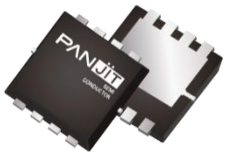
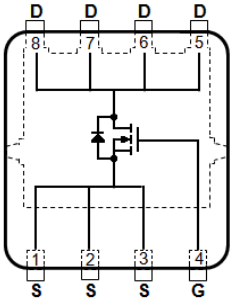
# PJQ4460AP

## 60V N-Channel Enhancement Mode MOSFET

| Voltage | 60 V | Current | 11 A |
|---|---|---|---|

**DFN3333-8L**






### Features

- $R_{DS(ON)}$, $V_{GS}$@10V, $I_D$@6A<72mΩ
- $R_{DS(ON)}$, $V_{GS}$@4.5V, $I_D$@3A<88mΩ
- Advanced Trench Process Technology
- High density cell design for ultra low on-resistance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : DFN3333-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.03 grams

### Maximum Ratings and Thermal Characteristics ($T_A$=25°C unless otherwise noted)

| PARAMETER | | SYMBOL | LIMIT | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current(Note 4) | $T_C$=25°C | $I_D$ | 11 | A |
| | $T_C$=100°C | | 7 | |
| Pulsed Drain Current(Note 1) | $T_C$=25°C | $I_{DM}$ | 44 | |
| Power Dissipation | $T_C$=25°C | $P_D$ | 20 | W |
| | $T_C$=100°C | | 8 | |
| Continuous Drain Current(Note 4) | $T_A$=25°C | $I_D$ | 3.7 | A |
| | $T_A$=70°C | | 2.9 | |
| Power Dissipation | $T_A$=25°C | $P_D$ | 2 | W |
| | $T_A$=70°C | | 1.3 | |
| Single Pulse Avalanche Energy(Note 6) | | $E_{AS}$ | 25 | mJ |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55~150 | °C |
| Typical Thermal Resistance(Note 4,5) | Junction to Case | $R_{\theta JC}$ | 6.3 | °C/W |
| | Junction to Ambient | $R_{\theta JA}$ | 62.5 | |

- Limited only By Maximum Junction Temperature

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## Electrical Characteristics ($T_A$=25°C unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250uA | 60 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 1 | 1.8 | 2.5 | |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=6A | - | 53 | 72 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=3A | - | 61 | 88 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V, $V_{GS}$=0V | - | - | 1 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| **Dynamic**(Note 7) | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=48V, $I_D$=6A, $V_{GS}$=10V(Note 1,2) | - | 9.3 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 2.2 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.9 | - | |
| Input Capacitance | Ciss | $V_{DS}$=15V, $V_{GS}$=0V, f=1MHZ | - | 509 | - | pF |
| Output Capacitance | Coss | | - | 47 | - | |
| Reverse Transfer Capacitance | Crss | | - | 23 | - | |
| Turn-On Delay Time | $td_{(on)}$ | $V_{DD}$=30V, $I_D$=1A, $V_{GS}$=10V, $R_G$=3.3Ω(Note 1,2) | - | 3.2 | - | ns |
| Turn-On Rise Time | $t_r$ | | - | 9.7 | - | |
| Turn-Off Delay Time | $td_{(off)}$ | | - | 18.5 | - | |
| Turn-Off Fall Time | $t_f$ | | - | 6.4 | - | |
| **Drain-Source Diode** | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$ | --- | - | - | 11 | A |
| Reverse Recovery Time | $V_{SD}$ | $I_S$=1A, $V_{GS}$=0V | - | 0.75 | 1 | V |

NOTES :

1. Pulse width≤300us, Duty cycle≤2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial $T_J$ =25°C.
4. The maximum current rating is package limited.
5. $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch$^2$ with 2oz.square pad of copper.
6. The test condition is L=1mH, $I_{AS}$=7A, $V_{DD}$=25V, $V_{GS}$=10V, Starting $T_J$=25°C.
7. Guaranteed by design, not subject to production testing.

# PJQ4460AP

## TYPICAL CHARACTERISTIC CURVES

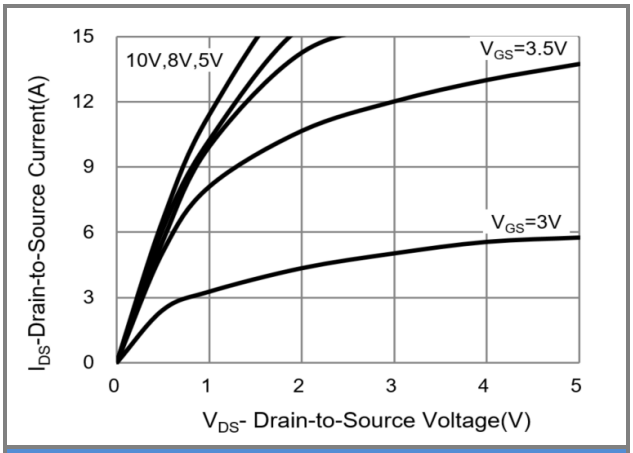


Fig.1 On-Region Characteristics

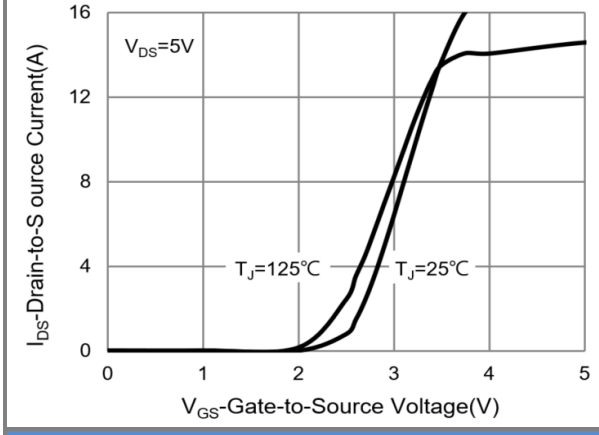


Fig.2 Transfer Characteristics

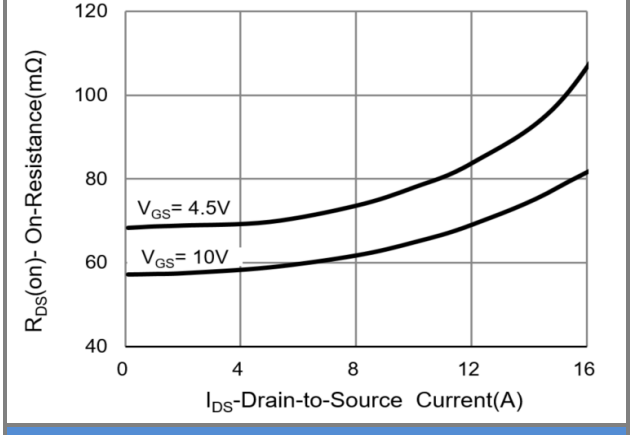


Fig.3 On-Resistance vs. Drain Current

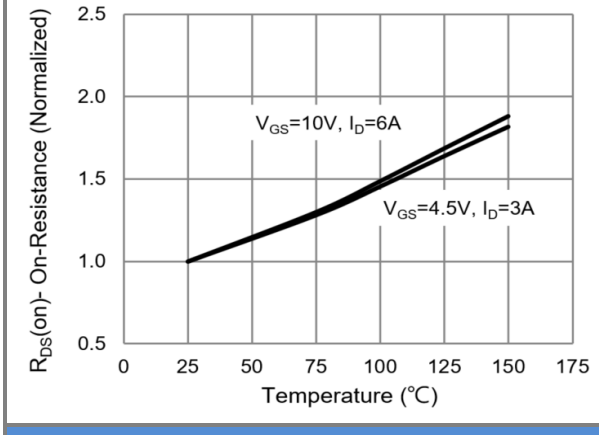


Fig.4 On-Resistance vs. Junction temperature

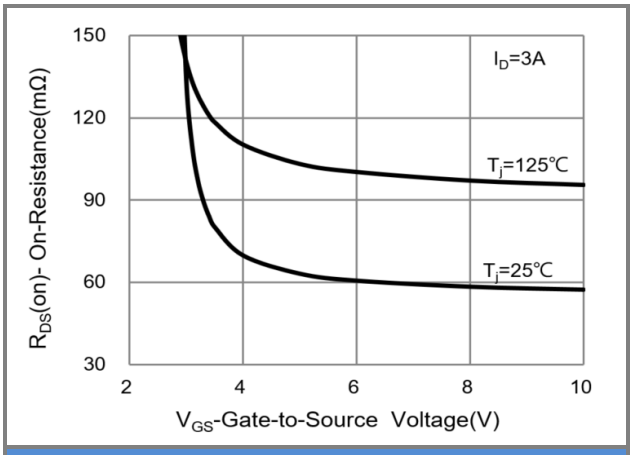


Fig.5 On-Resistance Variation with $V_{GS}$

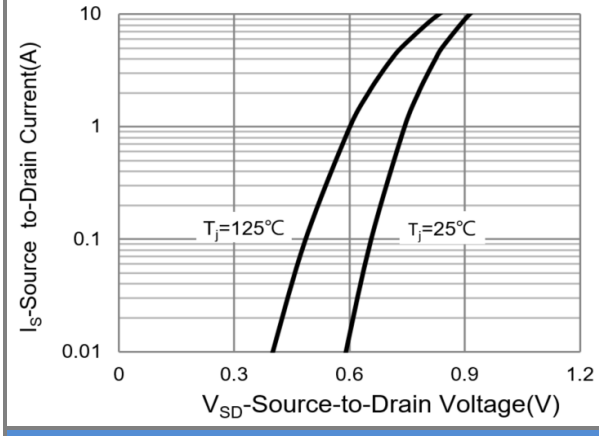


Fig.6 Source-Drain Diode Forward Voltage

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## TYPICAL CHARACTERISTIC CURVES

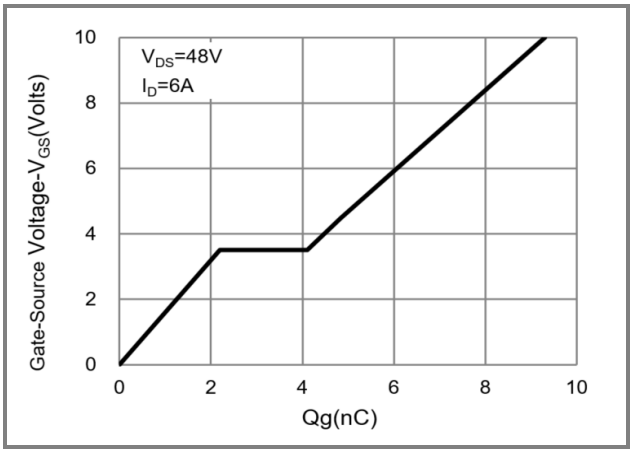



Fig.7 Gate-Charge Characteristics

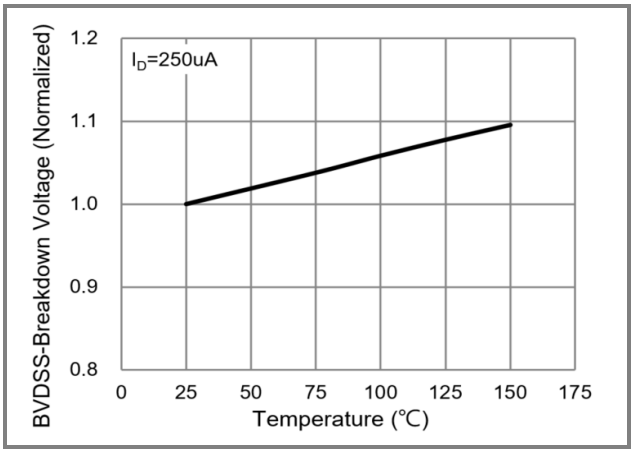



Fig.8 Breakdown Voltage Variation vs. Temperature

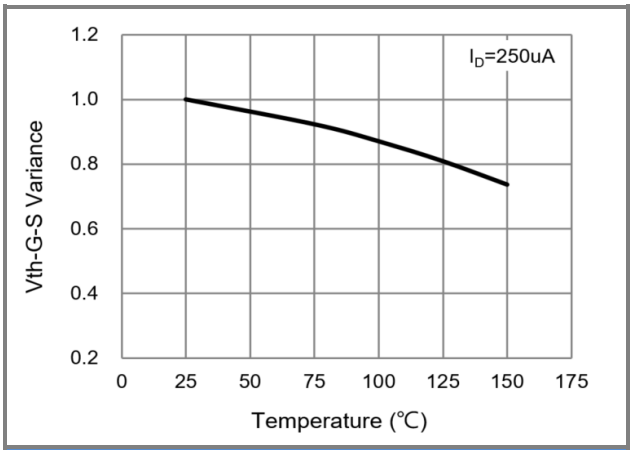



Fig.9 Threshold Voltage Variation with Temperature

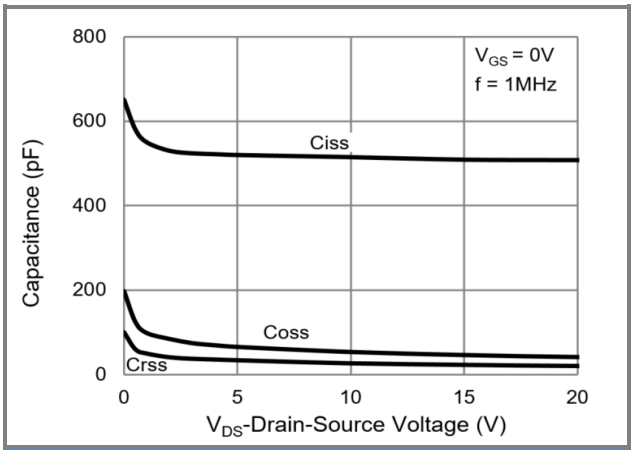



Fig.10 Capacitance vs. Drain-Source Voltage

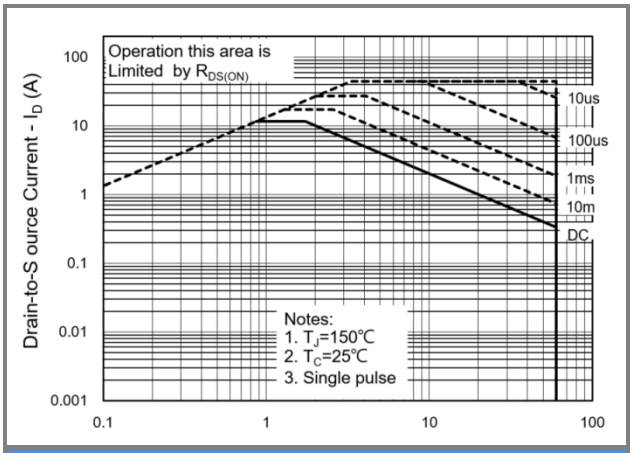



Fig.11 Maximum Safe Operating Area

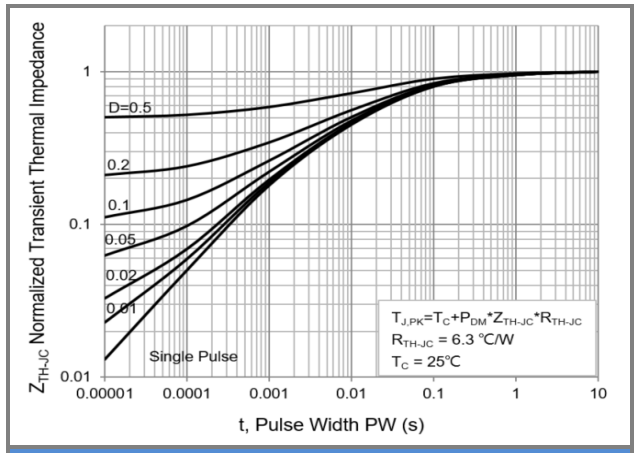



Fig.12 Normalized Transient Thermal Impedance

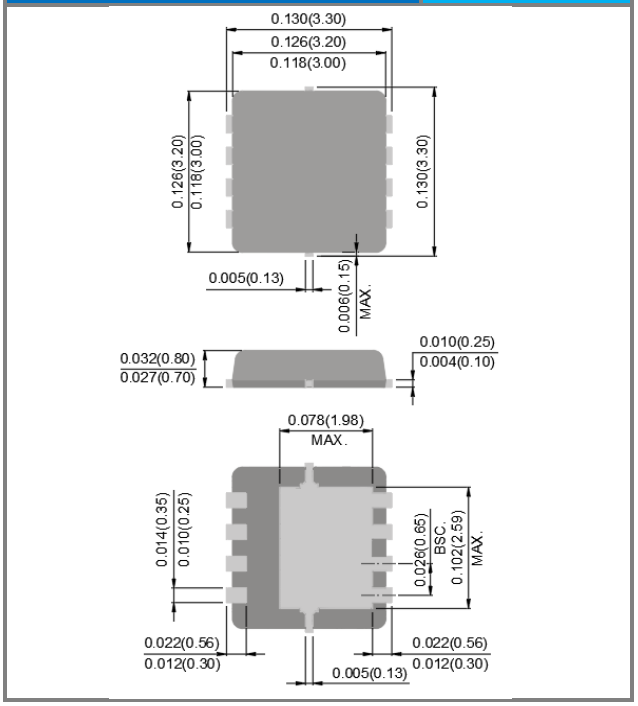
# PJQ4460AP

## Part No. Packing Code Version

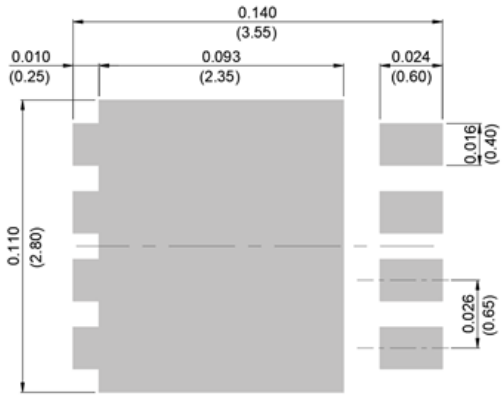
| Part No. Packing Code | Package Type | Packing Type | Marking | Version |
|---|---|---|---|---|
| PJQ4460AP_R2_00001 | DFN3333-8L | 5K pcs / 13” reel | 4460 | Halogen free RoHS compliant |

## Packaging Information & Mounting Pad Layout

DFN3333-8L Dimension — Unit: inch(mm)




DFN3333-8L Pad Layout — Unit: inch(mm)



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