

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


INT-A-PAK
FEATURES

- Electrically isolated: DCB base plate
- Standard JEDEC® package
- Simplified mechanical designs, rapid assembly
- High surge capability
- Large creepage distances
- 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**
PRIMARY CHARACTERISTICS

| | |
|-----------------------------------|----------------|
| V_R | 1200 V |
| V_F (typical) at 300 A at 25 °C | 2.18 V |
| t_{rr} (typical) at 45 A | 233 ns |
| $I_{F(DC)}$ at T_C | 300 A at 60 °C |
| Package | INT-A-PAK |
| Circuit configuration | Single diode |

REMARKS

- Product reliability results valid for $T_J = 150$ °C
- Recommended operation temperature $T_{op} = 150$ °C

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|------------------------------|------------|---|-------------|-------|
| Cathode to anode voltage | V_R | | 1200 | V |
| Continuous forward current | I_F | $T_C = 25$ °C | 375 | A |
| | | $T_C = 60$ °C | 300 | |
| Single pulse forward current | I_{FSM} | $T_J = 25$ °C | 2400 | |
| Maximum power dissipation | P_D | $T_C = 25$ °C | 1040 | W |
| | | $T_C = 60$ °C | 750 | |
| RMS isolation voltage | V_{ISOL} | 50 Hz, circuit to base, all terminal shorted, $t = 1$ s | 3500 | V |
| Junction temperature range | T_J | | -40 to +150 | °C |
| Storage temperature range | T_{Stg} | | -40 to +150 | |

ELECTRICAL SPECIFICATIONS PER LEG ($T_J = 25$ °C unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|------------------------------------|----------|--------------------------------|------|------|------|-------|
| Cathode to anode breakdown voltage | V_{BR} | $I_R = 500$ μ A | 1200 | - | - | V |
| Maximum forward voltage | V_{FM} | $I_F = 300$ A | - | 2.18 | 2.23 | |
| | | $I_F = 300$ A, $T_J = 150$ °C | - | 2.24 | 2.47 | |
| Maximum reverse leakage current | I_{RM} | $V_R = 1200$ V | - | 0.06 | 0.2 | mA |
| | | $T_J = 150$ °C, $V_R = 1200$ V | - | - | 20 | |



| DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified) | | | | | | | |
|--|-----------------|-------------------------|---|------|------|------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNITS |
| Diode reverse recovery charge | Q _{rr} | T _J = 25 °C | I _F = 45 A V _R = 400 V di _F /dt = 500 A/μs | - | 3.5 | - | μC |
| | | T _J = 125 °C | | - | 10.4 | - | |
| Reverse recovery time | t _{rr} | T _J = 25 °C | | - | 233 | - | ns |
| | | T _J = 125 °C | | - | 396 | - | |
| Reverse recovery current | I _{rr} | T _J = 25 °C | | - | 30 | - | A |
| | | T _J = 125 °C | | - | 53 | - | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | |
|---|-----------------------|---|-----------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum internal thermal resistance, junction to case per leg | R _{thJC} | DC operation | 0.12 | °C/W |
| Typical thermal resistance, case to heatsink per module | R _{thCS} | Mounting surface flat, smooth, and greased | 0.05 | |
| Mounting torque ± 10 % | to heatsink busbar | A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound | 4 to 6 | Nm |
| Approximate weight | | | 200 | g |
| | | | 7.1 | oz. |
| Case style | | | INT-A-PAK | |

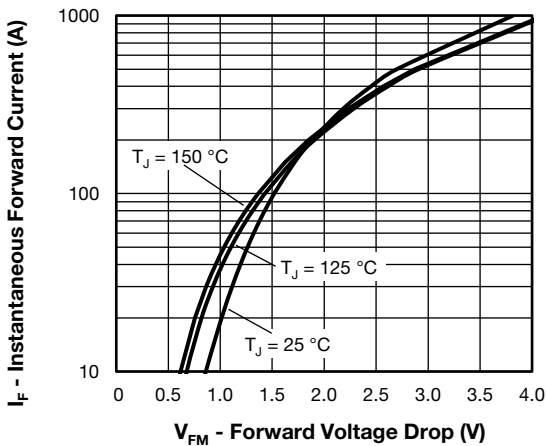


Fig. 1 - Typical Forward Voltage Drop Characteristics

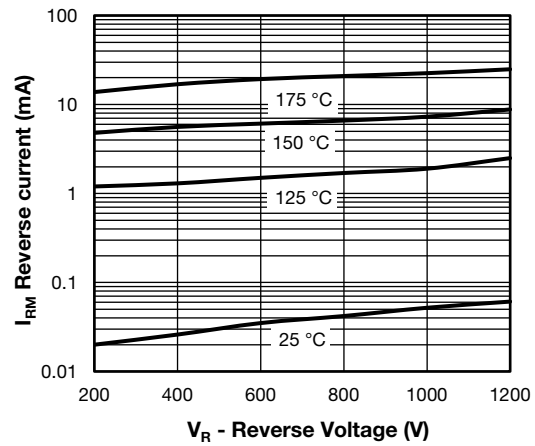


Fig. 2 - Typical Value of Reverse Current vs. Reverse Voltage

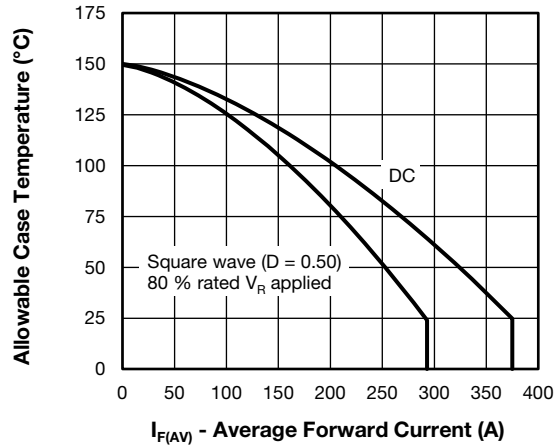


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

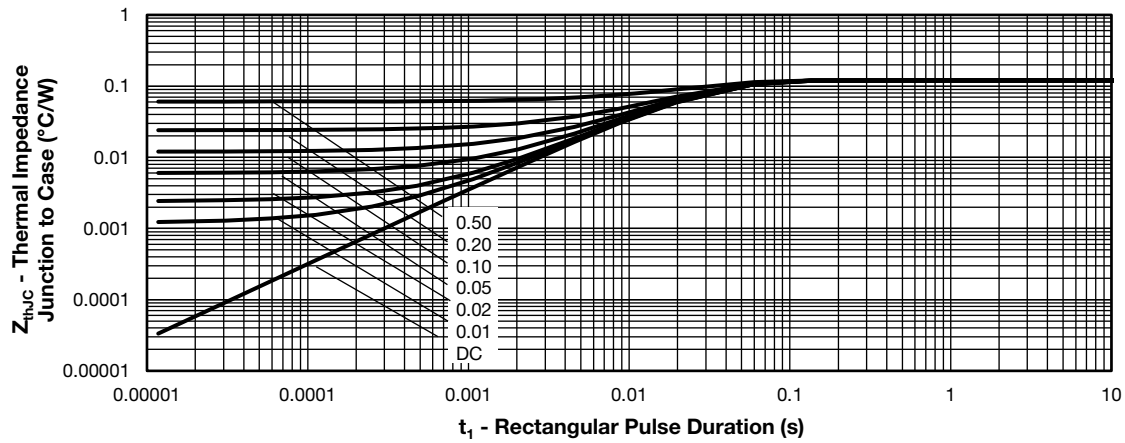


Fig. 4 - Maximum Thermal Impedance R_{thJC} Characteristics

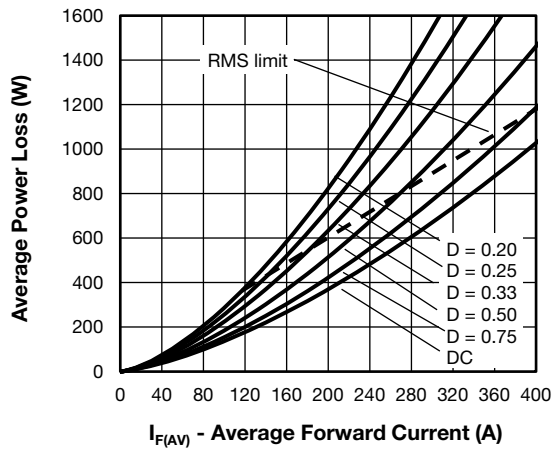


Fig. 5 - Forward Power Loss Characteristics

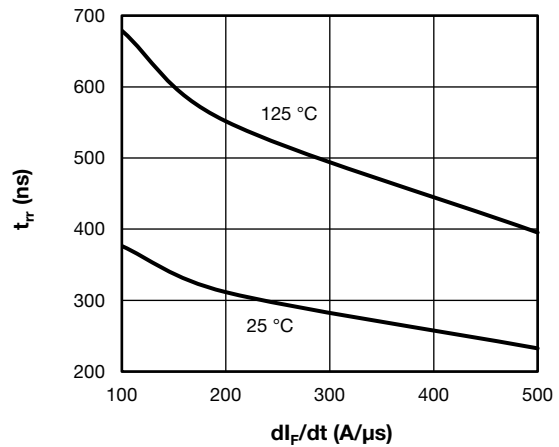


Fig. 6 - Typical Reverse Recovery Time vs. di_F/dt

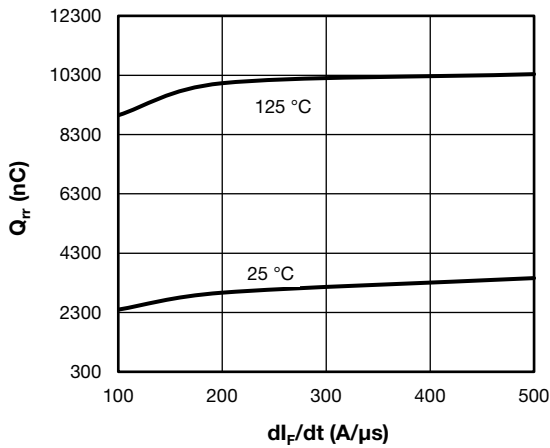


Fig. 7 - Typical Reverse Recovery Charge vs. di_F/dt

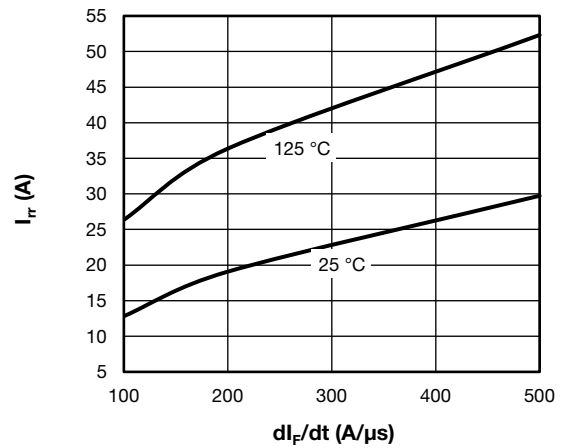


Fig. 8 - Typical Reverse Recovery Current vs. di_F/dt

ORDERING INFORMATION TABLE

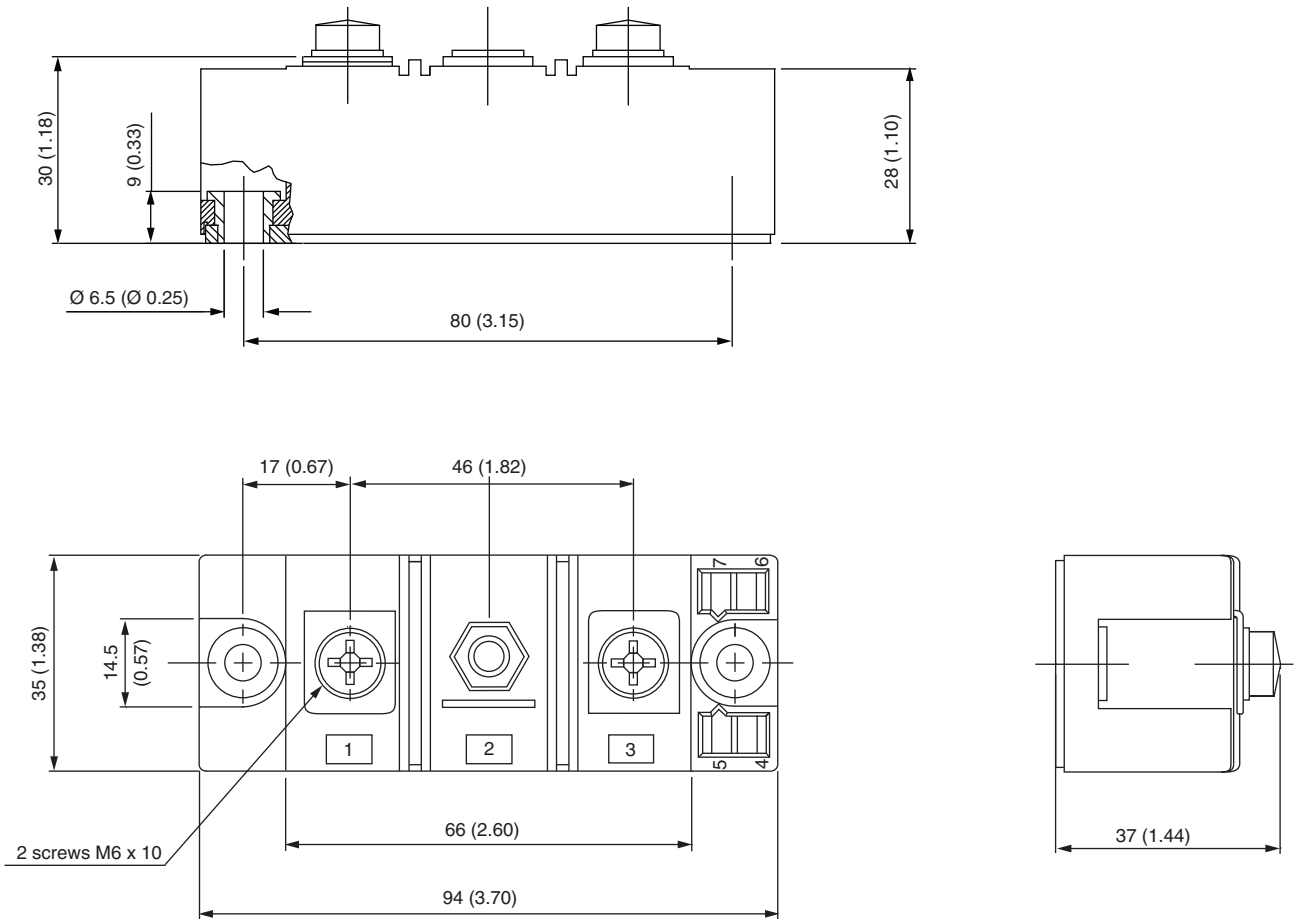
| | | | | | | | |
|-------------|--------------|-----------|-------------------------------|------------|----------|-----------|------------|
| Device code | VS-VS | KE | U | 300 | / | 12 | PbF |
| | ① | ② | ③ | ④ | | ⑤ | ⑥ |
| | 1 | - | Vishay Semiconductors product | | | | |
| | 2 | - | KE = circuit configuration | | | | |
| | 3 | - | U = ultrafast diode | | | | |
| | 4 | - | Current rating 300 = 300 A | | | | |
| | 5 | - | Voltage rating (12 = 1200 V) | | | | |
| | 6 | - | PbF = lead (Pb)-free | | | | |

CIRCUIT CONFIGURATION



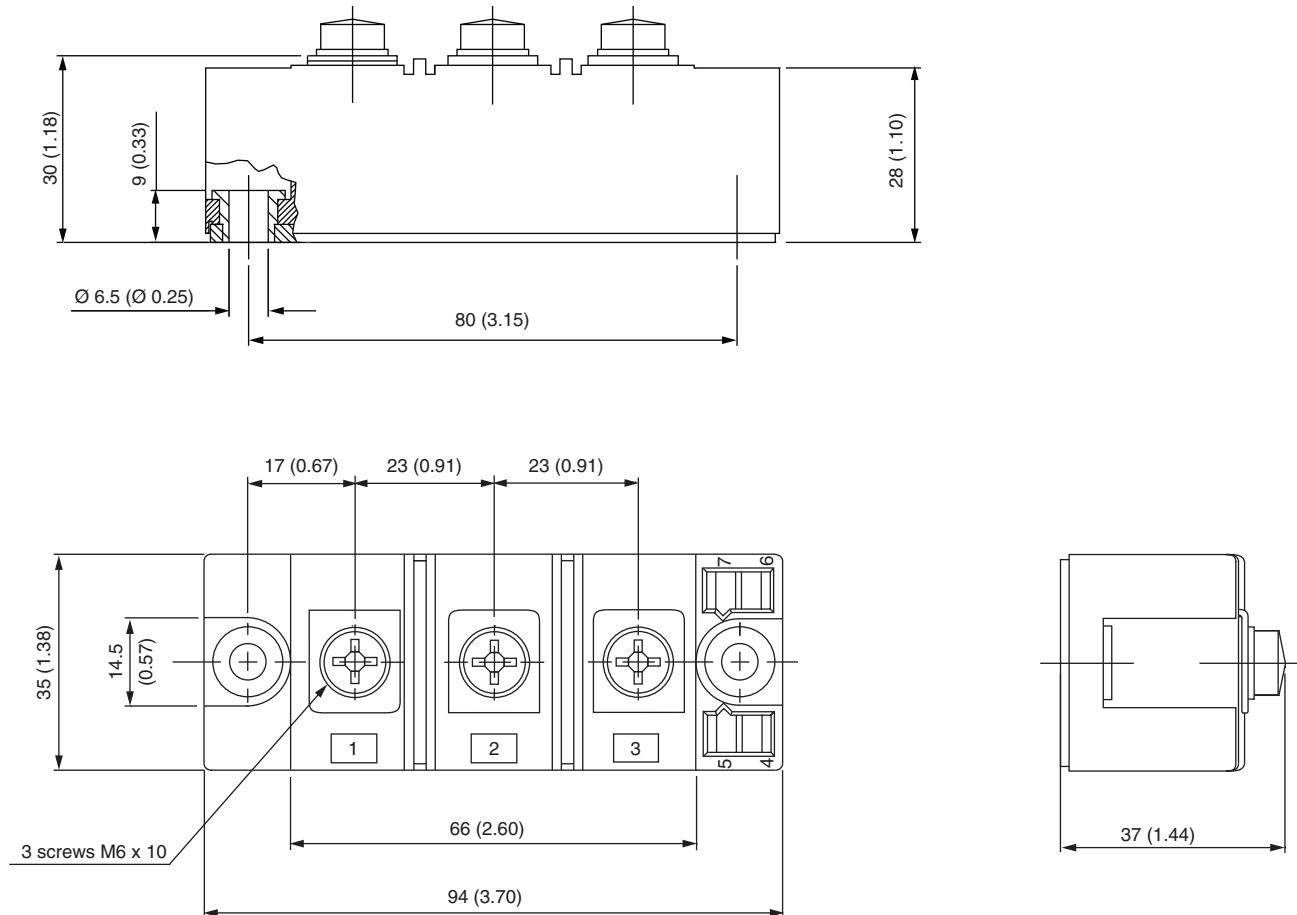


DIMENSIONS in (inches) millimeters **INT-A-PAK DBC**



INT-A-PAK DBC

DIMENSIONS in millimeters (inches)





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