

**ELECTRICAL SPECIFICATIONS**

| PARAMETER                                             | SYMBOL         | TEST CONDITIONS                                                                           |                                     | TYP. | MAX.   | UNITS            |
|-------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------|-------------------------------------|------|--------|------------------|
| Maximum forward voltage drop per leg<br>See fig. 1    | $V_{FM}^{(1)}$ | 40 A                                                                                      | $T_J = 25\text{ }^{\circ}\text{C}$  | 0.82 | 0.86   | V                |
|                                                       |                | 80 A                                                                                      |                                     | 0.97 | 1.09   |                  |
|                                                       |                | 40 A                                                                                      | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.67 | 0.71   |                  |
|                                                       |                | 80 A                                                                                      |                                     | 0.80 | 0.85   |                  |
| Maximum reverse leakage current per leg<br>See fig. 2 | $I_{RM}$       | $T_J = 25\text{ }^{\circ}\text{C}$                                                        | $V_R = \text{Rated } V_R$           | 10   | 200    | $\mu\text{A}$    |
|                                                       |                | $T_J = 125\text{ }^{\circ}\text{C}$                                                       |                                     | 12   | 26     | mA               |
| Typical junction capacitance per leg                  | $C_T$          | $V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ |                                     | -    | 1100   | pF               |
| Typical series inductance per leg                     | $L_S$          | Measured lead to lead 5 mm from package body                                              |                                     | -    | 7.5    | nH               |
| Maximum voltage rate of change                        | dV/dt          | Rated $V_R$                                                                               |                                     | -    | 10 000 | V/ $\mu\text{s}$ |

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

| PARAMETER                                                | SYMBOL                            | TEST CONDITIONS                      | VALUES      | UNITS                  |
|----------------------------------------------------------|-----------------------------------|--------------------------------------|-------------|------------------------|
| Maximum junction and storage temperature range           | T <sub>J</sub> , T <sub>Stg</sub> |                                      | - 55 to 175 | °C                     |
| Maximum thermal resistance, junction to case per leg     | R <sub>thJC</sub>                 | DC operation<br>See fig. 4           | 0.6         | °C/W                   |
| Maximum thermal resistance, junction to case per package |                                   | DC operation                         | 0.3         |                        |
| Typical thermal resistance, case to heatsink             | R <sub>thCS</sub>                 | Mounting surface, smooth and greased | 0.24        |                        |
| Approximate weight                                       |                                   |                                      | 6           | g                      |
|                                                          |                                   |                                      | 0.21        | oz.                    |
| Mounting torque                                          |                                   |                                      | 6 (5)       | kgf · cm<br>(lbf · in) |
|                                                          |                                   |                                      | 12 (10)     |                        |
| Marking device                                           |                                   | Case style TO-247AC (JEDEC)          | 80CPQ150    |                        |

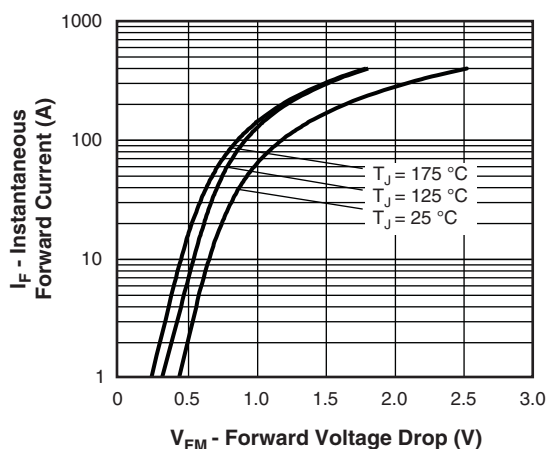


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

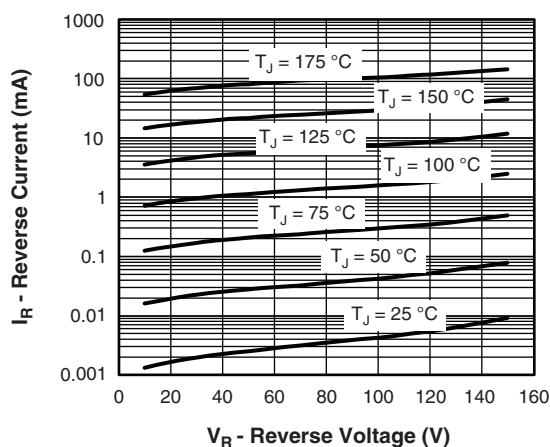


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

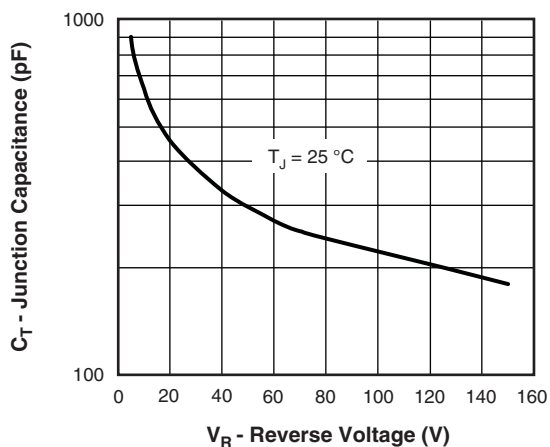


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

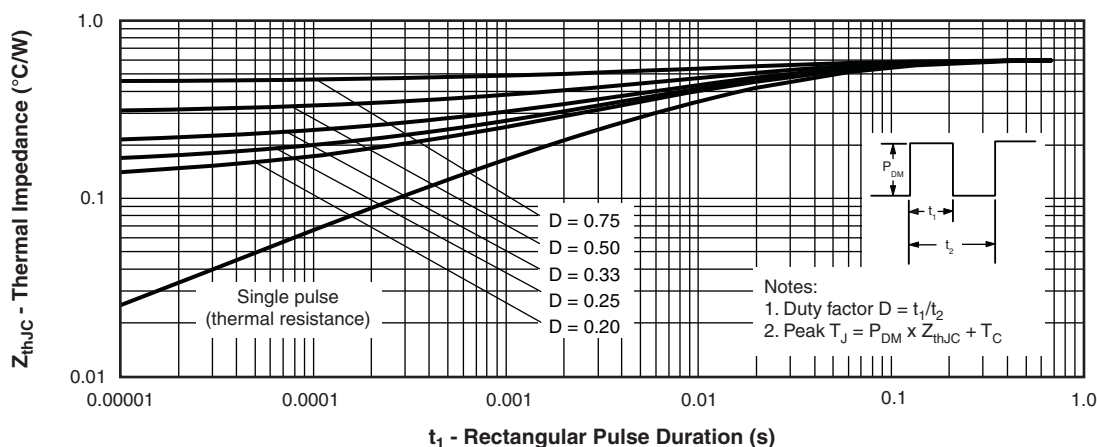


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

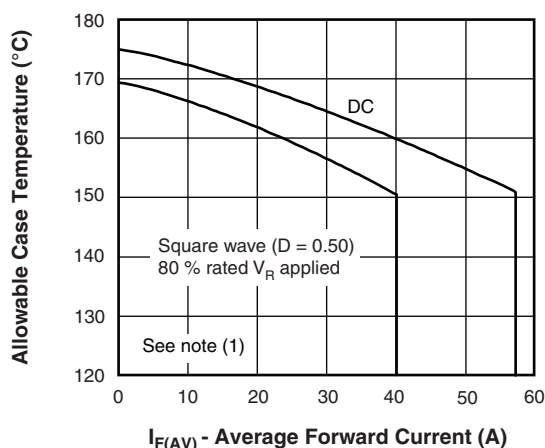


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

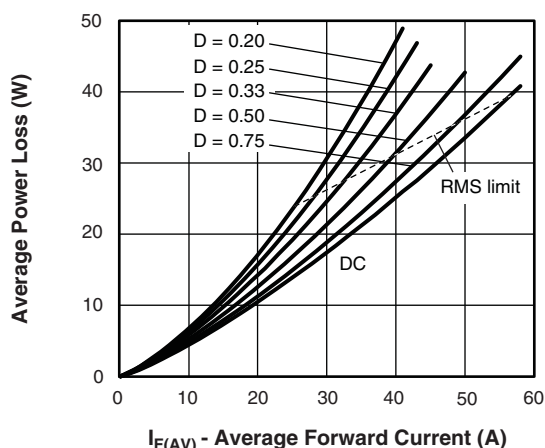


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

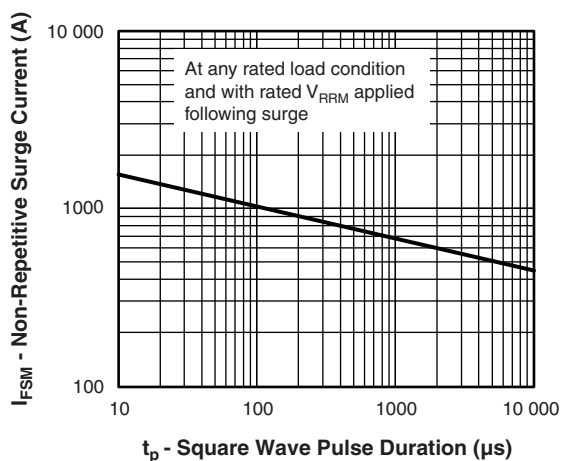


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

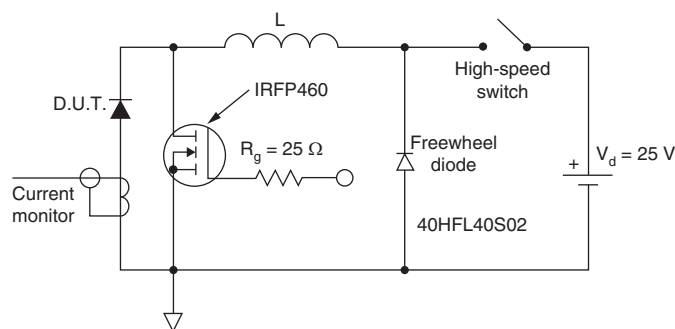


Fig. 8 - Unclamped Inductive Test Circuit

#### Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  
 $P_{dREV}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$

**ORDERING INFORMATION TABLE**

|             |            |           |          |          |          |            |            |
|-------------|------------|-----------|----------|----------|----------|------------|------------|
| Device code | <b>VS-</b> | <b>80</b> | <b>C</b> | <b>P</b> | <b>Q</b> | <b>150</b> | <b>PbF</b> |
|             | ①          | ②         | ③        | ④        | ⑤        | ⑥          | ⑦          |

- |          |                                                |
|----------|------------------------------------------------|
| <b>1</b> | - Vishay Semiconductors product                |
| <b>2</b> | - Current rating (80 = 80 A)                   |
| <b>3</b> | - Circuit configuration:<br>C = Common cathode |
| <b>4</b> | - Package:<br>P = TO-247                       |
| <b>5</b> | - Schottky "Q" series                          |
| <b>6</b> | - Voltage code (150 = 150 V)                   |
| <b>7</b> | - Environmental digit                          |
- PbF = Lead (Pb)-free and RoHS compliant
  - -N3 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

**ORDERING INFORMATION** (Example)

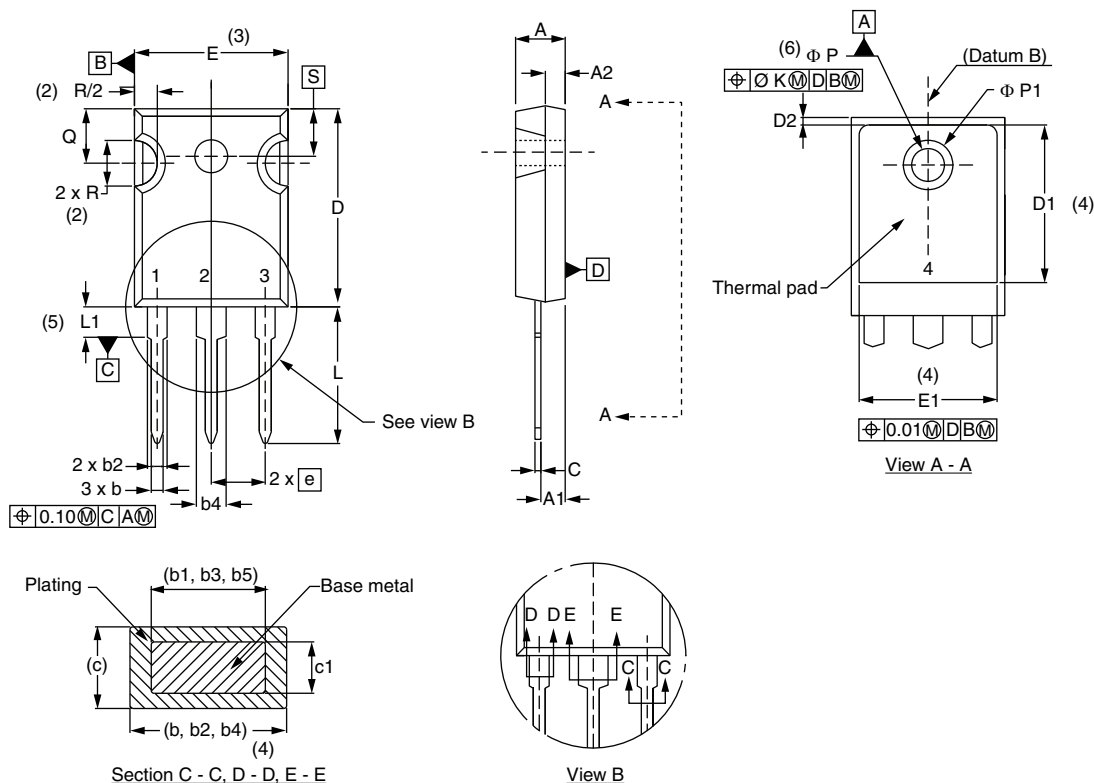
| PREFERRED P/N  | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION   |
|----------------|------------------|------------------------|-------------------------|
| VS-80CPQ150PbF | 25               | 500                    | Antistatic plastic tube |
| VS-80CPQ150-N3 | 25               | 500                    | Antistatic plastic tube |

**LINKS TO RELATED DOCUMENTS**

|                          |              |                                                                        |
|--------------------------|--------------|------------------------------------------------------------------------|
| Dimensions               |              | <a href="http://www.vishay.com/doc?95542">www.vishay.com/doc?95542</a> |
| Part marking information | TO-247AC PbF | <a href="http://www.vishay.com/doc?95226">www.vishay.com/doc?95226</a> |
|                          | TO-247AC -N3 | <a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a> |

## TO-247AC - 50 mils L/F

**DIMENSIONS** in millimeters and inches



| SYMBOL | MILLIMETERS |       | INCHES |       | NOTES |
|--------|-------------|-------|--------|-------|-------|
|        | MIN.        | MAX.  | MIN.   | MAX.  |       |
| A      | 4.65        | 5.31  | 0.183  | 0.209 |       |
| A1     | 2.21        | 2.59  | 0.087  | 0.102 |       |
| A2     | 1.17        | 1.37  | 0.046  | 0.054 |       |
| b      | 0.99        | 1.40  | 0.039  | 0.055 |       |
| b1     | 0.99        | 1.35  | 0.039  | 0.053 |       |
| b2     | 1.65        | 2.39  | 0.065  | 0.094 |       |
| b3     | 1.65        | 2.34  | 0.065  | 0.092 |       |
| b4     | 2.59        | 3.43  | 0.102  | 0.135 |       |
| b5     | 2.59        | 3.38  | 0.102  | 0.133 |       |
| c      | 0.38        | 0.89  | 0.015  | 0.035 |       |
| c1     | 0.38        | 0.84  | 0.015  | 0.033 |       |
| D      | 19.71       | 20.70 | 0.776  | 0.815 | 3     |
| D1     | 13.08       | -     | 0.515  | -     | 4     |

| SYMBOL    | MILLIMETERS |       | INCHES    |       | NOTES |
|-----------|-------------|-------|-----------|-------|-------|
|           | MIN.        | MAX.  | MIN.      | MAX.  |       |
| D2        | 0.51        | 1.35  | 0.020     | 0.053 |       |
| E         | 15.29       | 15.87 | 0.602     | 0.625 | 3     |
| E1        | 13.46       | -     | 0.53      | -     |       |
| e         | 5.46 BSC    |       | 0.215 BSC |       |       |
| $\Phi K$  | 0.254       |       | 0.010     |       |       |
| L         | 14.20       | 16.10 | 0.559     | 0.634 |       |
| L1        | 3.71        | 4.29  | 0.146     | 0.169 |       |
| $\Phi P$  | 3.56        | 3.66  | 0.14      | 0.144 |       |
| $\Phi P1$ | -           | 7.39  | -         | 0.291 |       |
| Q         | 5.31        | 5.69  | 0.209     | 0.224 |       |
| R         | 4.52        | 5.49  | 0.178     | 0.216 |       |
| S         | 5.51 BSC    |       | 0.217 BSC |       |       |

### Notes

- Dimensioning and tolerancing per ASME Y14.5M-1994
- Contour of slot optional
- 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 outermost extremes of the plastic body
- Thermal pad contour optional with dimensions D1 and E1
- Lead finish uncontrolled in L1
- $\Phi P$  to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- Outline conforms to JEDEC® outline TO-247 with exception of dimension c and Q



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