

**ABSOLUTE MAXIMUM RATINGS**

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--|-------------|---|--------|-------|
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 123\text{ }^{\circ}\text{C}$, rectangular waveform | 15 | A |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 810 | A |
| | | 10 ms sine or 6 ms rect. pulse | 145 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 1.20\text{ A}$, $L = 11.10\text{ mH}$ | 10 | mJ |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | 1.5 | A |

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|----------------|--|--------|------------------|
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 7.5 A | 0.55 | V |
| | | 15 A | 0.70 | |
| | | 7.5 A | 0.51 | |
| | | 15 A | 0.65 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.8 | mA |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | 32 | |
| Maximum junction capacitance per leg | C_T | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$ | 400 | pF |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | 8.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated V_R | 10 000 | V/ μs |

Note(1) Pulse width < 300 μs , duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--|-----------------------------------|--------------------------------------|-------------|------------------------|
| Maximum junction and storage temperature range | T _J , T _{Stg} | | -55 to +150 | °C |
| Maximum thermal resistance, junction to case per leg | R _{thJC} | DC operation See fig. 4 | 3.50 | °C/W |
| Maximum thermal resistance, junction to case per package | | DC operation | 1.75 | |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth and greased | 0.50 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Mounting torque | minimum | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | 12 (10) | |
| Marking device | | Case style D ² PAK | 15CTQ045S | |
| | | Case style TO-262 | 15CTQ045-1 | |

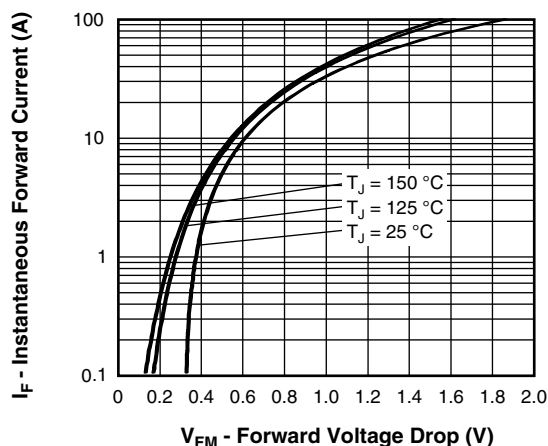


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

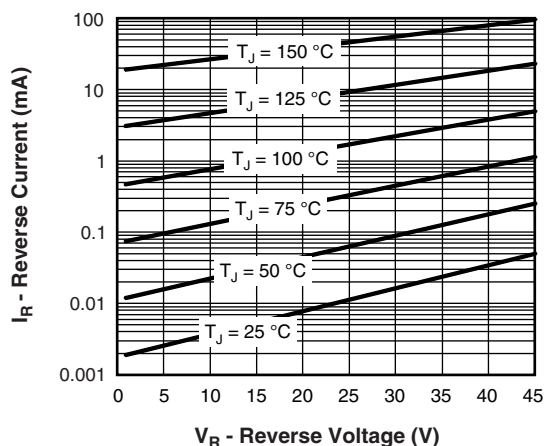


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

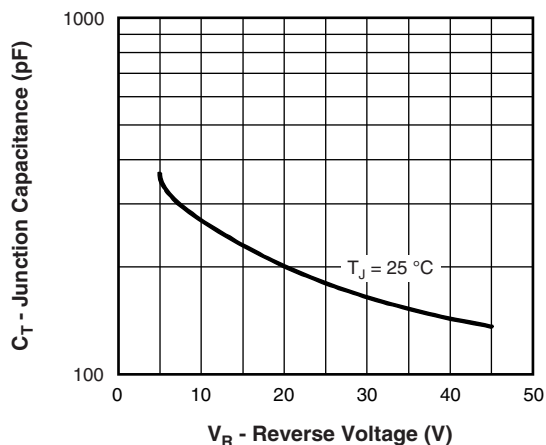


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

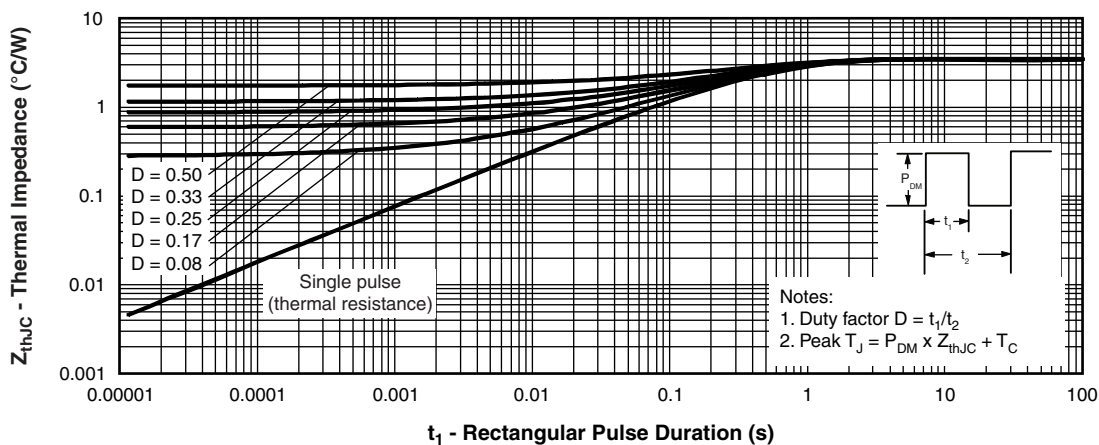


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

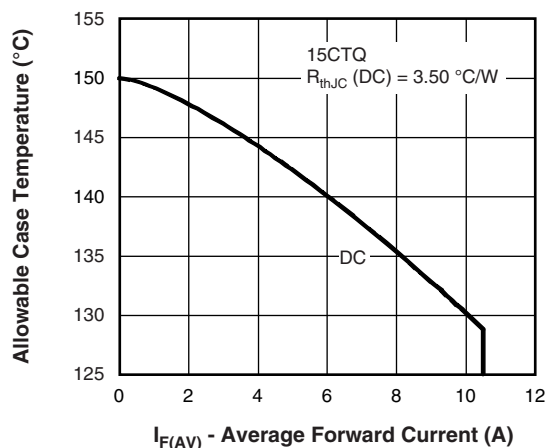


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

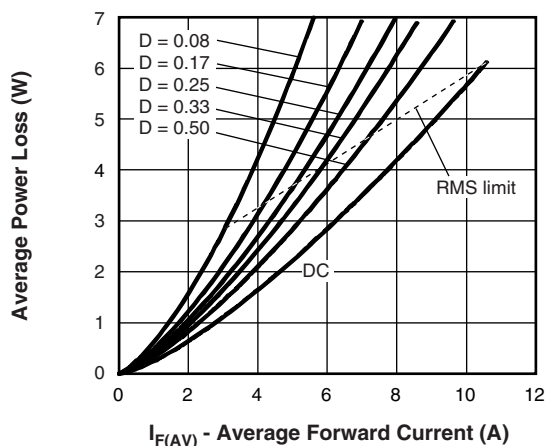


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

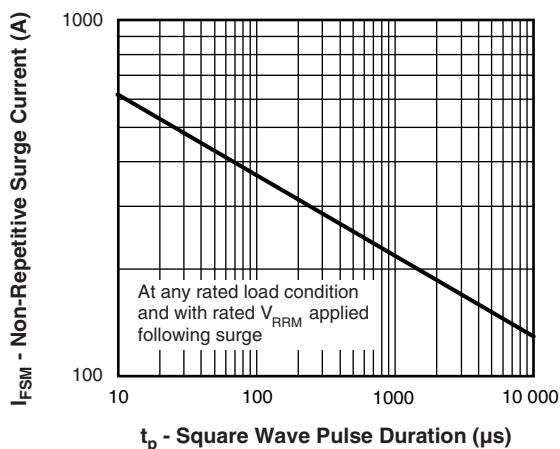


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

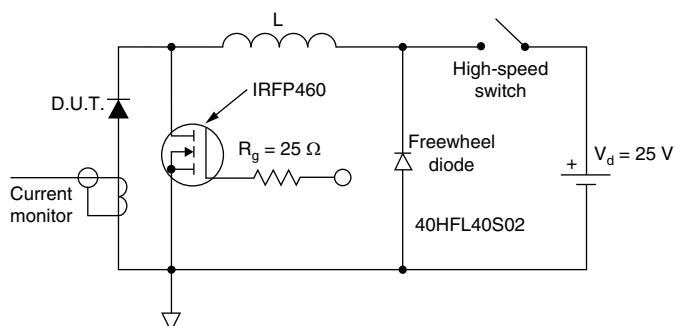


Fig. 8 - Unclamped Inductive Test Circuit



ORDERING INFORMATION TABLE

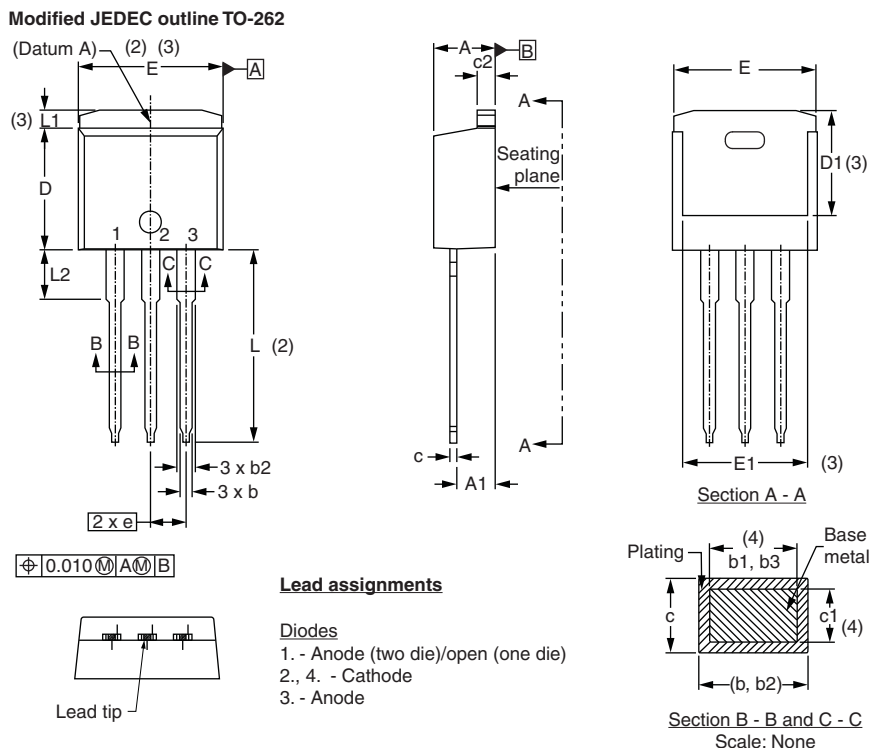
| | | | | | | | | | |
|-------------|-----|----|---|---|---|-----|---|-----|-----|
| Device code | VS- | 15 | C | T | Q | 045 | S | TRL | PbF |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

- | | | | |
|----------|---|--|------------|
| 1 | - | Vishay Semiconductors product | |
| 2 | - | Current rating (15 A) | |
| 3 | - | Circuit configuration: C = common cathode | |
| 4 | - | T = TO-220 | |
| 5 | - | Schottky "Q" series | 035 = 35 V |
| 6 | - | Voltage ratings | 040 = 40 V |
| 7 | - | • S = D ² PAK | 045 = 45 V |
| | | • -1 = TO-262 | |
| 8 | - | • None = tube (50 pieces) | |
| | | • TRL = tape and reel (left oriented - for D ² PAK only) | |
| | | • TRR = tape and reel (right oriented - for D ² PAK only) | |
| 9 | - | PbF = lead (Pb)-free | |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95014 |
| Part marking information | www.vishay.com/doc?95008 |
| Packaging information | www.vishay.com/doc?95032 |

Downloaded from Arrow.com.

DIMENSIONS - TO-262 in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | |
| A1 | 2.03 | 3.02 | 0.080 | 0.119 | |
| b | 0.51 | 0.99 | 0.020 | 0.039 | |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.38 | 0.74 | 0.015 | 0.029 | |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| L | 13.46 | 14.10 | 0.530 | 0.555 | |
| L1 | - | 1.65 | - | 0.065 | 3 |
| L2 | 3.56 | 3.71 | 0.140 | 0.146 | |

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Controlling dimension: inches

- (6) Outline conform to JEDEC TO-262 except A1 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline



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