# AJ190SN065MTD

N-Channel Super Junction Power MOSFET

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---|---|---|
| 650V | 190mΩ@10V | 21A |

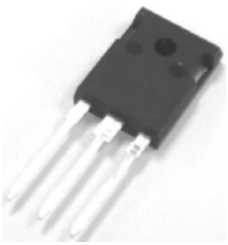
## Feature

- Low on-resistance
- Low gate charge

## Application

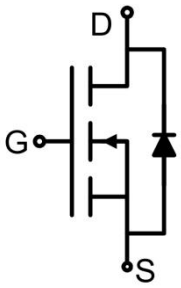
- Power factor correction (PFC)
- Uninterruptible Power Supply (UPS)

## Package

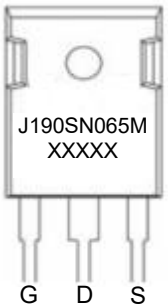


TO-247AB

## Circuit diagram




## Marking



## Absolute maximum ratings ($T_C$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage ($V_{GS}$=0V) | $V_{DS}$ | 650 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | V |
| Continuous Drain Current | $I_D$ | 21 | A |
| Pulsed Drain Current[1)] | $I_{DM}$ | 50 | A |
| Single Pulse Avalanche Energy[2)] | $E_{AS}$ | 500 | mJ |
| Power Dissipation[3)] | $P_D$ | 150 | W |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 0.82 | ℃/W |
| Operating Junction Temperature | $T_J$ | -55 ~ +150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | ℃ |

## Electrical characteristics ($T_J$=25 °C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ =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 | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±30V | | | ±100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 2.5 | 3.3 | 4.5 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =3.2A | | 150 | 190 | mΩ |
| **Dynamic characteristics[4)]** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =100V, $V_{GS}$ =0V, f =1MHz | | 1510 | | pF |
| Output Capacitance | $C_{oss}$ | | | 65 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 2.4 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =480V, $V_{GS}$ =10V, $I_D$ =11A | | 7.27 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 17.4 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 43.9 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DS}$ =400V, $V_{GS}$ =13V, $I_D$ =13A $R_G$ =4.7Ω | | 10 | | nS |
| Turn-on rise time | $t_r$ | | | 19.8 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 45.4 | | |
| Turn-off fall time | $t_f$ | | | 41.4 | | |
| **Source-Drain Diode characteristics** | | | | | | |
| Diode Forward Current | $I_S$ | | | | 21 | A |
| Diode Forward voltage | $V_{SD}$ | $V_{GS}$ =0V, $I_S$ =7.3A | | | 1.5 | V |
| Reverse Recovery Time | $T_{rr}$ | $V_{GS}$ =0V, $V_{dd}$=400V, $I_S$ =11A di/dt =100A/μs | | 288 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 3.66 | | uC |

Notes:

1) The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper.

2) The EAS data shows Max. rating . L=0.5mH, $I_{AS}$ =7A, $V_{DD}$ =50V, $R_G$=25Ω.

3) The power dissipation is limited by 150℃ junction temperature.

4) Guaranteed by design, not subject to production testing.

## Typical Characteristics

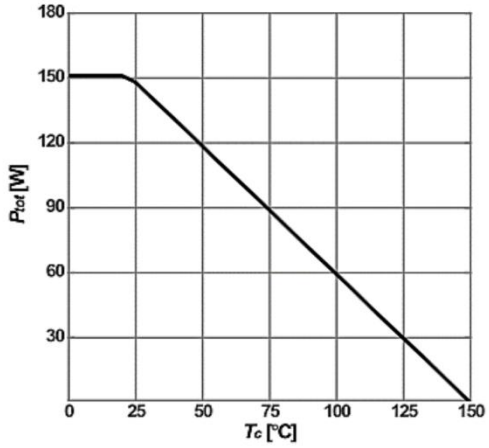



**Figure1: Power dissipation (Non FullPAK)**

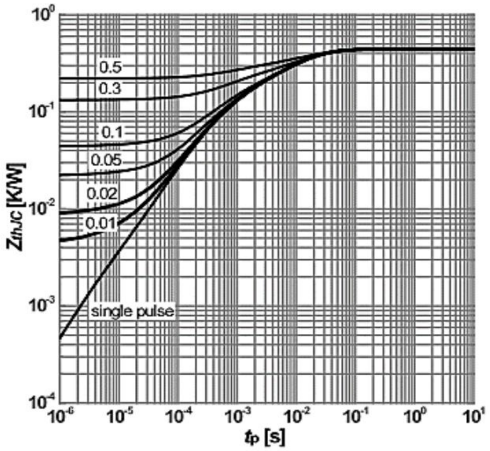



**Figure2:Max. transient thermal impedance**
$Z_{thJC}=f(t_p)$; parameter: $D= t_p/T$

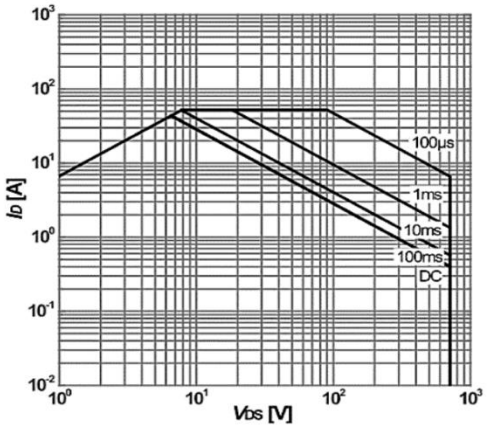



**Figure 3 : Safe operating area (Non FullPAK)**
$I_D=f(V_{DS})$; $T_j$=25°C; D=0; parameter: $t_p$

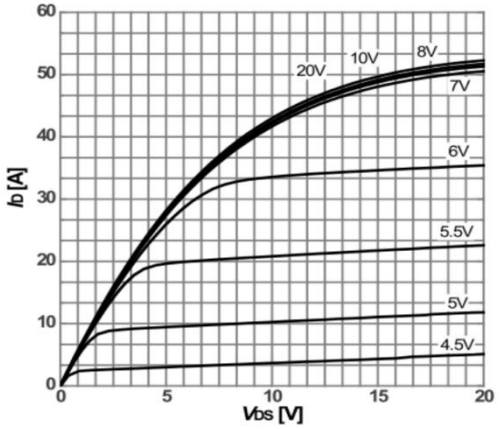



**Figure 4 : Typ. output characteristics**
$R_{DS}(on)=f(T_j)$; $I_D$=3.2A; $V_{GS}$=10V

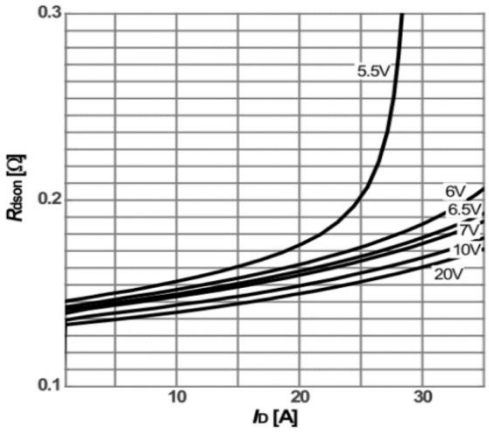
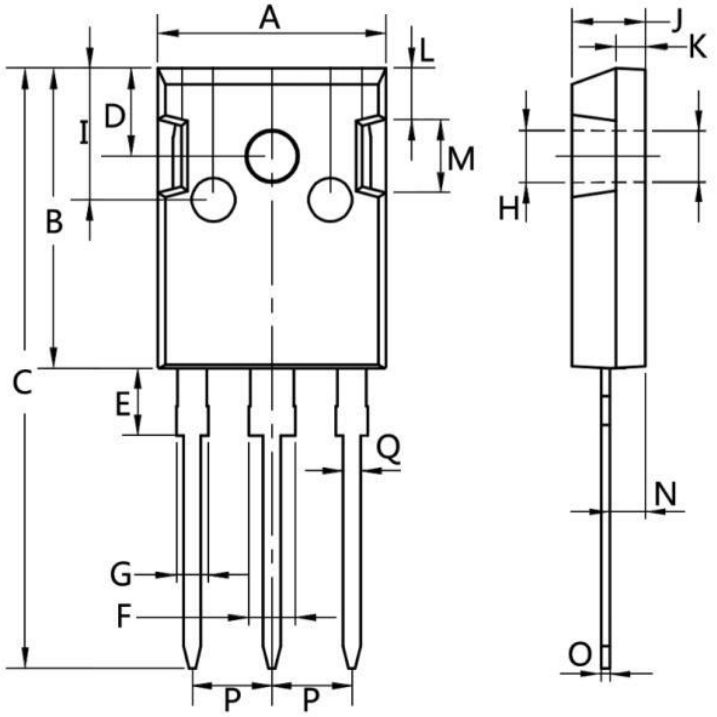



**Figure 5 : Type. gate charge**
$R_{DS}(on)=f(I_D)$; $T_j$=25°C; parameter: $V_{GS}$

## TO-247AB Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 15.000 | 16.000 | 0.591 | 0.630 |
| B | 20.000 | 21.000 | 0.787 | 0.827 |
| C | 41.000 | 42.000 | 1.614 | 1.654 |
| D | 5.000 | 6.000 | 0.197 | 0.236 |
| E | 4.000 | 5.000 | 0.157 | 0.197 |
| F | 2.500 | 3.500 | 0.098 | 0.138 |
| G | 1.750 | 2.500 | 0.069 | 0.098 |
| H | 3.000 | 3.500 | 0.118 | 0.138 |
| I | 8.000 | 10.000 | 0.315 | 0.394 |
| J | 4.900 | 5.100 | 0.193 | 0.201 |
| K | 1.900 | 2.100 | 0.075 | 0.083 |
| L | 3.500 | 4.000 | 0.138 | 0.157 |
| M | 4.750 | 5.250 | 0.187 | 0.207 |
| N | 2.000 | 3.000 | 0.079 | 0.118 |
| O | 0.550 | 0.750 | 0.022 | 0.030 |
| P | 5.080 BSC. | | 0.200 BSC. | |
| Q | 1.200 | 1.300 | 0.047 | 0.051 |