

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

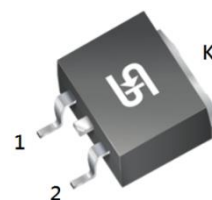
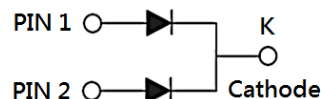
APPLICATIONS

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

MECHANICAL DATA

- Case: TO-263AB (D²PAK)
- 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_{JMAX} | 150 | °C |
| Package | TO-263AB (D ² PAK) | |
| Configuration | Dual dies | |


TO-263AB (D²PAK)


| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | | | |
|--|--------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|------------------|
| PARAMETER | SYMBOL | MBRS | MBRS | MBRS | MBRS | MBRS | MBRS | MBRS | UNIT |
| | | 2535 | 2545 | 2550 | 2560 | 2590 | 25100 | 25150 | |
| | | CTH | CTH | CTH | CTH | CTH | CTH | CTH | |
| 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. $t_p = 2.0\mu\text{s}$, 1.0KHz

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 | | | | | | | $^\circ\text{C}$ |
| Storage temperature | T_{STG} | -55 to +150 | | | | | | | $^\circ\text{C}$ |

| THERMAL PERFORMANCE | | | |
|-------------------------------------|-----------------------|-----|--------------------|
| PARAMETER | SYMBOL | TYP | UNIT |
| Junction-to-case thermal resistance | $R_{\theta\text{JC}}$ | 1 | $^\circ\text{C/W}$ |

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

| ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|--|---------------------------|---------------|------------|------------|---------------|
| PARAMETER | | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
| Reverse current @ rated V_R per diode ⁽²⁾ | MBRS2535CTH MBRS2545CTH MBRS2550CTH MBRS2560CTH | $T_J = 25^\circ\text{C}$ | I_R | - | 200 | μA |
| | MBRS2590CTH MBRS25100CTH MBRS25150CTH | | | - | 100 | μA |
| | MBRS2535CTH MBRS2545CTH | $T_J = 125^\circ\text{C}$ | | - | 15 | mA |
| | MBRS2550CTH MBRS2560CTH | | | - | 10 | mA |
| | MBRS2590CTH MBRS25100CTH | | | - | 7.5 | mA |
| | MBRS25150CTH | | | - | 5 | mA |

Notes:

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

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

Notes:

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

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

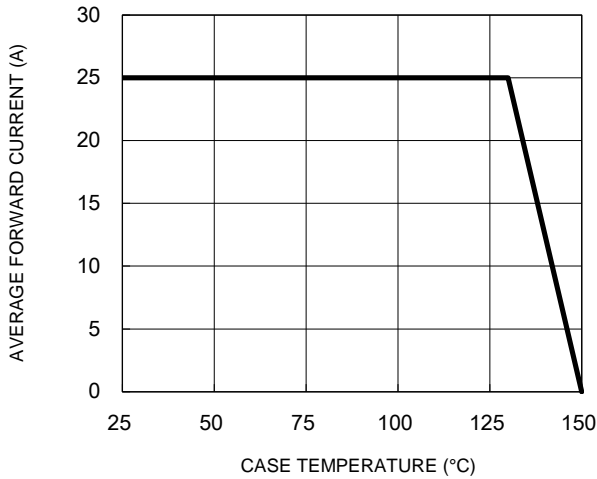


Fig.2 Typical Junction Capacitance

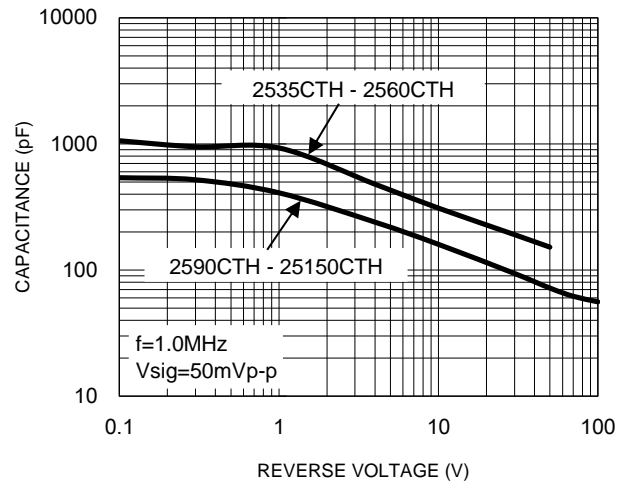


Fig.3 Typical Reverse Characteristics

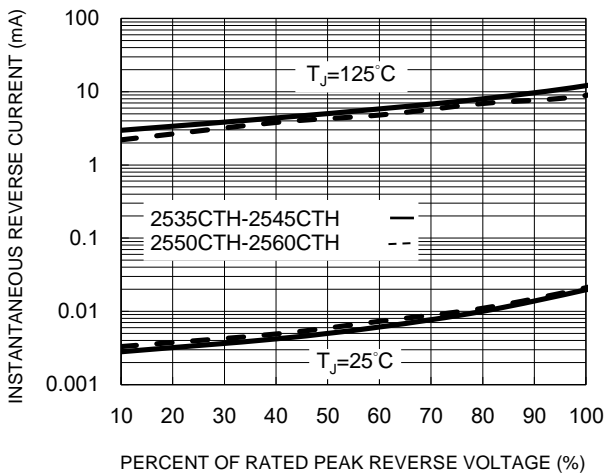


Fig.4 Typical Forward Characteristics

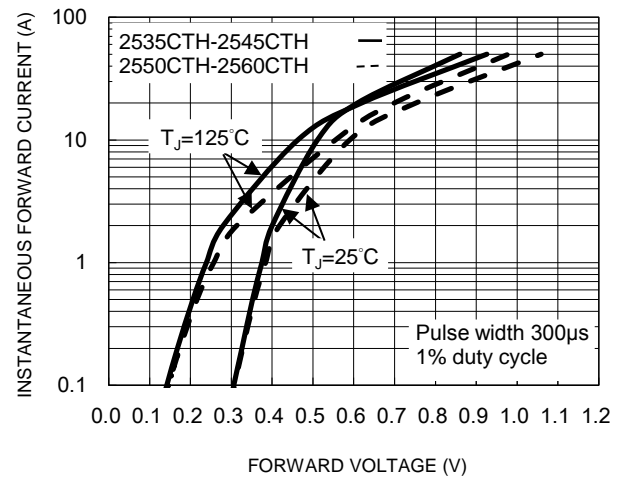


Fig.5 Typical Reverse Characteristics

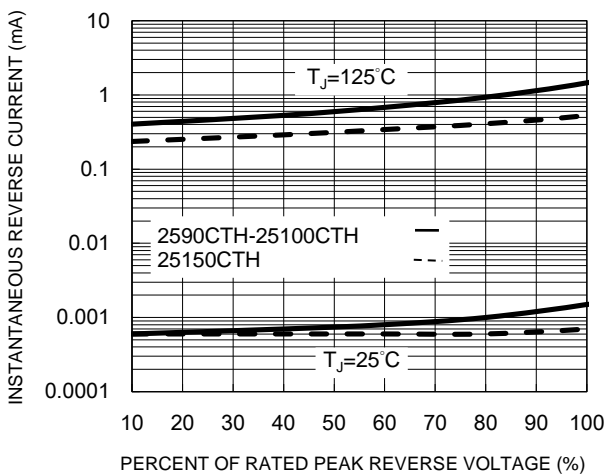
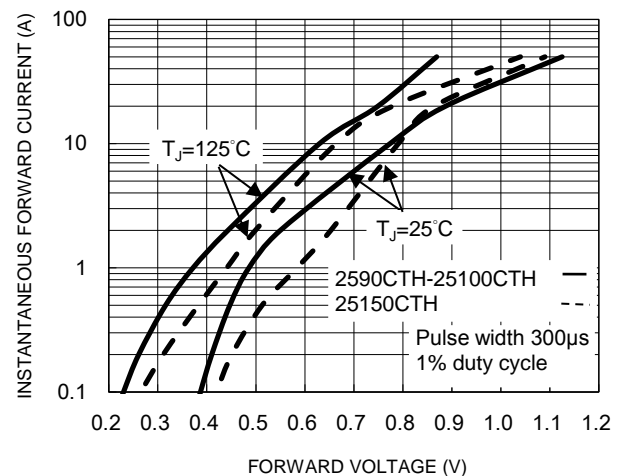


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Maximum Non-Repetitive Forward Surge Current

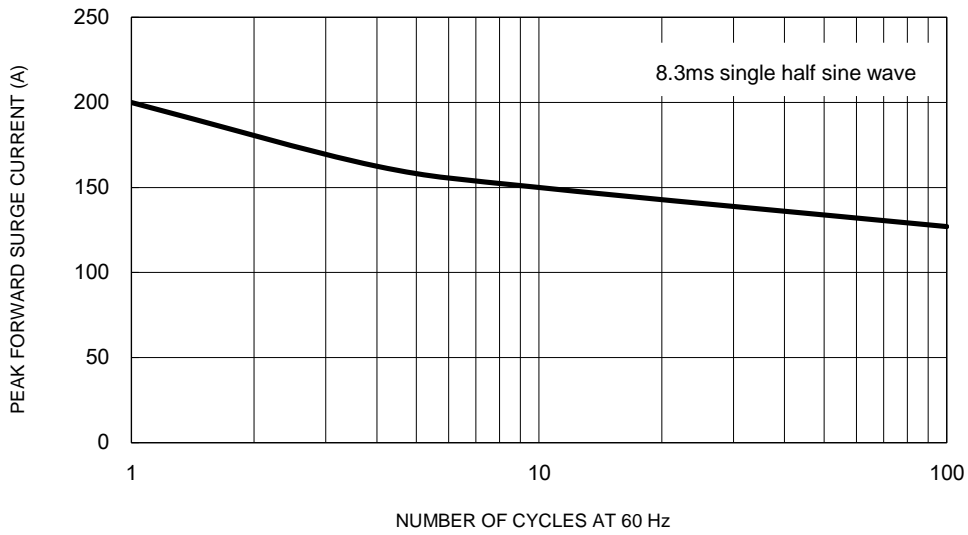
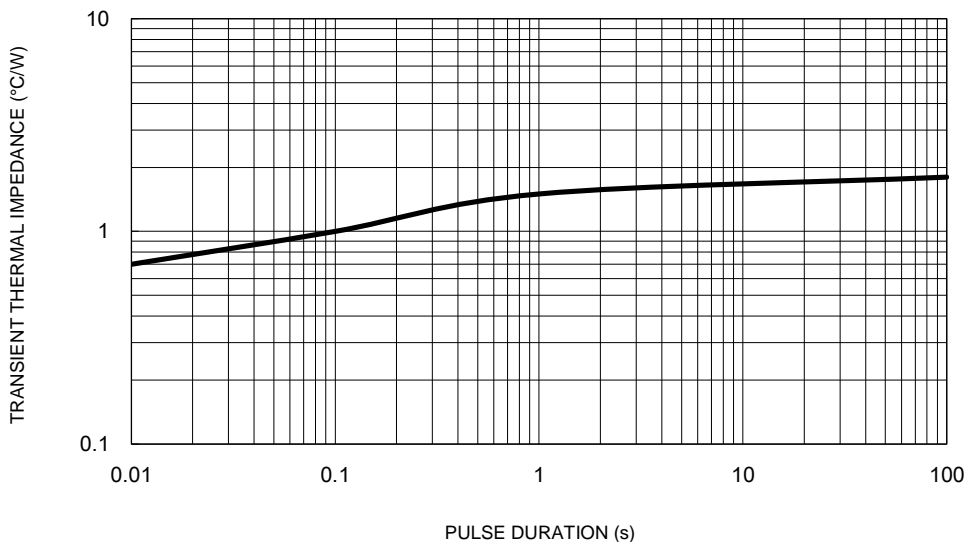
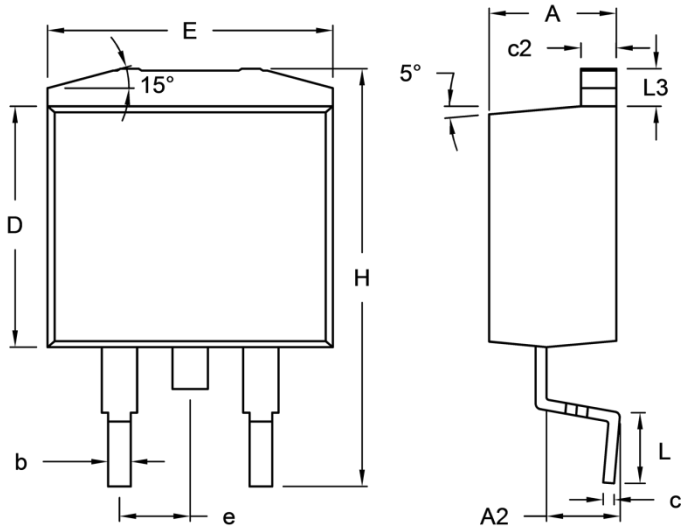


Fig.8 Typical Transient Thermal Impedance



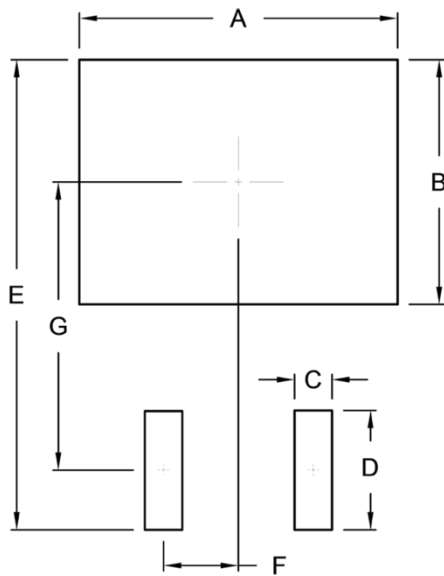
PACKAGE OUTLINE DIMENSIONS

TO-263AB (D²PAK)



| 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