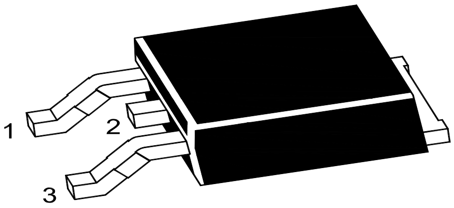
# PJM30H09NTE
## N-Channel Enhancement Mode Power MOSFET

### Features

- Fast switching
- Low gate charge and $R_{DS(on)}$
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- $V_{DS}$= 300V,$I_D$= 9A
  $R_{DS(on)}$< 0.55Ω @$V_{GS}$= 10V

### TO-252

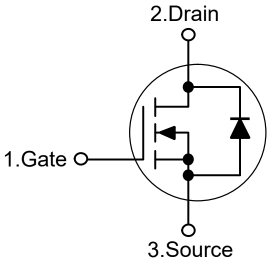


1. Gate 2.Drain 3.Sourse

### Applications

- Power switch circuit of adaptor and charger.

### Schematic Diagram



### Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 300 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | V |
| Drain Current-Continuous | $I_D$ | 9 | A |
| Drain Current-Pulsed Note1 | $I_{DM}$ | 36 | A |
| Single pulse avalanche energy Note4 | $E_{AS}$ | 420 | mJ |
| Avalanche energy, Repetitive Note1 | $E_{AR}$ | 9.8 | mJ |
| Avalanche Current Note1 | $I_{AR}$ | 9 | A |
| Maximum Power Dissipation | $P_D$ | 55 | W |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

### Thermal Characteristics

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient Note2 | $R_{\theta JA}$ | 62.5 | °C/W |
| Maximum Junction-to-Case Note2 | $R_{\theta JC}$ | 2.28 | °C/W |

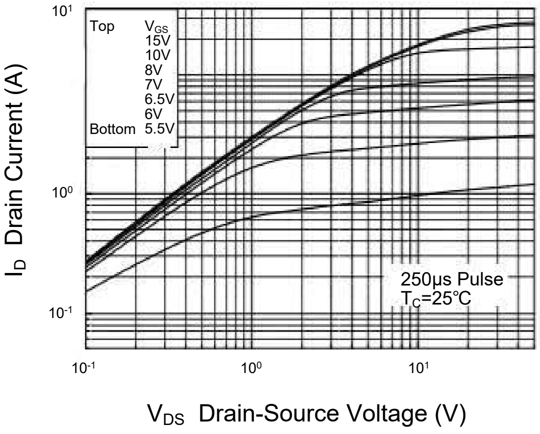
## Electrical Characteristics

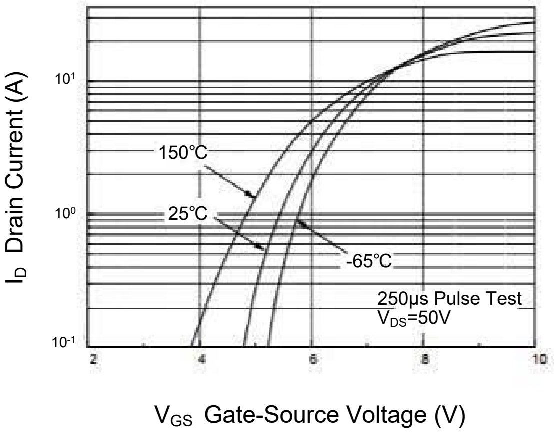
(Ta=25℃ unless otherwise specified)

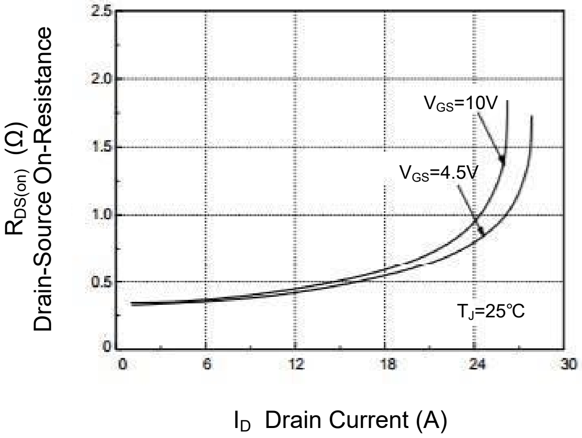
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 300 | -- | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=300V,$V_{GS}$=0V | -- | -- | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±30V,$V_{DS}$=0V | -- | -- | ±100 | nA |
| Gate Threshold Voltage Note3 | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 2 | -- | 4 | V |
| Drain-Source On-Resistance Note3 | $R_{DS(on)}$ | $V_{GS}$=10V,$I_D$=4.5A | -- | 0.4 | 0.55 | Ω |
| Forward Transconductance Note3 | $g_{FS}$ | $V_{DS}$=50V,$I_D$=4.5A | -- | 4.9 | -- | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V,f=1MHz | -- | 570 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 120 | -- | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 16 | -- | pF |
| **Switching Characteristics** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=150V, $I_D$=9A<br>$V_{GS}$=10V,$R_G$=25Ω | -- | 17 | -- | nS |
| Turn-on Rise Time | $t_r$ | | -- | 120 | -- | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 28 | -- | nS |
| Turn-off Fall Time | $t_f$ | | -- | 49 | -- | nS |
| Total Gate Charge | $Q_g$ | $V_{DD}$=150V,$I_D$=9A, $V_{GS}$=10V | -- | 15 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 3.5 | -- | nC |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 9 | -- | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage Note3 | $V_{SD}$ | $V_{GS}$=0V,$I_S$=9A | -- | -- | 1.5 | V |
| Diode Forward Current Note2 | $I_S$ | | -- | -- | 9 | A |

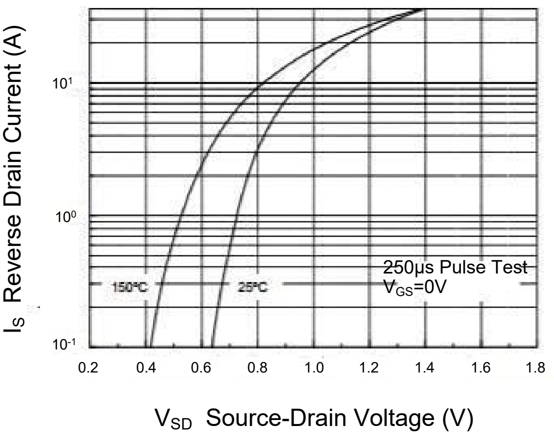
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse width≤380μs, duty cycle≤2%.
4. $E_{AS}$ condition : L=10mH, $I_D$=9.5A, Start $T_J$=25℃.

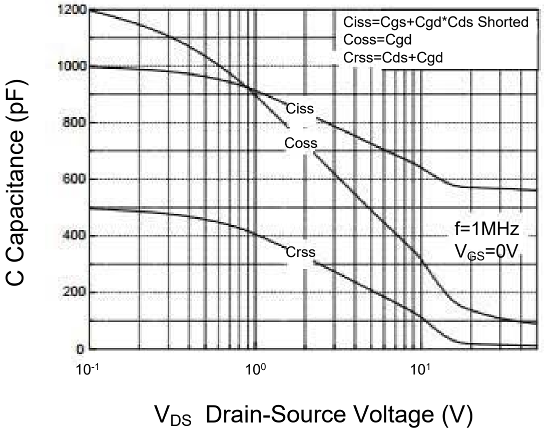
## Typical Characteristic Curves

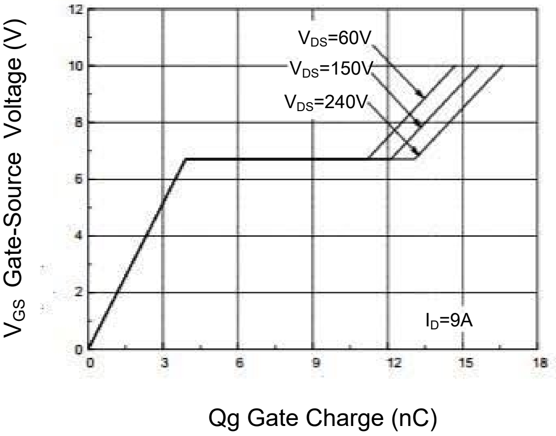


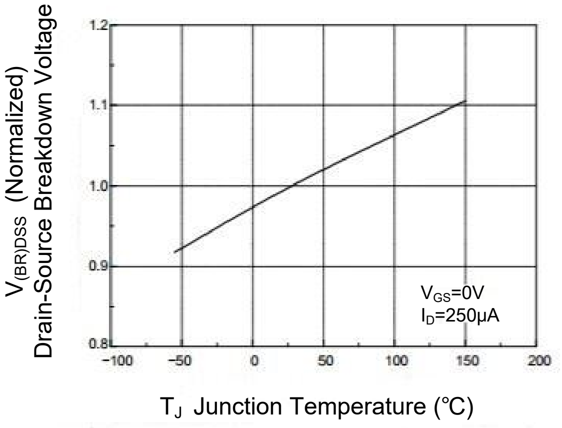


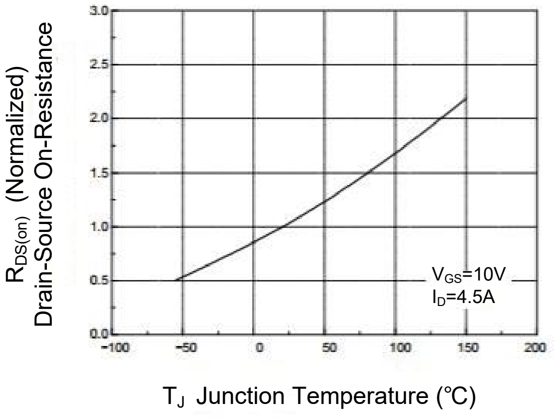


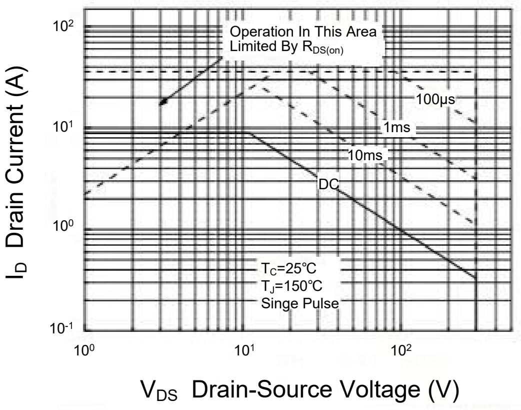


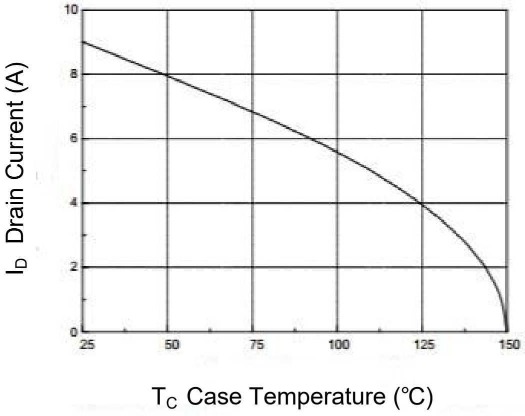


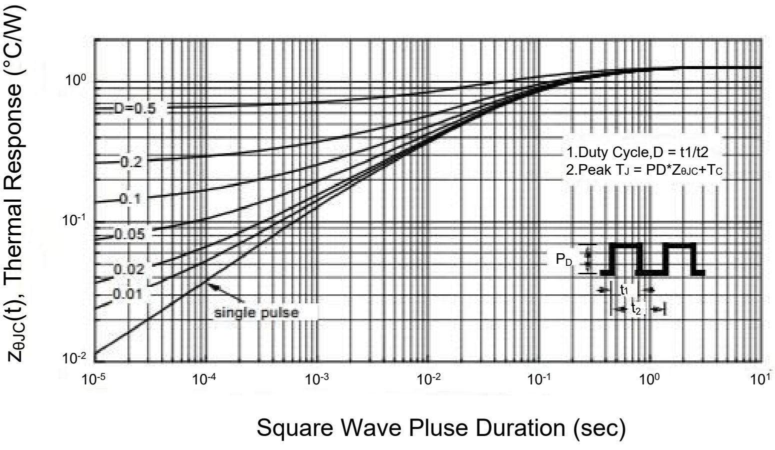



V(BR)DSS (Normalized)
Drain-Source Breakdown Voltage
1.2
1.1
1.0
0.9
0.8
−100
−50
0
50
100
150
200
VGS=0V
ID=250μA
TJ Junction Temperature (℃)


RDS(on) (Normalized)
Drain-Source On-Resistance
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−100
−50
0
50
100
150
200
VGS=10V
ID=4.5A
TJ Junction Temperature (℃)


ID Drain Current (A)
10²
10¹
10⁰
10⁻¹
10⁰
10¹
10²
Operation In This Area
Limited By RDS(on)
100μs
1ms
10ms
DC
TC=25℃
TJ=150℃
Singe Pulse
VDS Drain-Source Voltage (V)


ID Drain Current (A)
10
8
6
4
2
0
25
50
75
100
125
150
TC Case Temperature (℃)


ZθJC(t), Thermal Response (℃/W)
10⁰
10⁻¹
10⁻²
D=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
1.Duty Cycle,D = t1/t2
2.Peak TJ = PD*ZθJC+TC
PD
t1
t2
10⁻⁵
10⁻⁴
10⁻³
10⁻²
10⁻¹
10⁰
10¹
Square Wave Pluse Duration (sec)

**Package Outline**

TO-252
Dimensions in mm