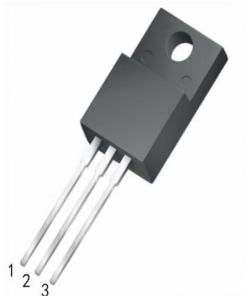
# XNC65R380F

**650V N-Channel SuperJunction MOSFET**

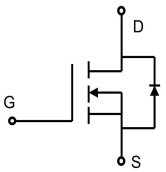
## 1.Features

- $V_{DS}$ 650V
- $I_D$ 11A
- $R_{DS(on)}$(at $V_{GS}$=10V) 340mΩ

ITO220AB




1.Gate
2. Drain
3. Source




## 2.Mechanical Data

- Case:Molded Plastic,TO-220;
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: marked on body.
- Mounting Position : Any.

## 3.Maximum Ratings and Electrical Characteristics

Electrical Characteristics (TJ=25℃ unless otherwise noted)

| Characteristics | | Symbol | Ratings | | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 650 | | V |
| Gate-Source Voltage | | $V_{GS}$ | ±30 | | V |
| Drain Current-Continuous | $T_C$=25°C | $I_D$ | 11 | | A |
| Drain Current – Pulsed(Note1) | | $I_{DM}$ | 31.8 | | A |
| Maximum Power Dissipation | | $P_D$ | 84.5 | | W |
| Single Pulsed Avalanche energy(Note1) | | $E_{AS}$ | 220 | | mJ |
| Junction and Storage Temperature Range | | $T_J$,$T_{stg}$ | -55 to +150 | | °C |
| **Thermal Characteristics** | | | | | |
| Parameter | | Symbol | Typ | Max | Unit |
| Thermal Resistance, Junction-to-Case | | $R_{\theta JC}$ | - | 1.48 | °C/W |
| Thermal Resistance, Junction-to-Ambient | | $R_{\theta JA}$ | - | 62 | °C/W |

| Characteristics | Symbol | Test conditions | Min | TYP | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC PARAMETERS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$= 0V,$I_D$=250μA | 650 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$= 650V,$V_{GS}$= 0V | - | - | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$= ±30V,$V_{DS}$= 0V | - | - | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$=$V_{DS,}$ $I_D$=250μA | 2 | - | 4 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V， $I_D$=5.5A | - | 340 | 380 | mΩ |
| **DYNAMIC PARAMETERS** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =50V<br>$V_{GS}$=0V<br>f=400KHZ | - | 1160 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 55 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 3.3 | - | |
| **SWITCHING PARAMETERS** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 325V, $I_D$ = 10.6 A, $V_{GS}$ =10V, $R_G$ =25Ω(Note1) | - | 18 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 31 | - | |
| Turn-off Delay Time | $t_{d(off)}$ | | - | 65 | - | |
| Turn-off Fail Time | $t_r$ | | - | 28 | - | |
| Total Gate Charge | $Q_g$ | $V_{DD}$=520V, $I_D$=10.6A<br>$V_{GS}$=10V (Note1) | - | 20 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 3.7 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 9 | - | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V , $I_S$=10.6A , $T_J$=25℃ | - | 1.4 | - | V |
| Reverse Recovery Time | trr | $I_{SD}$ = 10.6 A, $V_{DD}$ = 100 V<br>$dI_F$/ dt = 100 A/μs | - | 323 | - | ns |
| Reverse Recovery Charge | Qrr | | - | 2.8 | - | uC |
| Reverse recovery current | $I_{rr}$ | | - | 17.5 | - | A |

Notes:

1. Pulse test: 300 μs pulse width, 2 % duty cycle

## 4.Rating And Characteristic Curves

Fig.1 $V_{DS}$ vs. $I_D$

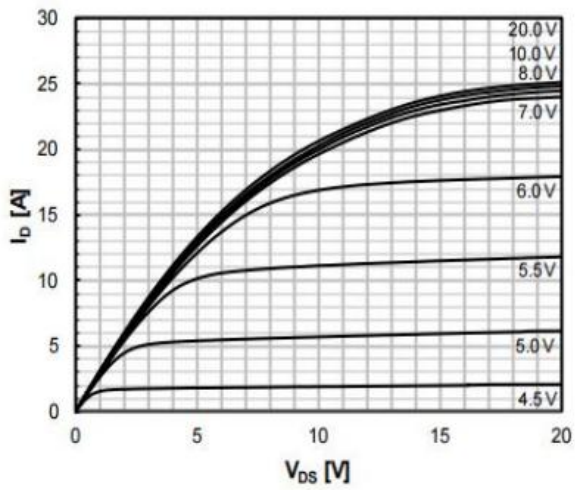



Fig.2 $V_{DS}$ vs. C(pF)

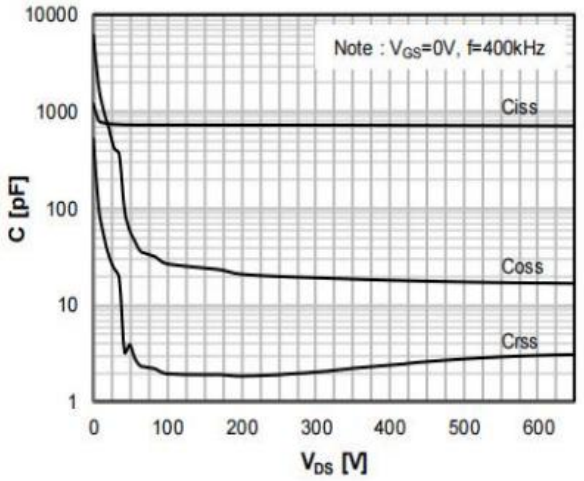



Fig.3 $I_D$ vs. $R_{DS(ON)}$

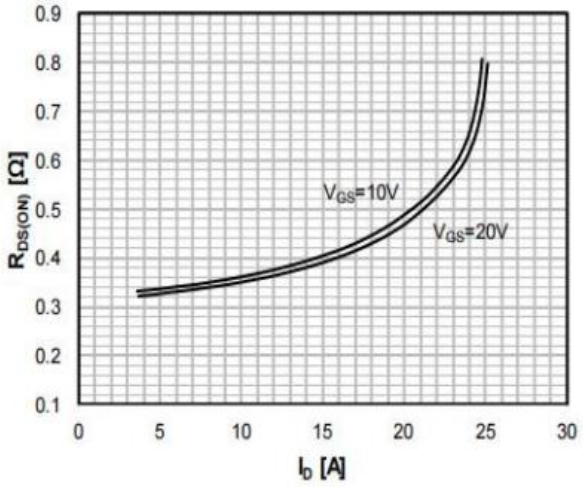



Fig.4 $T_J$ vs. $R_{DS(ON)}$

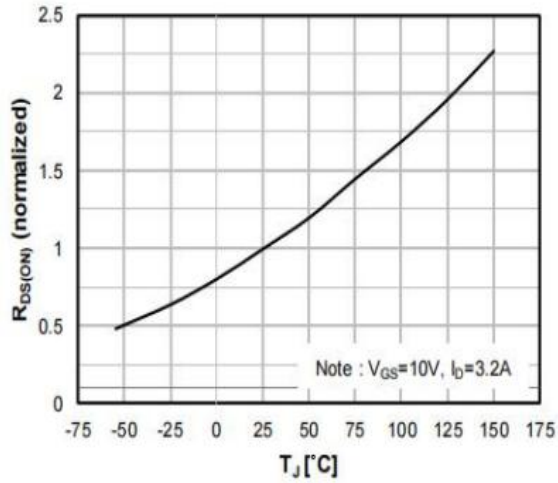



Fig.5 $V_{GS}$ vs.$I_D$

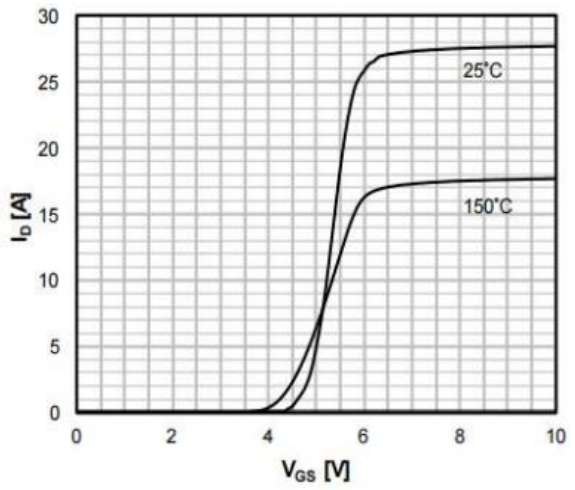



Fig.6 $T_J$ vs.$BV_{DSS}$

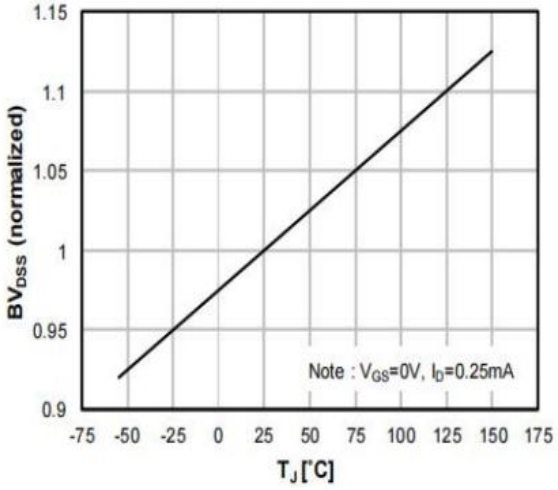


Fig.7 Qg vs. $V_{GS}$

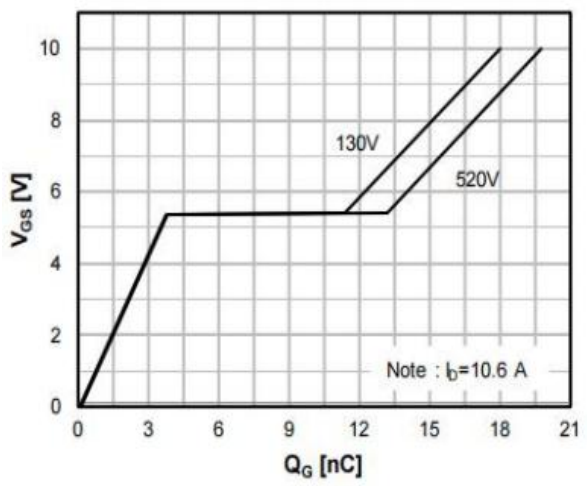



Fig.8 $T_C$ vs. $I_D$

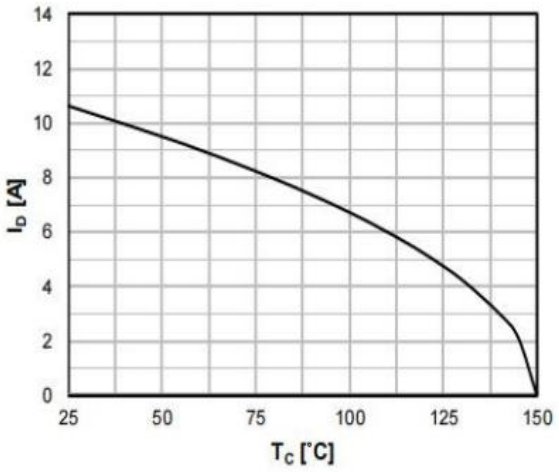



Fig.9 $T_P$ vs. $Z_{thj}$

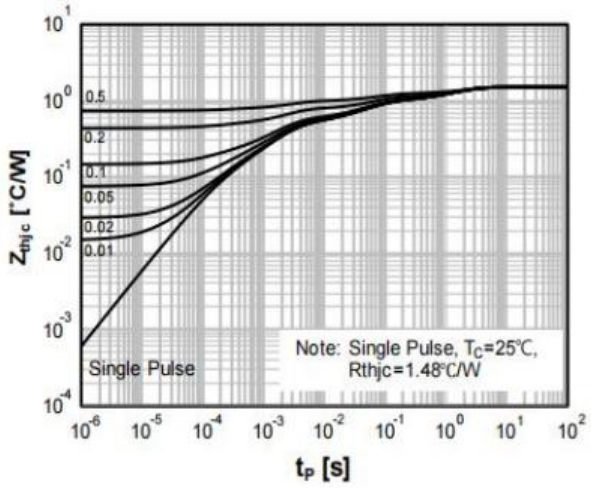



Fig.10 $V_{SD}$ vs. $I_S$

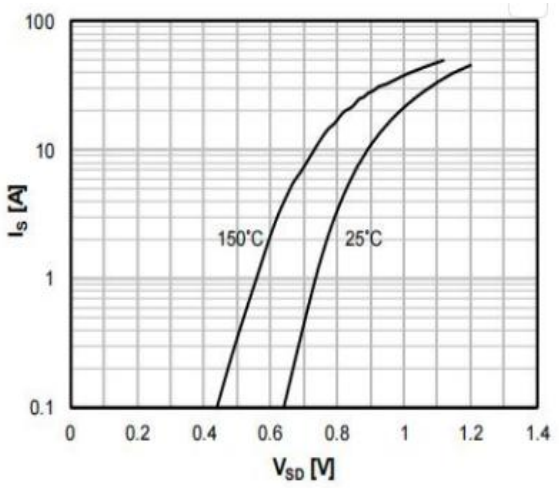



Fig.11 $T_P$ vs. $P_D$

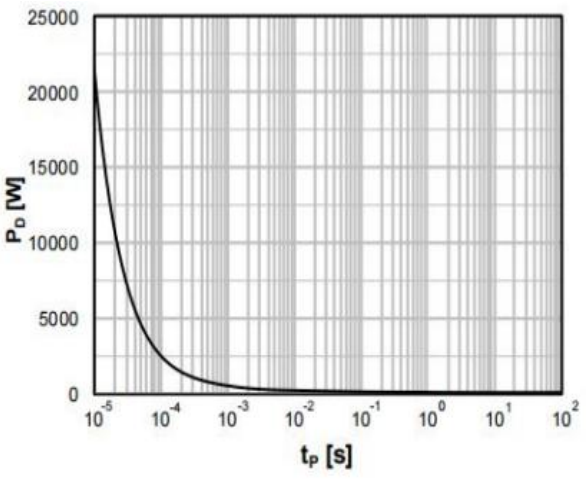
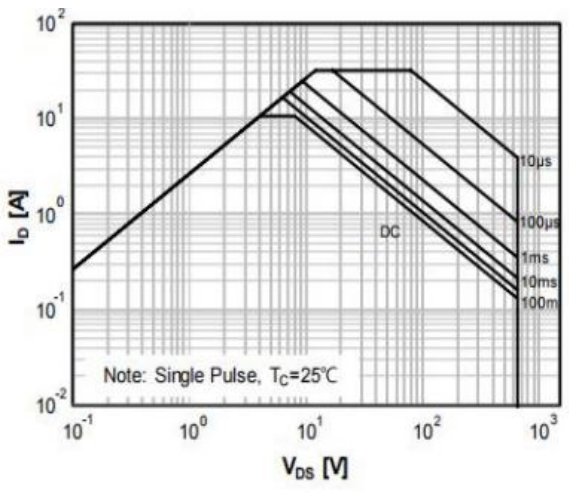
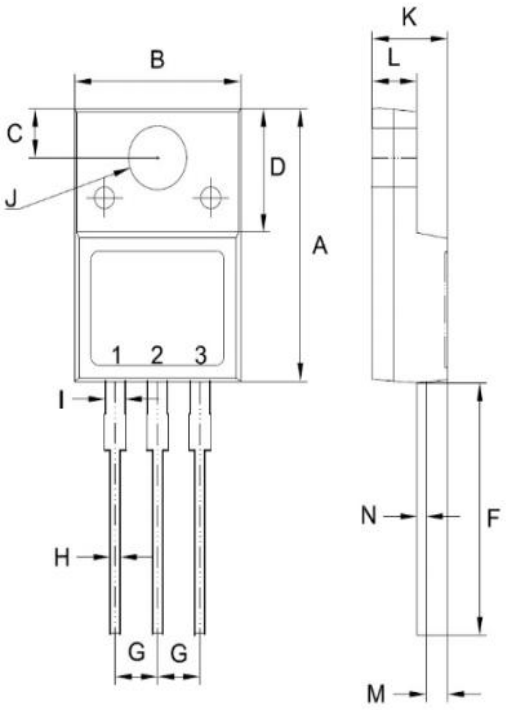



Fig.12 $V_{DS}$ vs.$I_D$

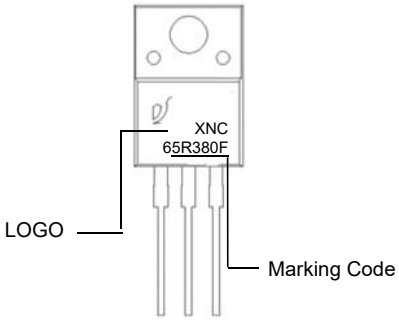


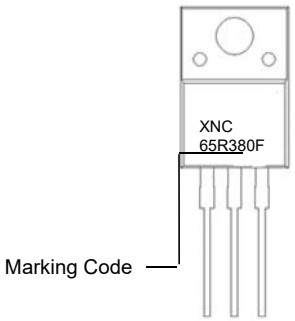
## 5.Dimensions




| Dimensions | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.571 | 0.646 | 14.50 | 16.40 |
| B | 0.374 | 0.413 | 9.50 | 10.50 |
| C | 0.098 | 0.140 | 2.50 | 3.55 |
| D | 0.248 | 0.287 | 6.30 | 7.30 |
| F | 0.488 | 0.551 | 12.40 | 14.00 |
| G | 0.093 | 0.108 | 2.35 | 2.75 |
| H | 0.012 | 0.037 | 0.30 | 0.95 |
| I | 0.035 | 0.059 | 0.90 | 1.50 |
| J | 0.114 | 0.150 | 2.90 | 3.80 |
| K | 0.167 | 0.198 | 4.24 | 5.02 |
| L | 0.091 | 0.115 | 2.30 | 2.92 |
| N | 0.016 | 0.025 | 0.40 | 0.63 |

## 6. Part Marking System




## 7. Package Information

| Package | Packing Type | Quantity(pcs) |
|---|---|---|
| ITO-220 | Tube | 50 |

# Important Notice and Disclaimer

- Reproducing and modifying information of the document is prohibited without from XINNUO.
- XINNUO reserves the right to make changes to this document and its products and specifications.
- XINNUO disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- XINNUO does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the here in document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications.XINNUO makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown her are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify XINNUO for any damages resulting from such improper use or sale.
- Since XINNUO uses lot number as the tracking base, please provide the lot number for tracking when complaining.