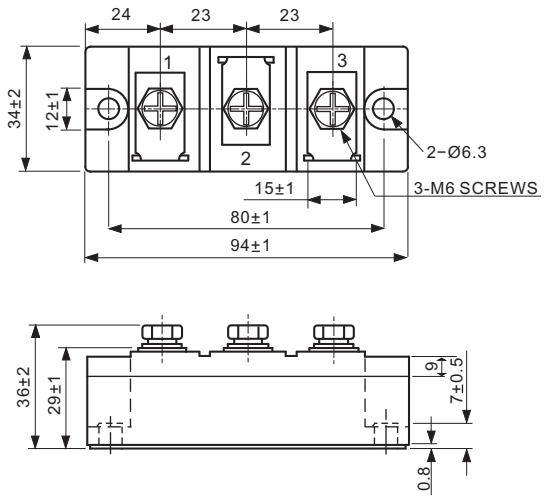
# Standard Recovery Diodes, 200 A
# (INT-A-PAK Power Modules)




All dimensions in millimeters

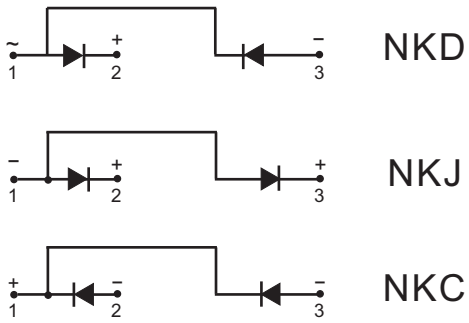
## FEATURES

- High voltage
- Electrically isolated by DBC ceramic ($Al_2O_3$)
- 3000 $V_{RMS}$ isolating voltage
- Industrial standard package
- High surge capability
- Modules uses high voltage power diodes in four basic configurations
- Simple mounting
- UL approved file E320098
- Compliant to RoHS
- Designed and qualified for multiple level

RoHS COMPLIANT

## APPLICATIONS

- DC motor control and drives
- Battery charges
- Welders
- Power converters




| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 200 A |
| Type | Modules - Diode, High Voltage |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| **SYMBOL** | **CHARACTERISTICS** | **VALUE** | **UNITS** |
| $I_{F(AV)}$ | | 200 | A |
| | $T_C$ | 100 | °C |
| $I_{F(RMS)}$ | | 314 | A |
| $I_{FSM}$ | 50 Hz | 8000 | |
| | 60 Hz | 8376 | |
| $I^2t$ | 50 Hz | 320 | $kA^2s$ |
| | 60 Hz | 291 | |
| $I^2\sqrt{t}$ | | 3200 | $kA^2\sqrt{s}$ |
| $V_{RRM}$ | | 400 to 1600 | V |
| $T_J$ | Range | -40 to 150 | °C |

## ELECTRICAL SPECIFICATIONS

### VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | $V_{RRM}$, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | $V_{RSM}$, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | $I_{RRM}$ AT 150 °C mA |
|---|---|---|---|---|
| NKD200<br>NKJ200<br>NKC200 | 04 | 400 | 500 | 12 |
| | 08 | 800 | 900 | |
| | 12 | 1200 | 1300 | |
| | 14 | 1400 | 1500 | |
| | 16 | 1600 | 1700 | |

### FORWARD CONDUCTION

| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUE | UNITS |
|---|---|---|---|---|---|---|
| Maximum average on-state current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | | 200 | A |
| | | | | | 100 | °C |
| Maximum RMS on-state current | $I_{F(RMS)}$ | 180° conduction, half sine wave ,50Hz ,$T_C$ = 100°C | | | 314 | A |
| Maximum peak, one-cycle, on-state non-repetitive surge current | $I_{FSM}$ | t = 10 ms | No voltage reapplied | Sine half wave, initial $T_J$ = $T_J$ maximum | 8000 | A |
| | | t = 8.3 ms | | | 8376 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | | | 320 | $kA^2s$ |
| | | t = 8.3 ms | | | 291 | |
| | | t = 10 ms | 100%$V_{RRM}$ reapplied | | 224 | |
| | | t = 8.3 ms | | | 204 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reapplied | | | 3200 | $kA^2\sqrt{s}$ |
| Maximum forward voltage drop | $V_{FM}$ | $I_{FM}$ = 600A , $T_J$ = 25 °C, 180° conduction | | | 1.4 | V |

### BLOCKING

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Maximum peak reverse and off-state leakage current | $I_{RRM}$ | $T_J$ = 150 °C | 12 | mA |
| RMS isolation Voltage | $V_{ISO}$ | 50 Hz, circuit to base ,all terminals shorted ,t = 1s | 3000 | V |
| | | t = 60s | 2500 | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TEST CONDITIONS** | **VALUES** | **UNITS** |
| Maximum junction operating temperature range | $T_{Stg}$ , $T_J$ | | - 40 to 150 | °C |
| Maximum thermal resistance, junction to ca se per junction | $R_{thJC}$ | DC operation | 0.21 | °C/W |
| Maximum thermal resistance, case to heatsink per module | $R_{thCS}$ | Mounting surface, smooth , flat and greased | 0.075 | |
| Mounting torque ± 10 % — IAP to heatsink, M6 / busbar to IAP, M6 | | 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. Lubricated threads. | 4 to 6 | N.m |
| Approximate weight | | | 220 | g |
| | | | 7.8 | oz. |
| Case style | | | New INT-A-PAK | |

ORDERING INFORMATION TABLE

**Device code**

| 1 | 2 | | 3 | 4 |
|---|---|---|---|---|
| NKD | 200 | / | 16 | A |

1 - Module type: NKD, NKJ and NKC for (Diode + Diode) module

2 - Current rating: $I_{F(AV)}$

3 - Voltage code x 100 = $V_{RRM}$

4 - Assembly type,"A" for soldering type

Fig.1 On-state current vs. voltage characteristic

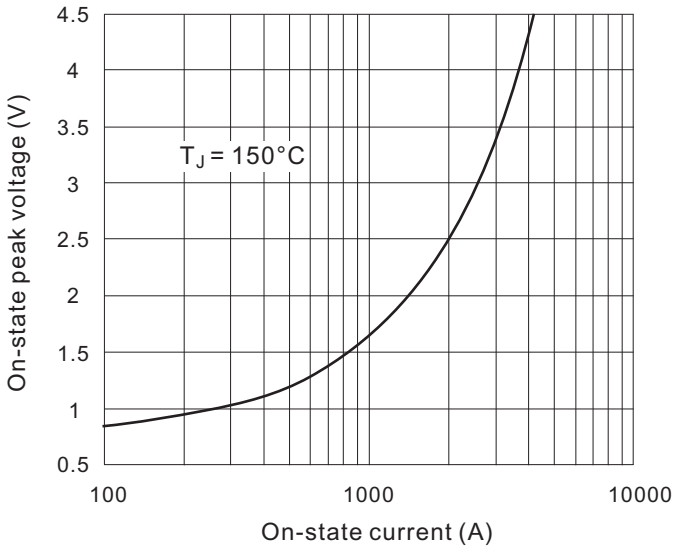



Fig.2 Transient thermal impedance(junction-case)

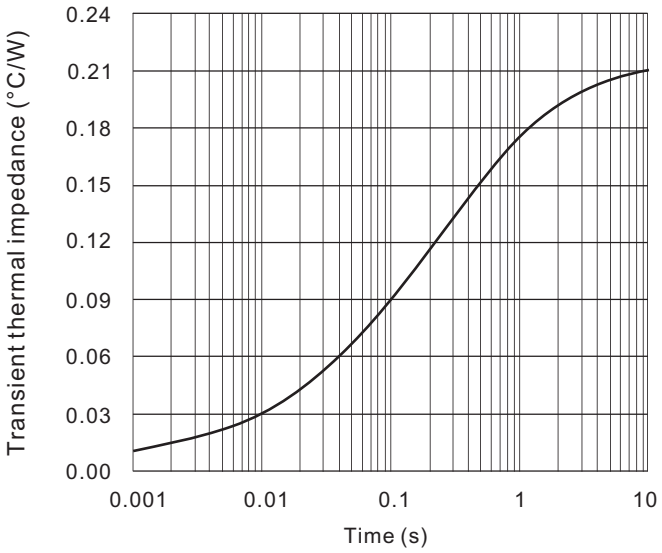



Fig.3 Power consumption vs. average current

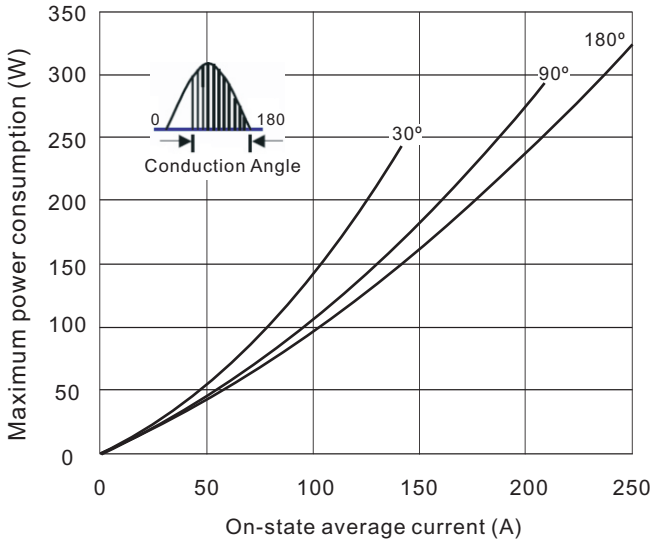



Fig.4 Case temperature vs. on-state average current

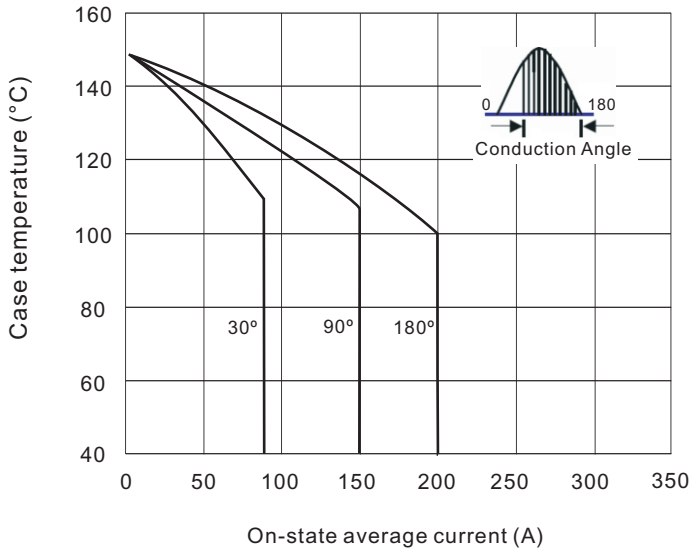



Fig.5 On-state surge current vs. cycles

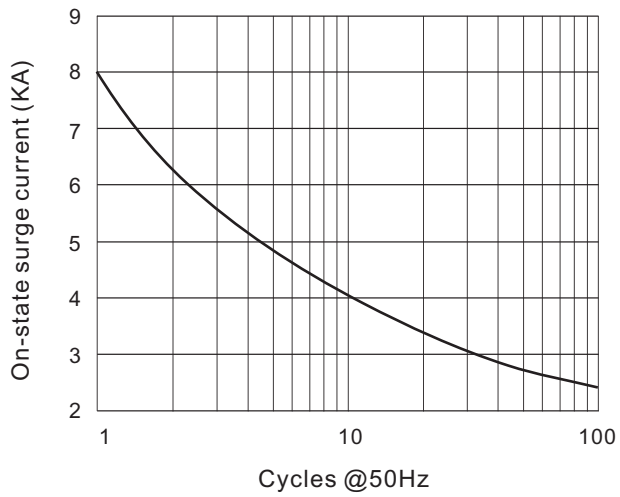



Fig.6 $I^2t$ Characteristic