

# PJB24N10

## 100V N-Channel Enhancement Mode MOSFET

### FEATURES

- $R_{DS(ON)}$ ,  $V_{GS}@10V, I_{DS}@30A=24m\Omega$
- Low On Resistance
- Excellent Gate Charge x  $R_{DS(ON)}$  Product ( FOM )
- Fully Characterized Avalanche Voltage and Current
- Specially Designed for AC Adapter, High-Frequency Switch and Synchronous Rectification
- Component are in compliance with EU RoHS 2002/95/EC directives

### MECHANICAL DATA

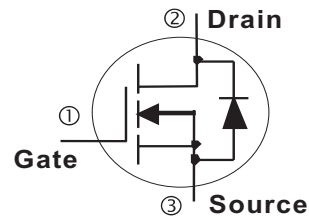
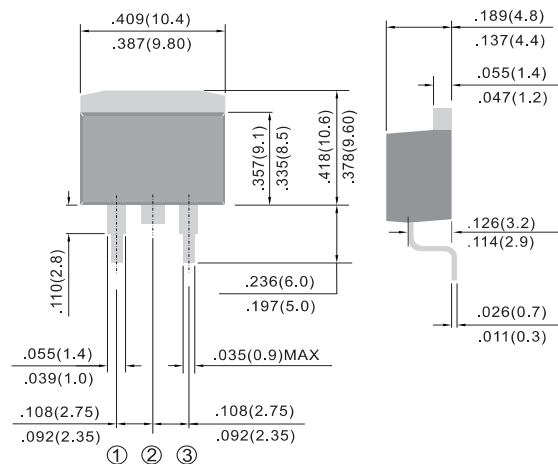
- Case: TO-263 Molded Plastic
- Terminals : Solderable per MIL-STD-750,Method 2026

### ORDERING INFORMATION

| TYPE     | MARKING | PACKAGE | PACKING     |
|----------|---------|---------|-------------|
| PJB24N10 | B24N10  | TO-263  | 800PCS/REEL |

### TO-263 / D<sup>2</sup>PAK

Unit: inch (mm)



### Maximum RATINGS and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted )

| PARAMETER                                                               | Symbol          | Limit       | Units |
|-------------------------------------------------------------------------|-----------------|-------------|-------|
| Drain-Source Voltage                                                    | $V_{DS}$        | 100         | V     |
| Gate-Source Voltage                                                     | $V_{GS}$        | ±20         | V     |
| Continuous Drain Current                                                | $I_D$           | 42          | A     |
| Pulsed Drain Current <sup>1)</sup>                                      | $I_{DM}$        | 160         | A     |
| Maximum Power Dissipation<br>Derating Factor                            | $P_D$           | 105<br>0.84 | W     |
| Operating Junction and Storage Temperature Range                        | $T_J, T_{STG}$  | -55 to +150 | °C    |
| Avalanche Energy with Single Pulse<br>$I_{AS}=17A, V_{DD}=80V, L=4.7mH$ | $E_{AS}$        | 680         | mJ    |
| Junction-to-Case Thermal Resistance                                     | $R_{\theta JC}$ | 1.2         | °C/W  |
| Junction-to Ambient Thermal Resistance                                  | $R_{\theta JA}$ | 62.5        | °C/W  |

Note: 1. Maximum DC current limited by the package

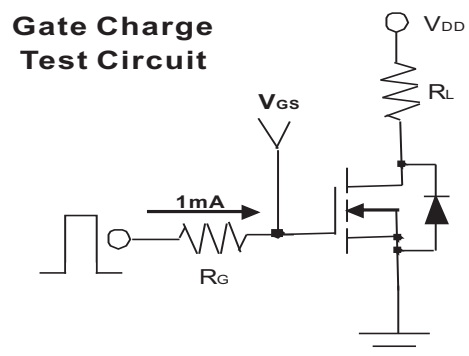
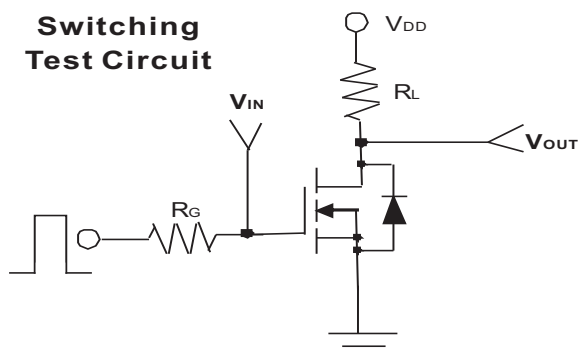
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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

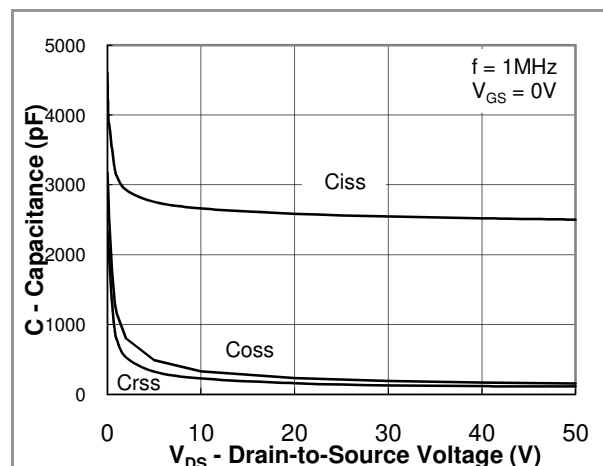
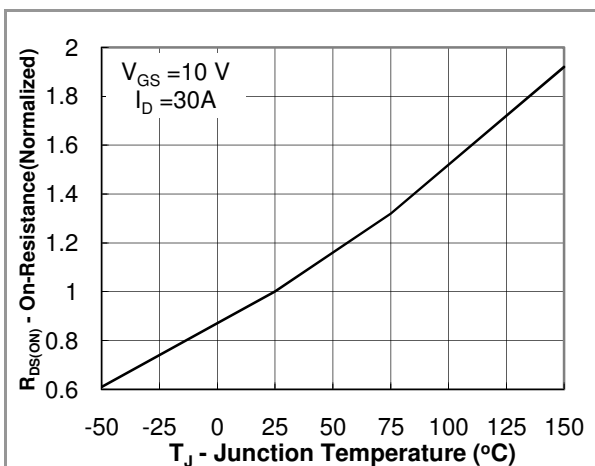
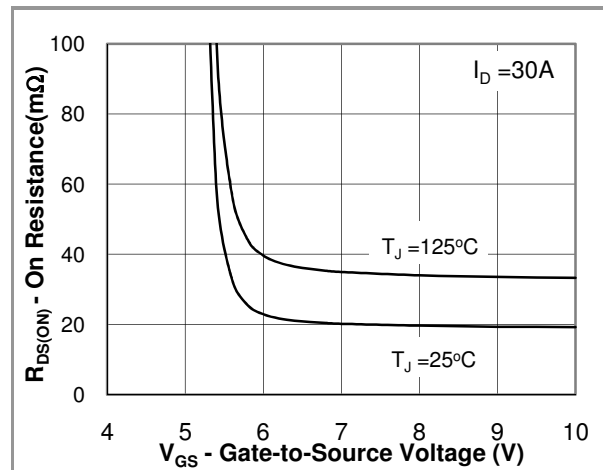
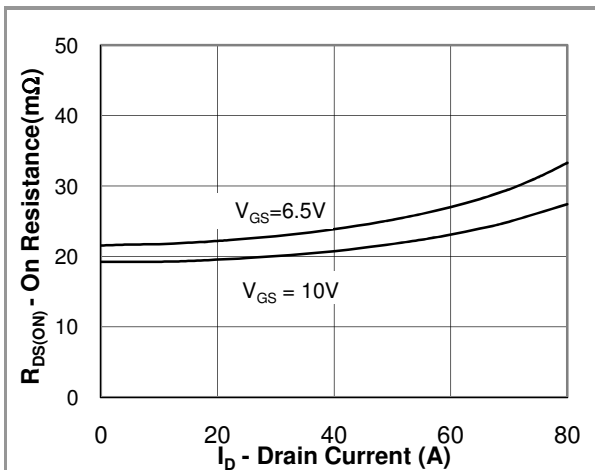
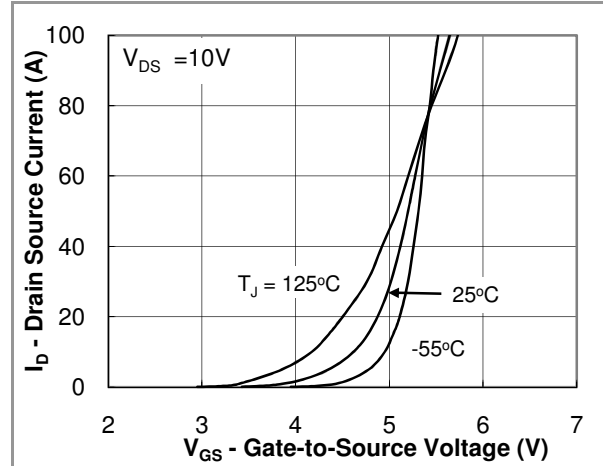
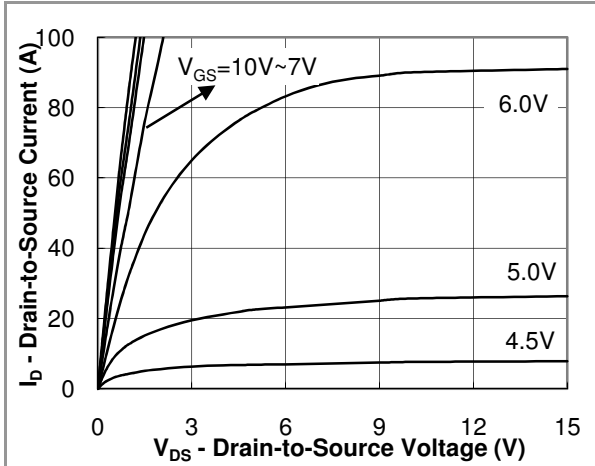
| Parameter                        | Symbol              | Test Condition                                                                         | Min. | Typ. | Max. | Units |
|----------------------------------|---------------------|----------------------------------------------------------------------------------------|------|------|------|-------|
| Static                           |                     |                                                                                        |      |      |      |       |
| Drain-Source Breakdown Voltage   | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                             | 100  | -    | -    | V     |
| Gate Threshold Voltage           | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                               | 2.0  | -    | 4.0  | V     |
| Drain-Source On-State Resistance | R <sub>DS(on)</sub> | V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A                                            | -    | 18.6 | 24   | mΩ    |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>    | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V                                              | -    | -    | 1    | uA    |
| Gate Body Leakage                | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                             | -    | -    | ±100 | nA    |
| Dynamic                          |                     |                                                                                        |      |      |      |       |
| Total Gate Charge                | Q <sub>g</sub>      | V <sub>DS</sub> =50V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V                     | -    | 60.6 | 78   | nC    |
| Gate-Source Charge               | Q <sub>gs</sub>     |                                                                                        | -    | 8.2  | -    |       |
| Gate-Drain Charge                | Q <sub>gd</sub>     |                                                                                        | -    | 21.4 | -    |       |
| Turn-On Delay Time               | t <sub>d(on)</sub>  | V <sub>DD</sub> =50V, I <sub>D</sub> =1A<br>V <sub>GS</sub> =10V, R <sub>G</sub> =1.6Ω | -    | 18.4 | 26   | ns    |
| Turn-On Rise Time                | t <sub>r</sub>      |                                                                                        | -    | 9.2  | 12   |       |
| Turn-Off Delay Time              | t <sub>d(off)</sub> |                                                                                        | -    | 56   | 68   |       |
| Turn-Off Fall Time               | t <sub>f</sub>      |                                                                                        | -    | 18.8 | 26   |       |
| Input Capacitance                | C <sub>iss</sub>    | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V<br>f=1.0MH <sub>z</sub>                      | -    | 1450 | 3200 | pF    |
| Output Capacitance               | C <sub>oss</sub>    |                                                                                        | -    | 155  | 200  |       |
| Reverse Transfer Capacitance     | C <sub>rss</sub>    |                                                                                        | -    | 110  | 165  |       |
| Source-Drain Diode               |                     |                                                                                        |      |      |      |       |
| Max. Diode Forward Current       | I <sub>S</sub>      | -                                                                                      | -    | -    | 42   | A     |
| Diode Forward Voltage            | V <sub>SD</sub>     | I <sub>S</sub> =30A , V <sub>GS</sub> =0V                                              | -    | -    | 1.3  | V     |

**NOTE:** Plus Test : Pluse Width ≤ 300us, Duty Cycle ≤ 2%.



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Typical Characteristics Curves (  $T_a=25^\circ\text{C}$ , unless otherwise noted)



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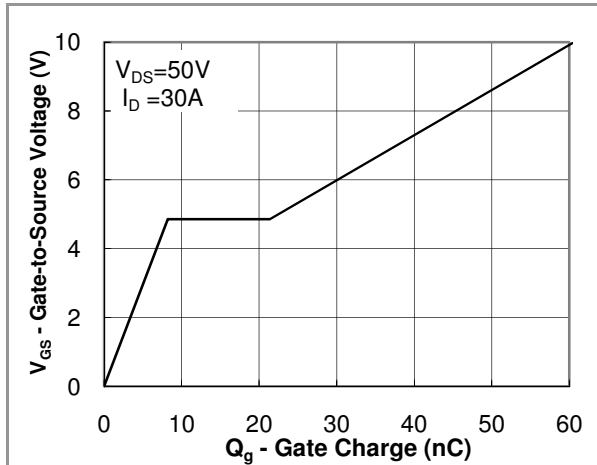


Fig. 7 Gate Charge Waveform

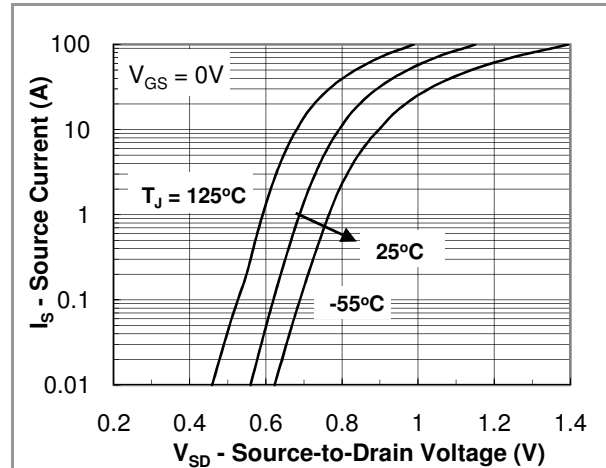


Fig. 8 Source-Drain Diode Forward Voltage

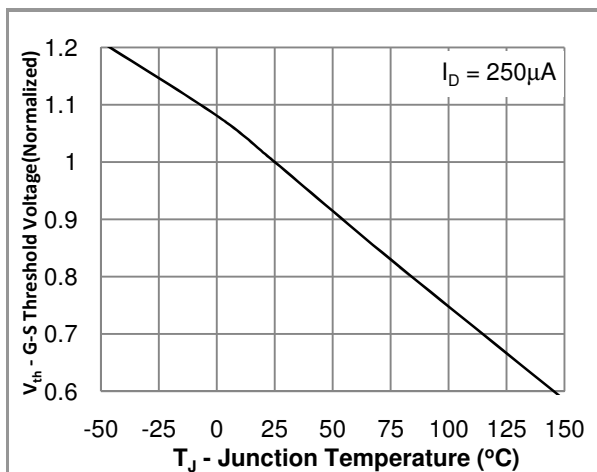


Fig. 9 Breakdown Voltage vs Junction Temperature



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