

# PJQ4465AP-AU

## 60V P-Channel Enhancement Mode MOSFET

**Voltage** -60 V **Current** -15 A

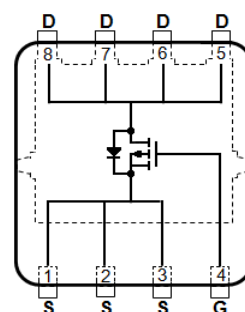
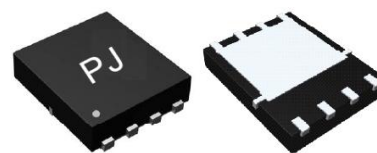
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-5A < 48m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-3A < 65m\Omega$
- High switching speed
- Low Gate Charge
- Low reverse transfer capacitance
- AEC-Q101 qualified
- 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 : 0.001 ounces, 0.03 grams

DFN3333-8L



## Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ 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)                | $T_C=25^\circ\text{C}$  | $I_D$           | -15     | A                  |
|                                                  | $T_C=100^\circ\text{C}$ |                 | -10     |                    |
| Pulsed Drain Current (Note 1)                    | $T_C=25^\circ\text{C}$  | $I_{DM}$        | -60     |                    |
| Power Dissipation                                | $T_C=25^\circ\text{C}$  | $P_D$           | 20      | W                  |
|                                                  | $T_C=100^\circ\text{C}$ |                 | 8       |                    |
| Continuous Drain Current (Note 4)                | $T_A=25^\circ\text{C}$  | $I_D$           | -5      | A                  |
|                                                  | $T_A=70^\circ\text{C}$  |                 | -4      |                    |
| Power Dissipation                                | $T_A=25^\circ\text{C}$  | $P_D$           | 2       | W                  |
|                                                  | $T_A=70^\circ\text{C}$  |                 | 1.3     |                    |
| Single Pulse Avalanche Energy (Note 6)           |                         | $E_{AS}$        | 51      | mJ                 |
| Operating Junction and Storage Temperature Range |                         | $T_J, T_{STG}$  | -55~150 | $^\circ\text{C}$   |
| Typical Thermal Resistance (Note 4,5)            | Junction to Case        | $R_{\theta JC}$ | 6.3     | $^\circ\text{C/W}$ |
|                                                  | Junction to Ambient     | $R_{\theta JA}$ | 62.5    |                    |

- Limited only By Maximum Junction Temperature



## PJQ4465AP-AU

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ 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                                                            | -60  | -    | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                                              | -1   | -1.7 | -2.5 |       |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A                                                             | -    | 40   | 48   | mΩ    |
|                                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A                                                            | -    | 55   | 65   |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V                                                             | -    | -    | -1   | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                             | -    | -    | ±100 | nA    |
| Dynamic (Note 7)                                      |                     |                                                                                                        |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-30V, I <sub>D</sub> =-5A,<br>V <sub>GS</sub> =-10V (Note 2,3)                        | -    | 22   | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                        | -    | 4.1  | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                        | -    | 5.2  | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V,<br>f=1MHZ                                                  | -    | 1256 | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                        | -    | 87   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                        | -    | 59   | -    |       |
| Turn-On Delay Time                                    | td <sub>(on)</sub>  | V <sub>DD</sub> =-30V, I <sub>D</sub> =-1A,<br>V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω<br>(Note 2,3) | -    | 13   | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |                                                                                                        | -    | 42   | -    |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                        | -    | 65   | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |                                                                                                        | -    | 16   | -    |       |
| Drain-Source Diode                                    |                     |                                                                                                        |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---                                                                                                    | -    | -    | -15  | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V                                                               | -    | -0.7 | -1   | V     |

#### NOTES :

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^{\circ}\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^{\circ}\text{C}$ .
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<sup>2</sup> with 2oz.square pad of copper.
6.  $L=0.1\text{mH}$ ,  $I_{AS}=-32A$ ,  $V_{GS}=-10V$ ,  $V_{DS}=-25V$ ,  $R_G=25\text{ ohm}$ .
7. Guaranteed by design, not subject to production testing.

# PJQ4465AP-AU

## TYPICAL CHARACTERISTIC CURVES

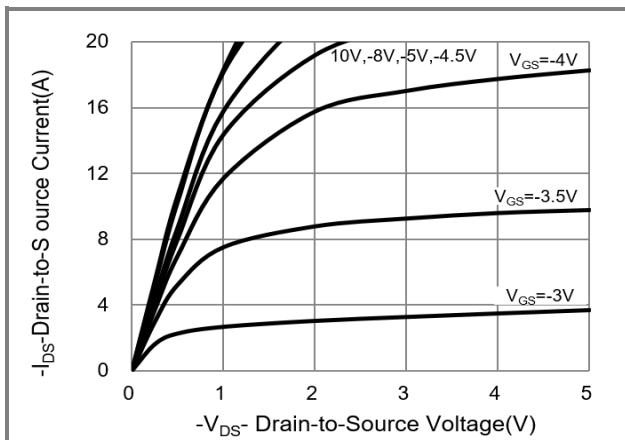


Fig.1 On-Region Characteristics

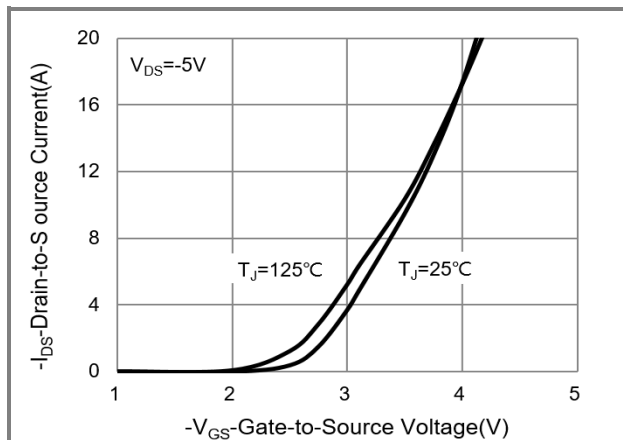


Fig.2 Transfer Characteristics

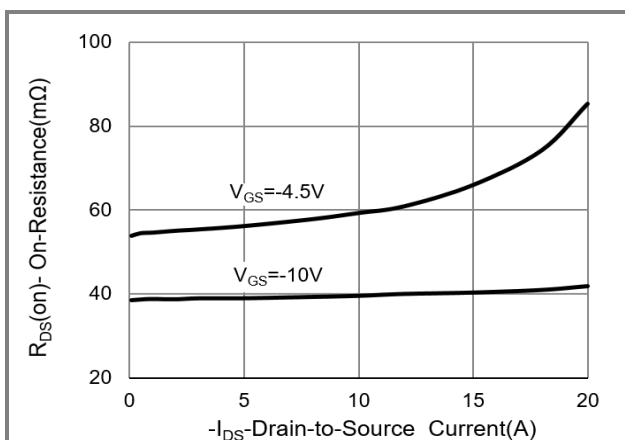


Fig.3 On-Resistance vs. Drain Current

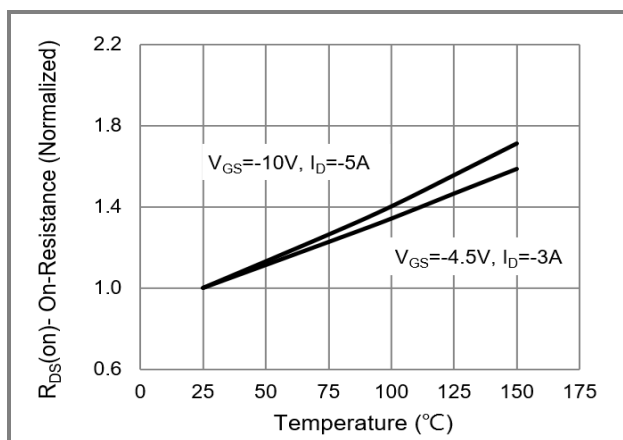


Fig.4 On-Resistance vs. Junction temperature

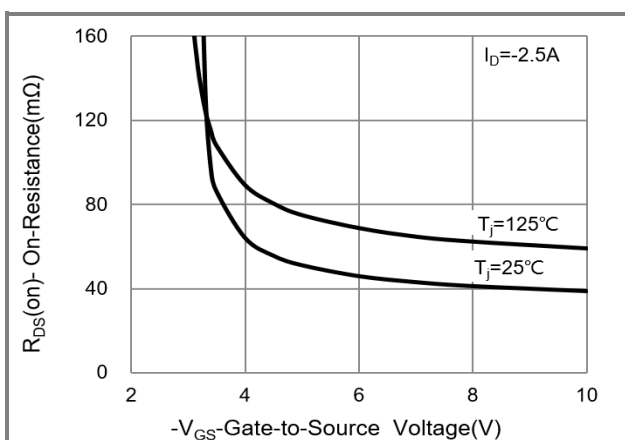


Fig.5 On-Resistance Variation with  $V_{GS}$

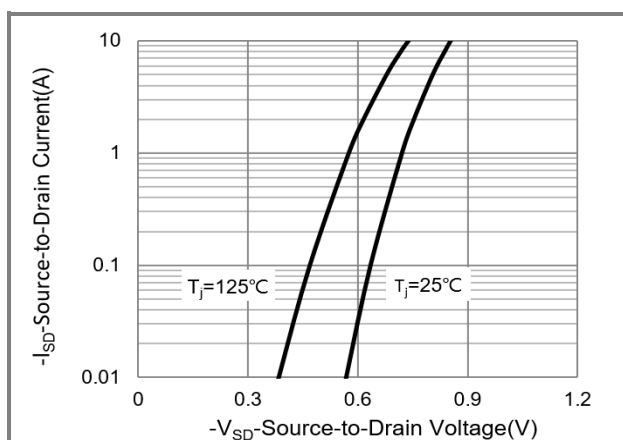
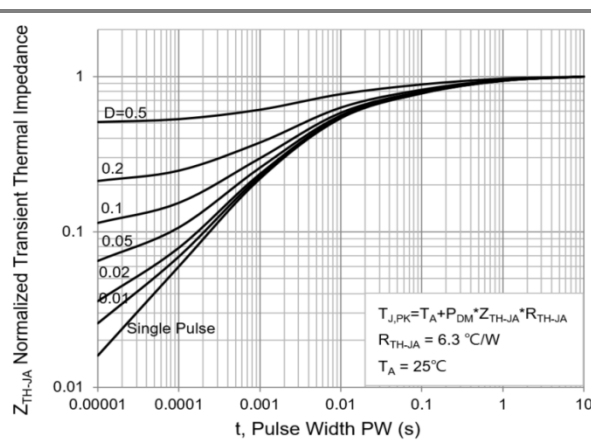
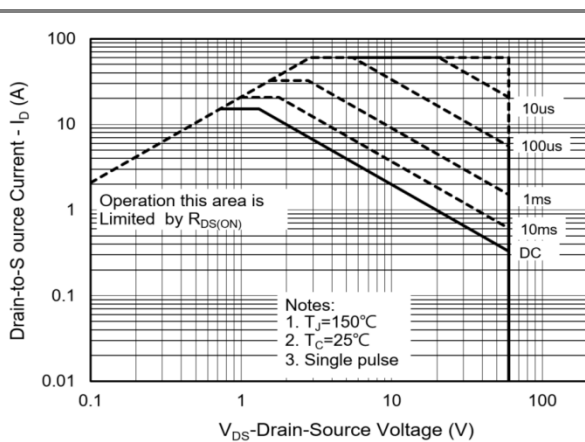
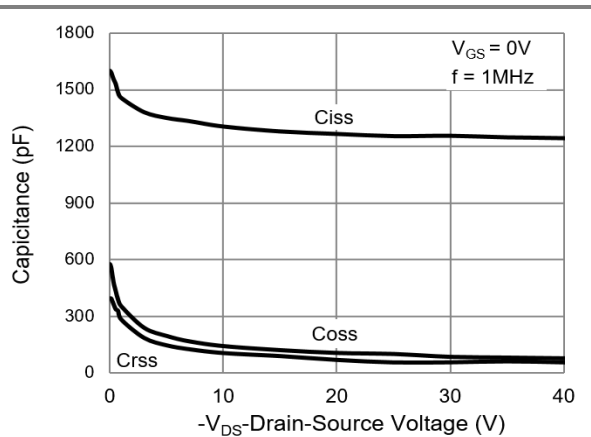
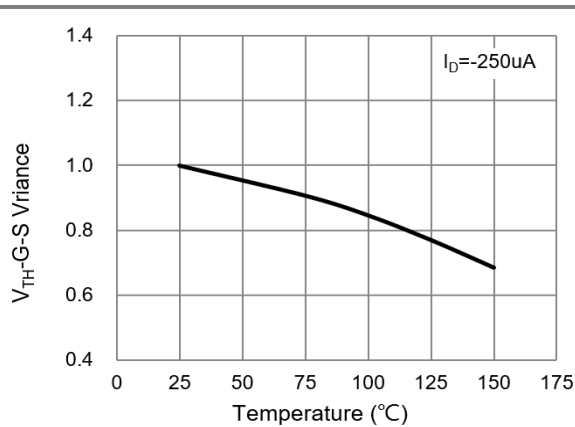
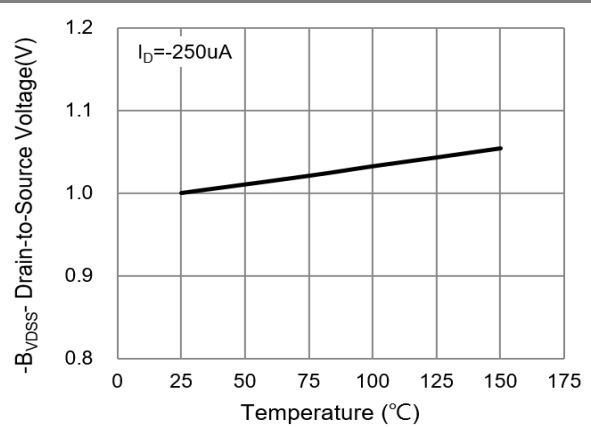
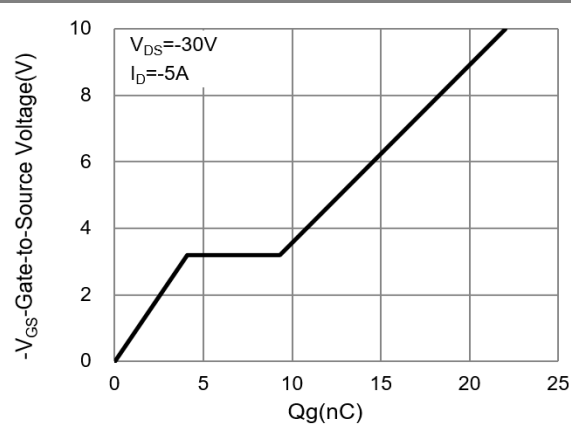


Fig.6 Source-Drain Diode Forward Voltage

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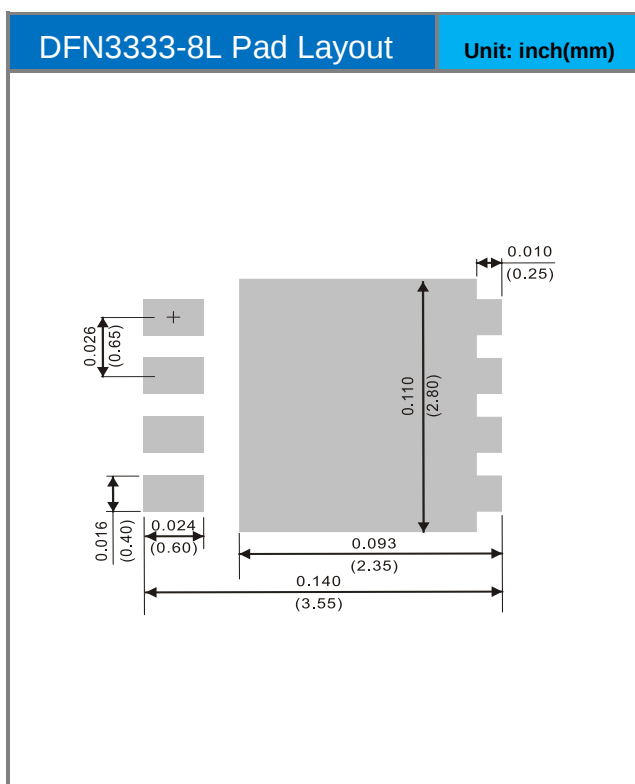
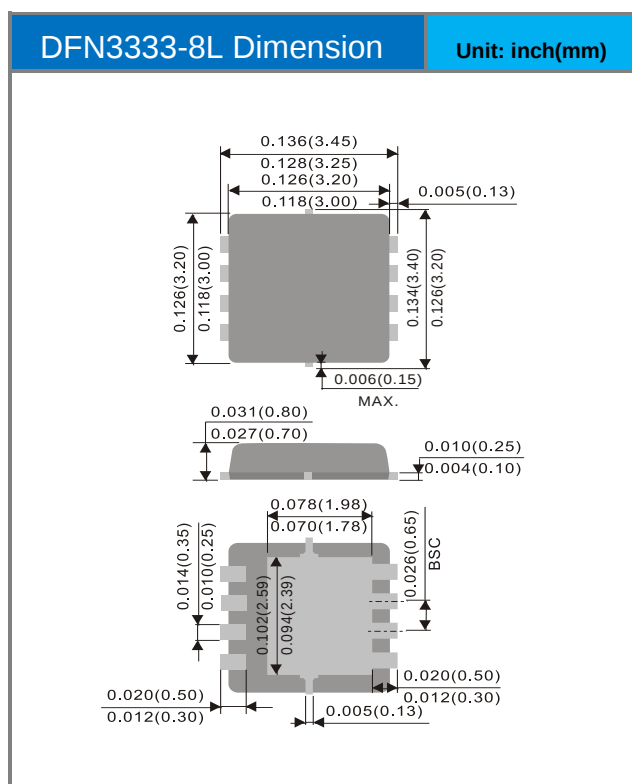


# PJQ4465AP-AU

## Part No Packing Code Version

| Part No Packing Code  | Package Type | Packing Type      | Marking | Version      |
|-----------------------|--------------|-------------------|---------|--------------|
| PJQ4465AP-AU_R2_000A1 | DFN3333-8L   | 5K pcs / 13" reel | 4465    | Halogen free |

## Packaging Information & Mounting Pad Layout





## PJQ4465AP-AU

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