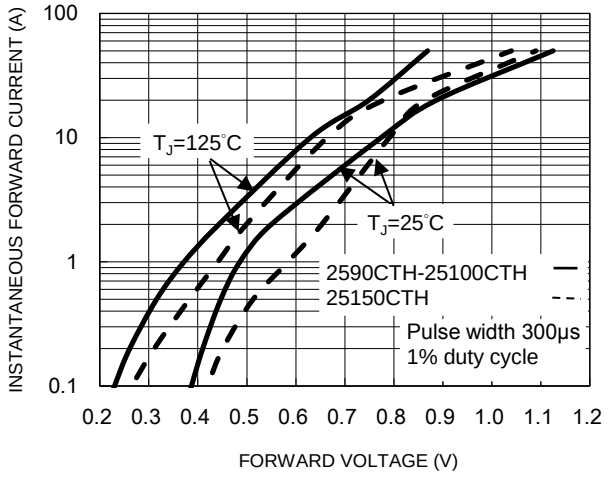



**Fig.6 Typical Forward Characteristics**



## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.7 Maximum Non-Repetitive Forward Surge Current**

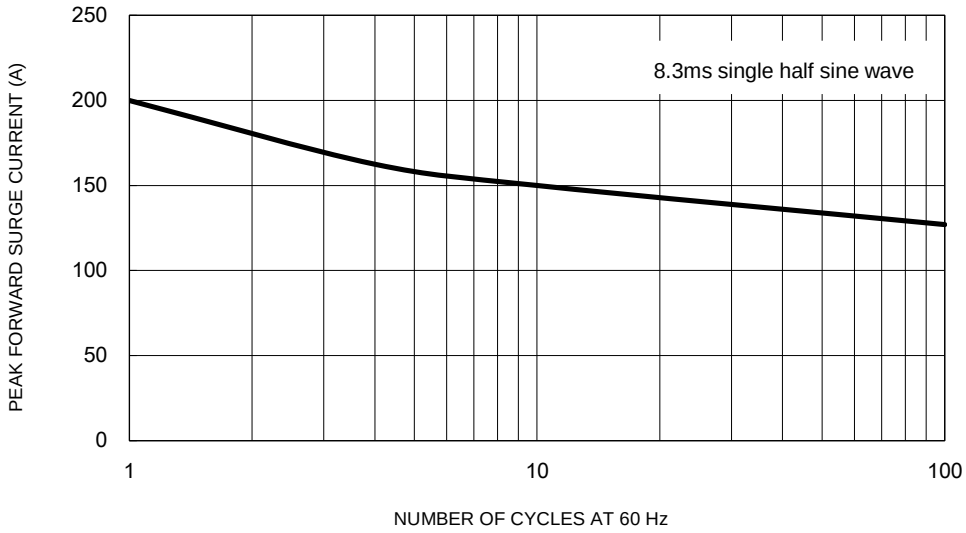
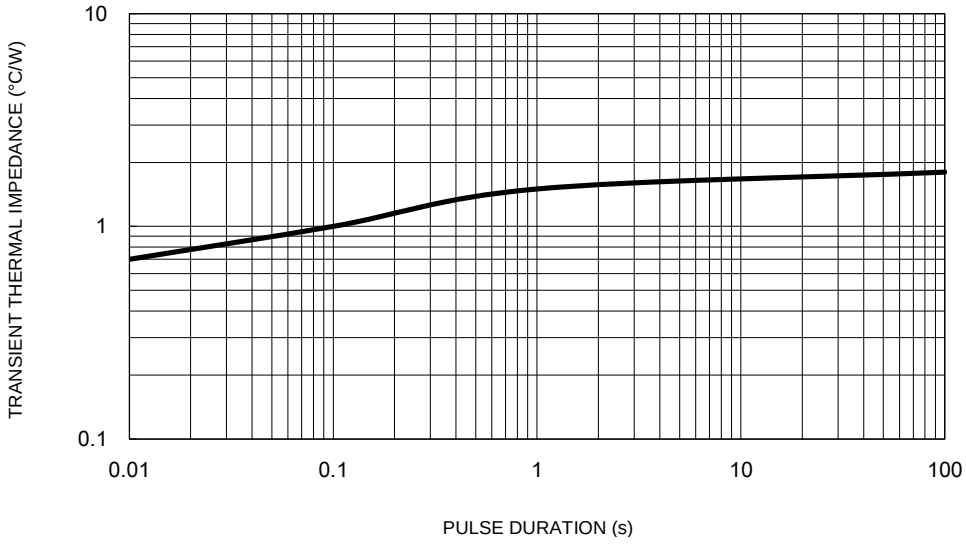
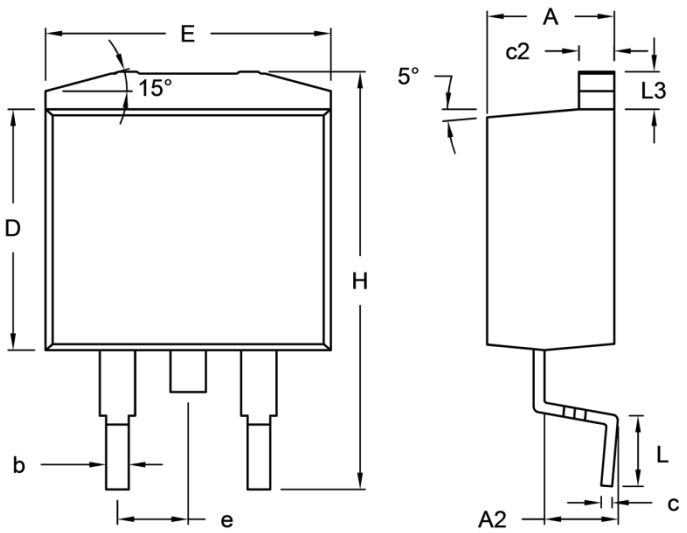



**Fig.8 Typical Transient Thermal Impedance**



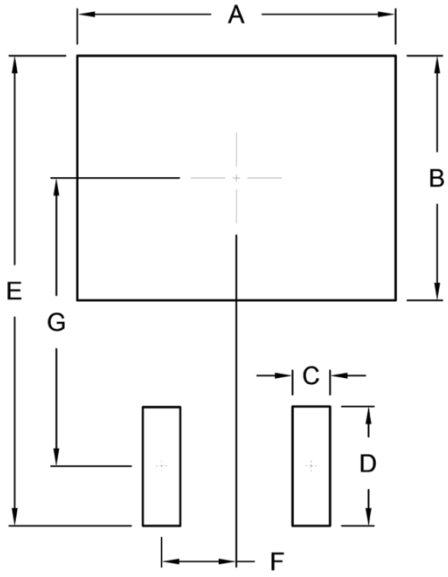
## PACKAGE OUTLINE DIMENSIONS

**TO-263AB ($D^2PAK$)**




| DIM. | Unit (mm) | | Unit (inch) | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 4.44 | 4.70 | 0.175 | 0.185 |
| A2 | 2.03 | 2.79 | 0.080 | 0.110 |
| b | 0.68 | 0.94 | 0.027 | 0.037 |
| c | 0.36 | 0.53 | 0.014 | 0.021 |
| c2 | 1.14 | 1.40 | 0.045 | 0.055 |
| D | 8.25 | 9.25 | 0.325 | 0.364 |
| E | - | 10.50 | - | 0.413 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| H | 14.60 | 15.88 | 0.575 | 0.625 |
| L | 2.29 | 2.79 | 0.090 | 0.110 |
| L3 | 1.14 | 1.40 | 0.045 | 0.055 |

## 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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