## Description

The SXJ6N80D protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, low operating voltage. It gives designer the flexibility to protect one bi-directional line in applications where arrays are not practical.

**General Features**

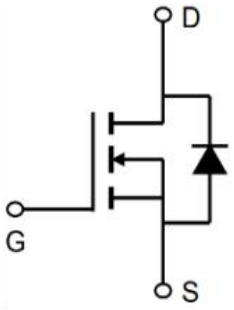
$V_{DS}$ = 800V (Type: 890V) IDM =12A

$R_{DS(ON)}$ <900mΩ @ $V_{GS}$=10V

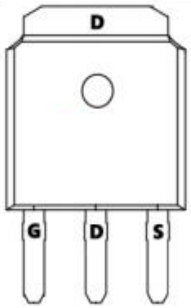
**Application**

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)




**TO-252-3L**


## Absolute Maximum Ratings ($T_C$=25℃unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| VDSS | Drain-Source Voltage ($V_{GS}$ = 0V) | 800 | V |
| ID | Continuous Drain Current | 6 | A |
| IDM | Pulsed Drain Current (note1) | 12 | A |
| VGS | Gate-Source Voltage | ±30 | V |
| $E_{AS}$ | Single Pulse Avalanche Energy (note2) | 225 | mJ |
| $P_D$ | Power Dissipation ($T_C$ = 25ºC) | 25.5 | W |
| TJ, Tstg | Operating Junction and Storage Temperature Range | -55~+150 | ºC |
| RthJC | Thermal Resistance, Junction-to-Case | 2 | ºC/W |
| RthJA | Thermal Resistance, Junction-to-Ambient | 62.5 | ºC/W |

## Electrical Characteristics ($T_J$=25℃, unless otherwise noted)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| V(BR)DSS | Drain-source breakdown voltage | VGS=0V, ID=250μA | 800 | - | - | V |
| V(GS)th | Gate threshold voltage | VDS=VGS, ID=250μA | 2.5 | 3.5 | 4.5 | V |
| IDSS | Zero gate voltage drain current | VDS=800V, VGS=0V, Tj=25°C | - | - | 1 | μA |
| IDSS | Zero gate voltage drain current | VDS=800V, VGS=0V, Tj=150°C | | | 10 | μA |
| IGSS | Gate-source leakage current | VGS=±30V, VDS=0V | - | - | ±100 | nA |
| RDS(on) | Drain-source on-state resistance | VGS=10V, ID=2.5A, Tj=25°C | - | 800 | 900 | mΩ |
| RDS(on) | Drain-source on-state resistance | VGS=10V, ID=2.5A, Tj=150°C | | 2000 | 5000 | mΩ |
| Ciss | Input capacitance | VGS=0V, VDS=50V, f=1MHz | - | 541 | - | pF |
| Coss | Output capacitance | | - | 31.6 | - | pF |
| Crss | Reverse transfer capacitance | | - | 1.33 | - | pF |
| td(on) | Turn-on delay time | VDD=400V, VGS=13V, ID=2.2A, | - | 17.6 | - | ns |
| tr | Rise time | | - | 22.4 | - | ns |
| td(off) | Turn-off delay time | | - | 64.2 | - | ns |
| tf | Fall time | | - | 28.2 | - | ns |
| Qgs | Gate to source charge | VDD=400V, ID=4A, VGS=0 to 10V | - | 2.7 | - | nC |
| Qgd | Gate to drain charge | | - | 4.97 | - | nC |
| Qg | Gate charge total | | - | 10.7 | - | nC |
| Vplateau | Gate plateau voltage | | - | 5.42 | - | V |
| VSD | Diode forward voltage | VGS=0V, IF=5A, Tf=25°C | - | 0.86 | - | V |
| trr | Reverse recovery time | VR=400V, IF=1.1A, diF/dt=100A/μs | - | 181 | - | ns |
| Qrr | Reverse recovery charge | | - | 0.74 | - | μC |
| Irrm | Peak reverse recovery current | | - | 8.68 | - | A |

**Note：**

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2、The EAS data shows Max. rating . L=0.5mH, IAS =5.0A, VDD =50V, RG=25Ω
3、The test condition is Pulse Test: ISD ≤ ID, di/dt = 100A/us, VDD≤ BVDSS, Starting at TJ =25℃
4、The power dissipation is limited by 150℃junction temperature
5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

## Typical Characteristics

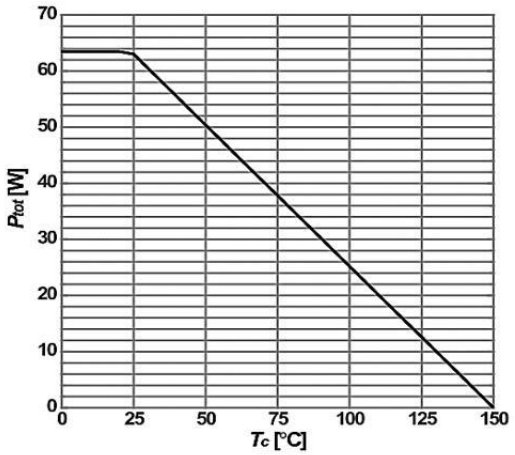



**Figure1: Power dissipation (Non FullPAK)**

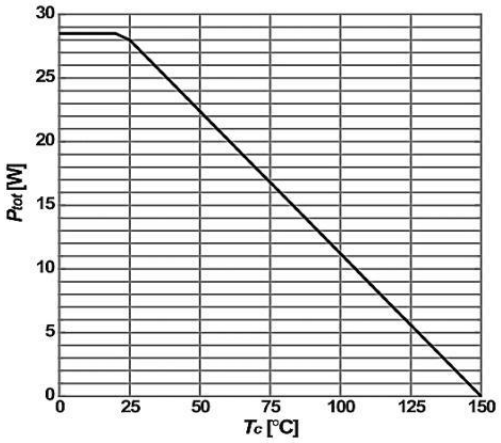



**Figure2: Power dissipation (FullPAK)**

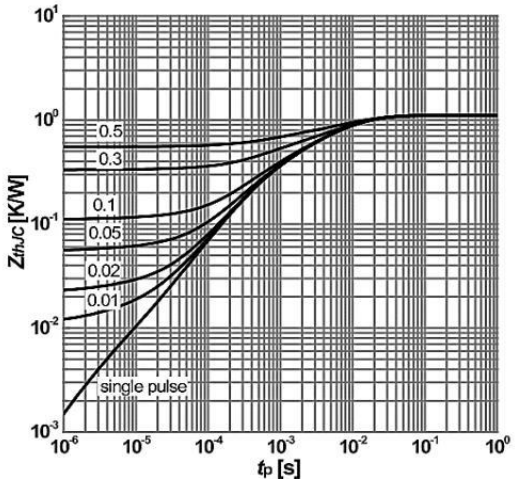



**Figure3:Max. transient thermal impedance**
zn. c=f(tp);parameter:D=tT

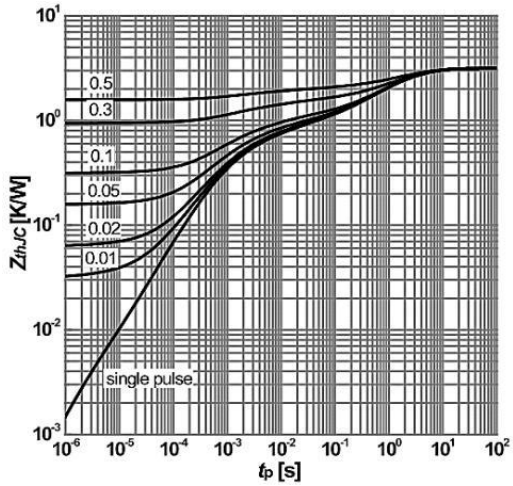



**Figure4:Max. transient thermal impedance**
zn. c=f(tp);parameter:D=t pT

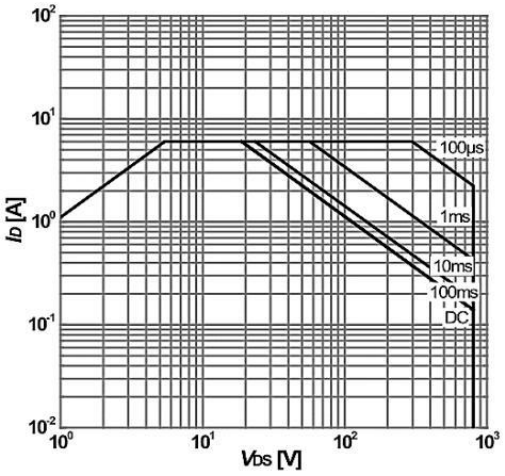



**Figure5: Safe operating area (Non FullPAK)**
o=f(vos);T=25c;D=0;parameter:tb

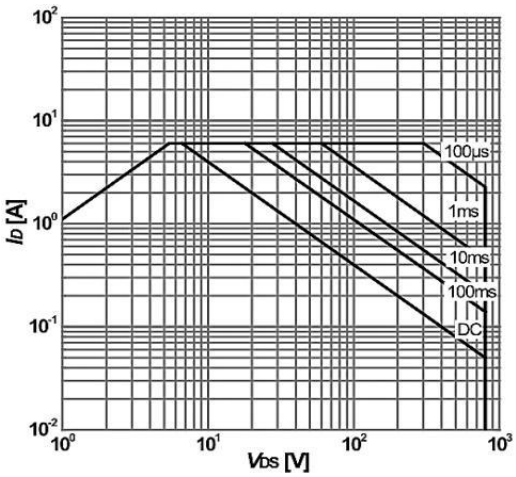



**Figure6: Safe operating area (FullPAK)**
o=f(vos);T=25"c;D=0;parameter:tb

## Typical Characteristics

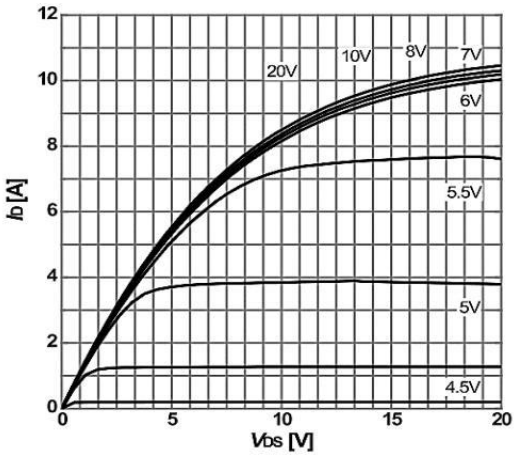



**Figure 7: Typ. outp ut characteristics**

$I_D=f(V_{DS})$; $Tj=25°C$; parameter: $V_{GS}$

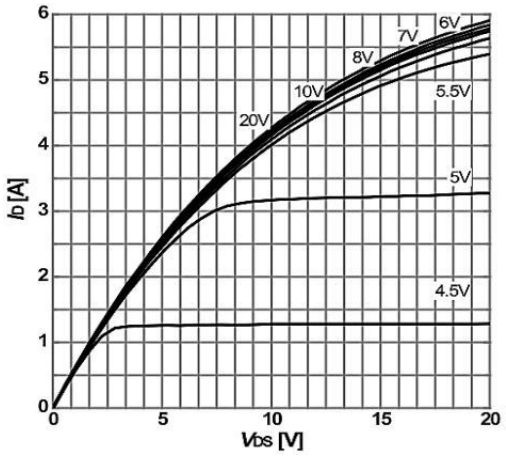



**Figure8 : Typ. output characteristics**

lo=f(vos);Tj=125c;parameter:vas

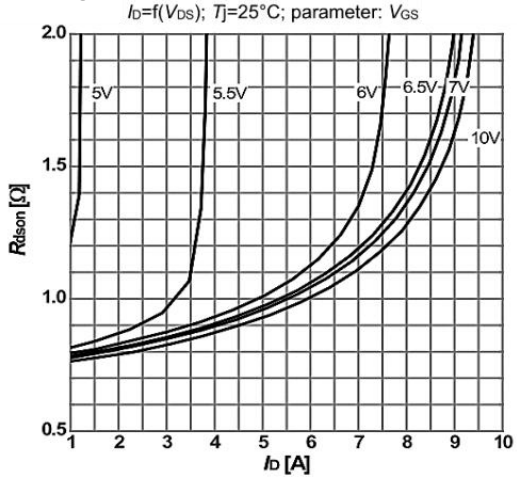



**Figure9 : Typ. drain-source on-state resistance**

ROS(on)=f(o);7J=25"c;parameter: vos

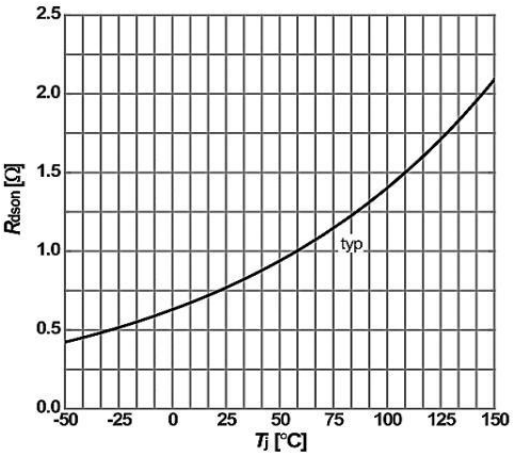



**Figure 10: drain -source on-state resistance**

ROS(on)=f(T);lo=3.2A;vas=10v

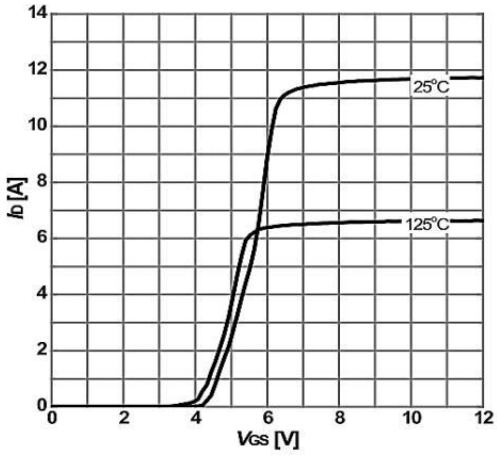



**Figure 11: Type. transfer characteristics**

lo=f(vas);vos=20v;parameter:T

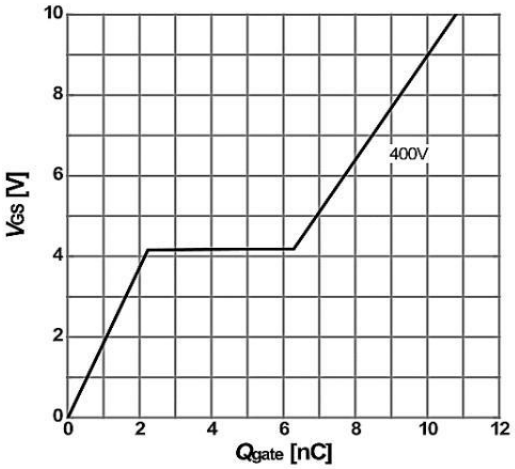
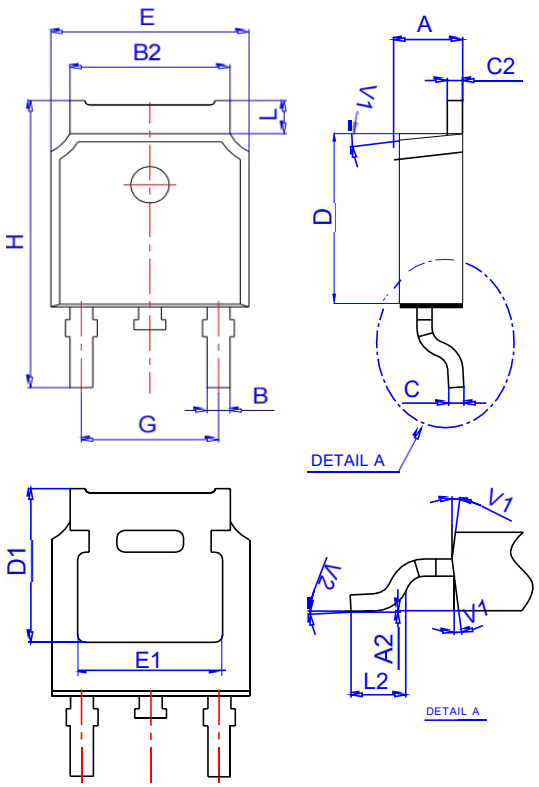



**Figure 12: Type. gate charge**

ves=f(Qa atg);IO=3.2A pulsed;vos=480v

## Package Mechanical Data:TO-252-3L




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.10 | | 2.50 | 0.083 | | 0.098 |
| A2 | 0 | | 0.10 | 0 | | 0.004 |
| B | 0.66 | | 0.86 | 0.026 | | 0.034 |
| B2 | 5.18 | | 5.48 | 0.202 | | 0.216 |
| C | 0.40 | | 0.60 | 0.016 | | 0.024 |
| C2 | 0.44 | | 0.58 | 0.017 | | 0.023 |
| D | 5.90 | | 6.30 | 0.232 | | 0.248 |
| D1 | 5.30REF | | | 0.209REF | | |
| E | 6.40 | | 6.80 | 0.252 | | 0.268 |
| E1 | 4.63 | | | 0.182 | | |
| G | 4.47 | | 4.67 | 0.176 | | 0.184 |
| H | 9.50 | | 10.70 | 0.374 | | 0.421 |
| L | 1.09 | | 1.21 | 0.043 | | 0.048 |
| L2 | 1.35 | | 1.65 | 0.053 | | 0.065 |
| V1 | | 7° | | | 7° | |
| V2 | 0° | | 6° | 0° | | 6° |

### Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| TAPING | TO-252-3L | | 2500 |