


Ultrafast Diodes, 300 A (INT-A-PAK Power Modules)


INT-A-PAK
FEATURES

- Electrically insulated by DBC ceramic
- 3500 V_{RMS} isolating voltage
- Standard JEDEC® package
- Simplified mechanical designs, rapid assembly
- High surge capability
- Large creepage distances
- UL approved file E78996 
- Case style INT-A-PAK
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**
PRODUCT SUMMARY

| | |
|----------------------|-------------------------------|
| $I_{F(AV)}$ at T_C | 300 A at 48 °C |
| Type | Modules - Diode, High Voltage |
| Package | INT-A-PAK |
| Circuit | Two diodes doubler circuit |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--|----------------|---|------------|-------|
| Cathode to anode voltage | V_R | | 600 | V |
| Continuous forward current per leg | I_F | $T_C = 25\text{ °C}$ | 435 | A |
| | | $T_C = 100\text{ °C}$ | 230 | |
| Single pulse forward current | I_{FSM} | Limited by junction temperature | TBD | |
| Maximum power dissipation per leg | P_D | $T_C = 25\text{ °C}$ | 781 | W |
| | | $T_C = 100\text{ °C}$ | 313 | |
| Operating junction and storage temperature range | T_J, T_{Stg} | | -40 to 150 | °C |
| RMS insulation voltage | V_{INS} | 50 Hz, circuit to base, all terminals shorted, $t = 1\text{ s}$ | 3500 | V |

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|------------------------------------|----------|---|------|------|------|-------|
| Cathode to anode breakdown voltage | V_{BR} | $I_R = 500\text{ }\mu\text{A}$ | 600 | - | - | V |
| Forward voltage drop per leg | V_{FM} | $I_F = 150\text{ A}$ | - | 1.23 | 1.53 | |
| | | $I_F = 300\text{ A}$ | - | 1.43 | 1.96 | |
| | | $I_F = 150\text{ A}, T_J = 125\text{ °C}$ | - | 1.11 | 1.29 | |
| | | $I_F = 300\text{ A}, T_J = 125\text{ °C}$ | - | 1.39 | 1.73 | |
| Maximum reverse leakage current | I_{RM} | $T_J = 150\text{ °C}, V_R = 600\text{ V}$ | - | - | 50 | m |

| DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | | | | | |
|--|------------------|--|---|------|------|------------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNITS |
| Reverse recovery time | t_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | $I_F = 50\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V (per leg)}$ | - | 130 | 165 | ns |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | - | 195 | 260 | |
| Peak recovery current | I_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | | - | 11 | 18 | A |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | - | 20 | 30 | |
| Reverse recovery charge | Q_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | | - | 670 | 1485 | nC |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | - | 1800 | 3900 | |
| Peak rate of recovery current | $di_{(rec)M}/dt$ | $T_J = 125\text{ }^\circ\text{C}$ | - | - | 400 | A/ μs | |
| Softness factor per leg | s | $I_F = 50\text{ A}, T_J = 25\text{ }^\circ\text{C}, di/dt = 400\text{ A}/\mu\text{s}, V_R = 200\text{ V}$ | | - | 0.2 | - | |
| | | $I_F = 50\text{ A}, T_J = 125\text{ }^\circ\text{C}, di/dt = 400\text{ A}/\mu\text{s}, V_R = 200\text{ V}$ | | - | 0.22 | - | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|--|-----------------------|--|------------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction operating and storage temperature range | T_J, T_{Stg} | | -40 to 150 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation | 0.16 | K/W |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, flat, smooth and greased | 0.05 | |
| Mounting torque $\pm 10\%$ | to heatsink busbar | A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow the spread of the compound. | 4 to 6 | Nm |
| Approximate weight | | | 200 | g |
| | | | 7.1 | oz. |
| Case style | | | INT-A-PAK | |

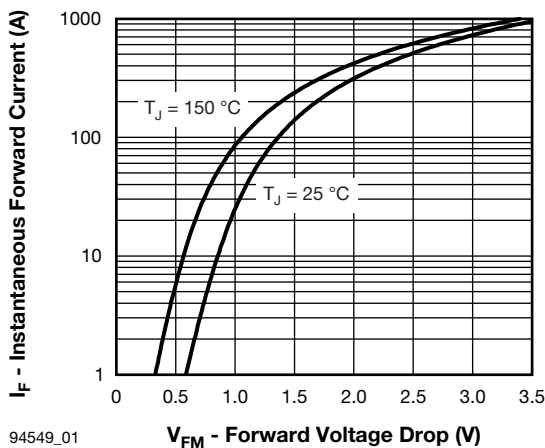


Fig. 1 - Maximum Forward Voltage Drop Characteristics

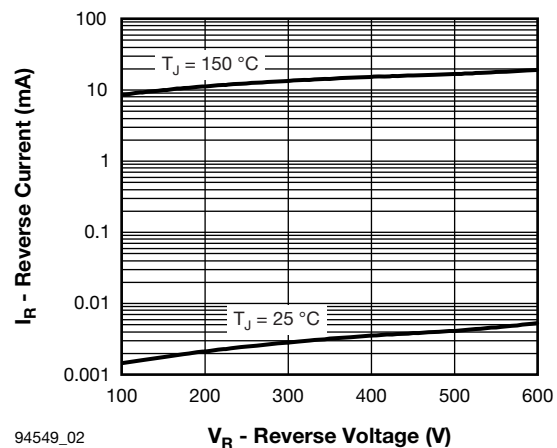
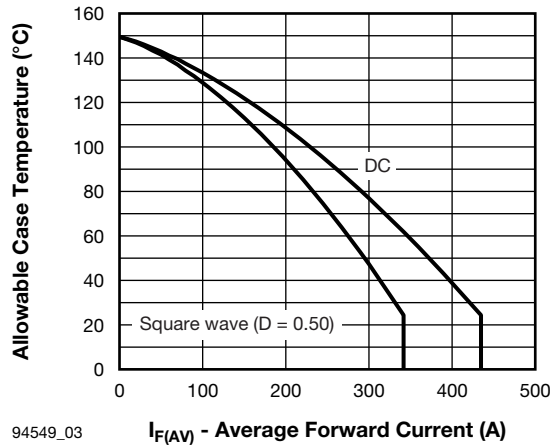
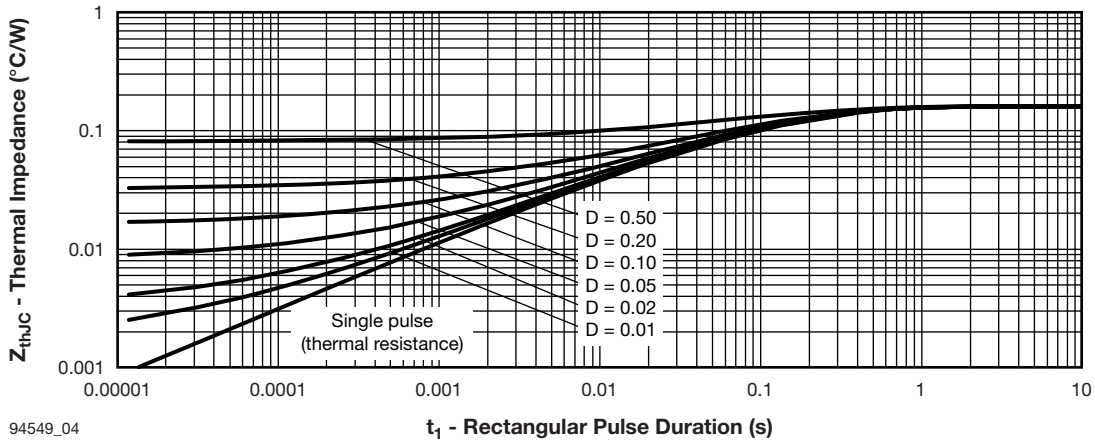


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



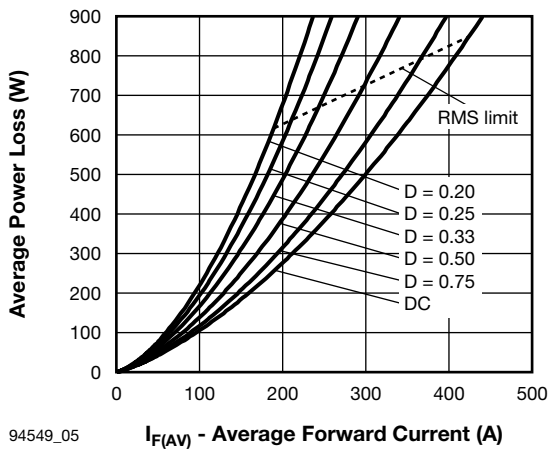
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Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current



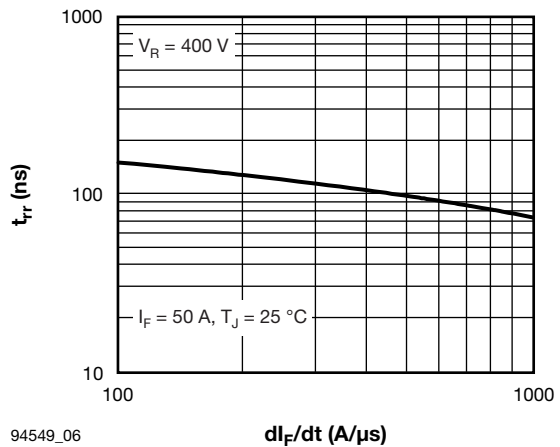
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Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



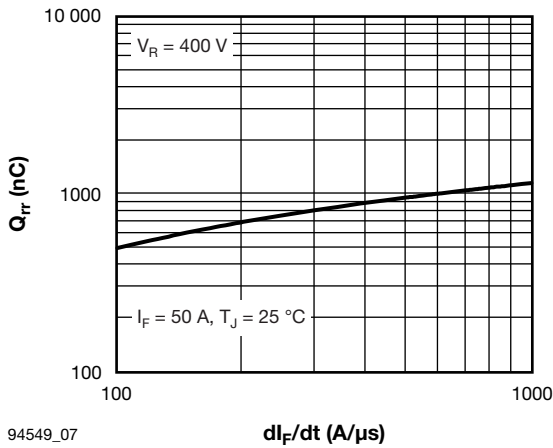
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Fig. 5 - Forward Power Loss Characteristics



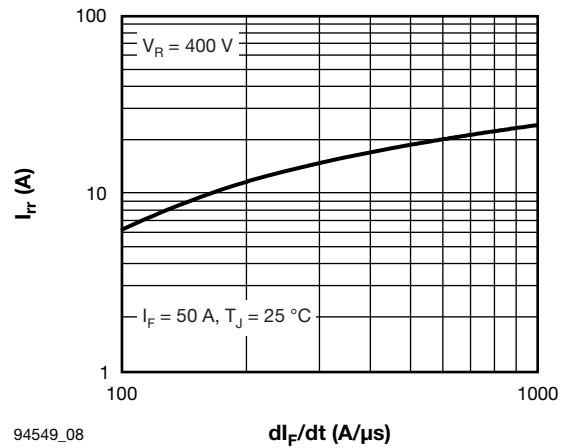
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Fig. 6 - Typical Reverse Recovery Time vs. di_F/dt (Per Leg)



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Fig. 7 - Typical Reverse Recovery Charge vs. di_F/dt (Per Leg)



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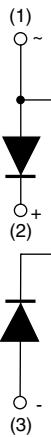
Fig. 8 - Typical Reverse Recovery Current vs. di_F/dt (Per Leg)

ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|--------------|-----------|----------|------------|-----------|------------|
| Device code | VS-VS | KD | U | 300 | 06 | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ |

- 1** - Vishay Semiconductors product
- 2** - Circuit configuration:
- 3** - U = Ultrafast diode
- 4** - Current rating (300 = 300 A)
- 5** - Voltage rating (06 = 600 V)
- 6** - PbF = Lead (Pb)-free

CIRCUIT CONFIGURATION

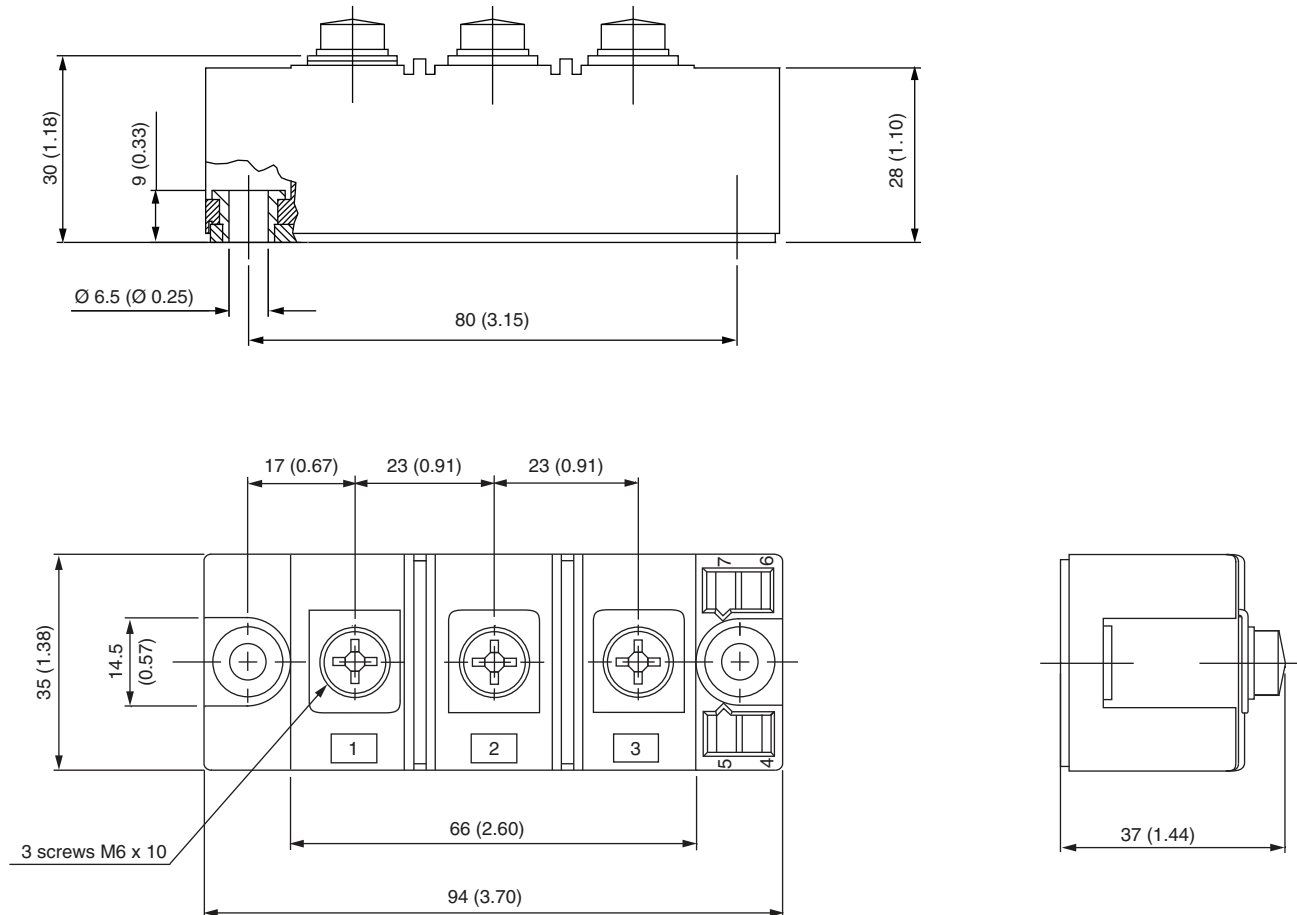


LINKS TO RELATED DOCUMENTS

| | |
|------------|--|
| Dimensions | www.vishay.com/doc?95254 |
|------------|--|

INT-A-PAK DBC

DIMENSIONS in millimeters (inches)





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- Техническая поддержка проекта;
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