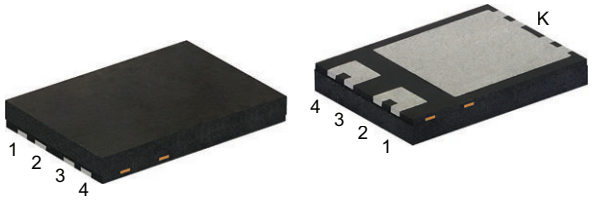
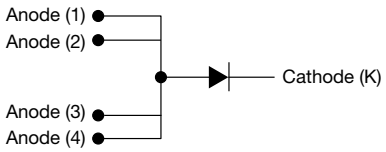
# High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F$ = 0.37 V at $I_F$ = 5 A




**DFN6546A**




## LINKS TO ADDITIONAL RESOURCES

Application Notes | Marking | Packages

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 15 A |
| $V_{RRM}$ | 100 V |
| $I_{FSM}$ | 240 A |
| $V_F$ at $I_F$ = 15 A ($T_J$ = 125 °C) | 0.54 V |
| $T_J$ max. | 150 °C |
| Package | DFN6546A |
| Circuit configuration | Single |

## FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

- Low profile package - typical height of 0.88 mm
- Leadless DFN package with side-wettable flanks suitable for customer AOI (Automatic Optical Inspection)
- Very low forward voltage by TMBS Gen3 technology
- Low power losses, high efficiency
- Compatible to SMPC (TO-277A) package case outline
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

## MECHANICAL DATA

**Case:** DFN6546A
Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

| **MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **V15N6103** | **UNIT** |
| Device marking code | | 1513 | |
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 100 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ (1) | 15 | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 240 | A |
| Operating junction temperature range | $T_J$ (2) | -40 to +150 | °C |
| Storage temperature range | $T_{STG}$ | -55 to +150 | °C |

**Notes**

(1) With infinite heatsink

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

| ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F$ = 5 A | $T_J$ = 25 °C | $V_F$ (1) | 0.46 | - | V |
| | $I_F$ = 7.5 A | | | 0.50 | - | |
| | $I_F$ = 15 A | | | 0.59 | 0.66 | |
| | $I_F$ = 5 A | $T_J$ = 125 °C | | 0.37 | - | |
| | $I_F$ = 7.5 A | | | 0.42 | - | |
| | $I_F$ = 15 A | | | 0.54 | 0.59 | |
| Reverse current | $I_R$ at 70 V | $T_J$ = 25 °C | $I_R$ (2) | 0.02 | - | mA |
| | | $T_J$ = 125 °C | | 9 | - | |
| | $V_R$ = 100 V | $T_J$ = 25 °C | | - | 1 | mA |
| | | $T_J$ = 125 °C | | 23 | 70 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 1900 | - | pF |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| PARAMETER | SYMBOL | TYP. | MAX. | UNIT |
| Thermal resistance | $R_{\theta JM}$ (1) | 2 | 2.5 | °C/W |

**Note**

(1) Thermal resistance junction to mount follows JEDEC® 51-14 transient dual interface test method (TDIM)

## ORDERING INFORMATION TABLE

**Device code**

| V | 15 | N6 | 10 | 3 | H | M3 |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1 - Vishay TMBS product

2 - Current rating (15 = 15 A)

3 - Package type (N6 = DFN6546A package)

4 - Voltage rating (10 = 100 V)

5 - TMBS generation option (3 = Gen 3)

6 - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)

7 - Material / environmental category
(M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)

| ORDERING INFORMATION (Example) | | | | |
|---|---|---|---|---|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V15N6103-M3/I | 0.086 | I | 6000 | 13" diameter plastic tape and reel |
| V15N6103HM3/I (1) | 0.086 | I | 6000 | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

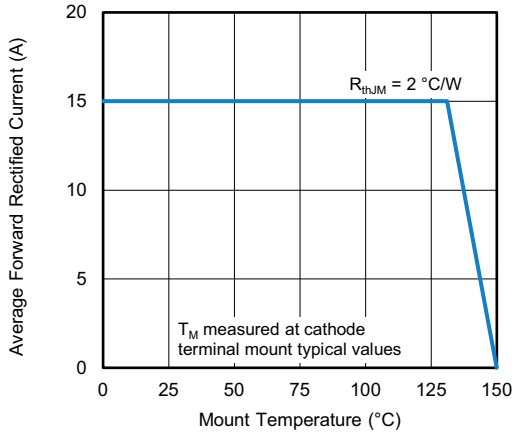



Fig. 1 - Forward Current Derating Curve

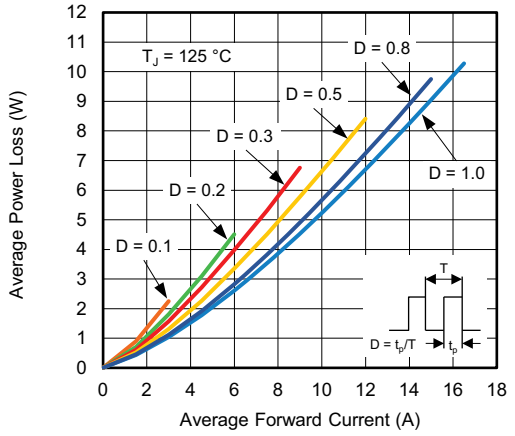



Fig. 2 - Forward Power Loss Characteristics

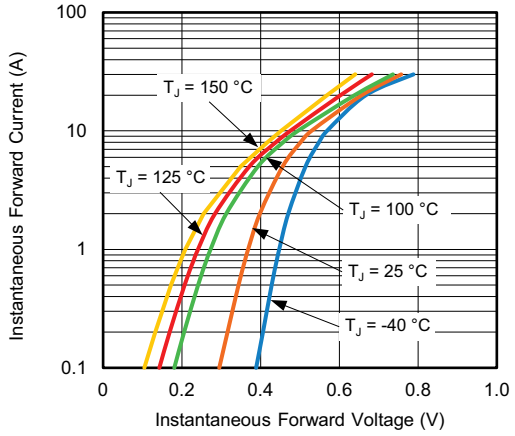



Fig. 3 - Typical Instantaneous Forward Characteristics

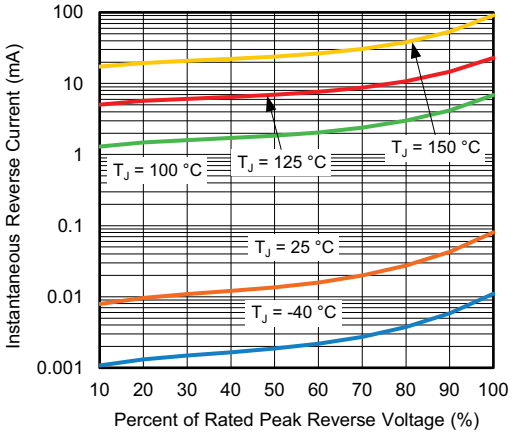



Fig. 4 - Typical Reverse Leakage Characteristics

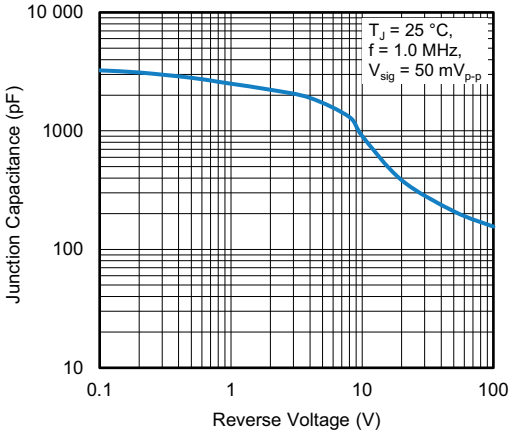



Fig. 5 - Typical Junction Capacitance

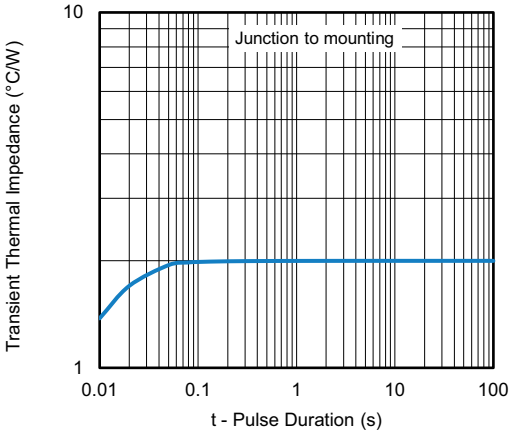
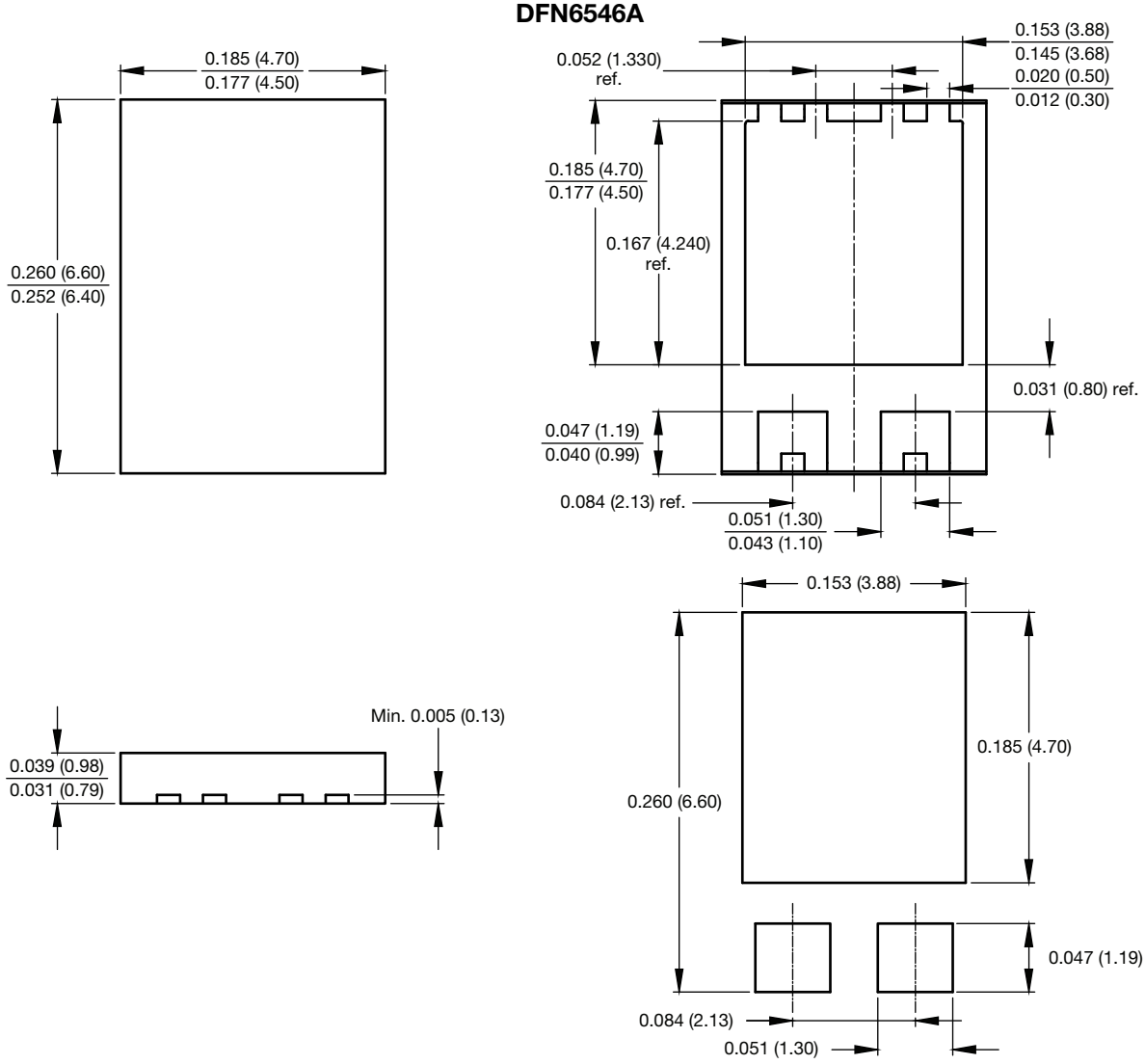



Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DFN6546A**



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