



# PJQ5419

## 30V P-Channel Enhancement Mode MOSFET

**Voltage**

**-30 V**

**Current**

**-30A**

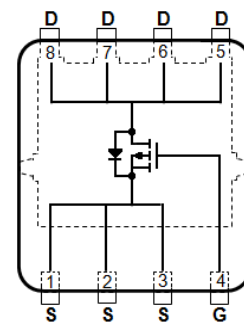
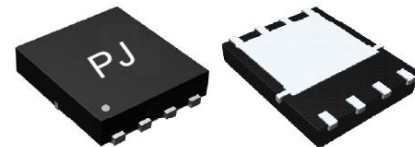
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V, I_D@-8A < 20m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V, I_D@-6A < 32m\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: DFN5060-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0028 ounces, 0.08 grams

DFN5060-8L



### Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER  |                         | SYMBOL          | LIMIT   | UNITS              |
|--|-------------------------|-----------------|---------|--------------------|
| Drain-Source Voltage                             |                         | $V_{DS}$        | -30     | V                  |
| Gate-Source Voltage                              |                         | $V_{GS}$        | +20     | V                  |
| Continuous Drain Current                         | $T_C=25^\circ\text{C}$  | $I_D$           | -30     | A                  |
|  | $T_C=100^\circ\text{C}$ |                 | -19     |                    |
| Pulsed Drain Current <sup>(Note 1)</sup>         | $T_C=25^\circ\text{C}$  | $I_{DM}$        | -120    |                    |
| Power Dissipation                                | $T_C=25^\circ\text{C}$  | $P_D$           | 27      | W                  |
|  | $T_C=100^\circ\text{C}$ |                 | 11      |                    |
| Continuous Drain Current                         | $T_A=25^\circ\text{C}$  | $I_D$           | -8.5    | A                  |
|  | $T_A=70^\circ\text{C}$  |                 | -6.9    |                    |
| Power Dissipation                                | $T_A=25^\circ\text{C}$  | $P_D$           | 2.0     | W                  |
| Power Dissipation                                | $T_A=70^\circ\text{C}$  |                 | 1.3     |                    |
| Operating Junction and Storage Temperature Range |                         | $T_J, T_{STG}$  | -55~150 | $^\circ\text{C}$   |
| Typical Thermal Resistance <sup>(Note 4,5)</sup> | Junction to Case        | $R_{\theta JC}$ | 4.6     | $^\circ\text{C/W}$ |
|  | Junction to Ambient     | $R_{\theta JA}$ | 62.5    |                    |

- Limited only By Maximum Junction Temperature



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

| PARAMETER   | SYMBOL              | TEST CONDITION   | MIN. | TYP.  | MAX. | UNITS |
|---|---------------------|--|------|-------|------|-------|
| <b>Static</b>   |                     |  |      |       |      |       |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA  | -30  | -     | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA  | -1   | -1.5  | -2.5 |       |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A   | -    | 17    | 20   | mΩ    |
|   |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A  | -    | 26    | 32   |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V   | -    | -     | -1.0 | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   | -    | -     | ±100 | nA    |
| <b>Dynamic</b> (Note 6)                               |                     |  |      |       |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-15V, I <sub>D</sub> =-5A,<br>V <sub>GS</sub> =-4.5V (Note 1,2)                       | -    | 11    | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |  | -    | 3.2   | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |  | -    | 3.9   | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V,<br>f=1.0MHZ  | -    | 1169  | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |  | -    | 180   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |  | -    | 132   | -    |       |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DS</sub> =-15V, I <sub>D</sub> =-1A,<br>V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω<br>(Note 1,2) | -    | 5.9   | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |  | -    | 33    | -    |       |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |  | -    | 55    | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |  | -    | 34    | -    |       |
| <b>Drain-Source Diode</b>                             |                     |  |      |       |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---  | -    | -     | -30  | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V   | -    | -0.73 | -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<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub>=25°C.
4. The maximum current rating is package limited
5. R<sub>θJA</sub> 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. Guaranteed by design, not subject to production testing



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## TYPICAL CHARACTERISTIC CURVES

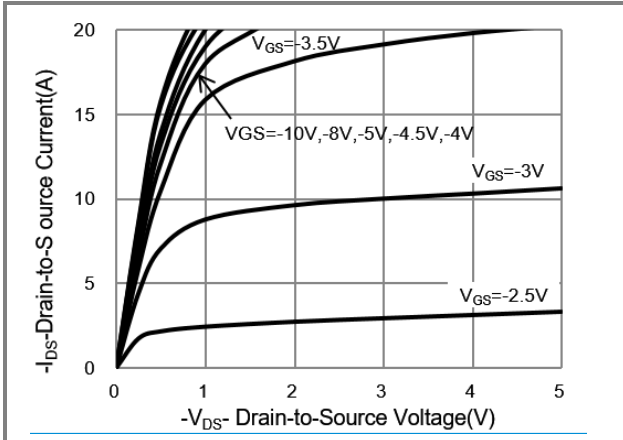


Fig.1 On-Region Characteristics

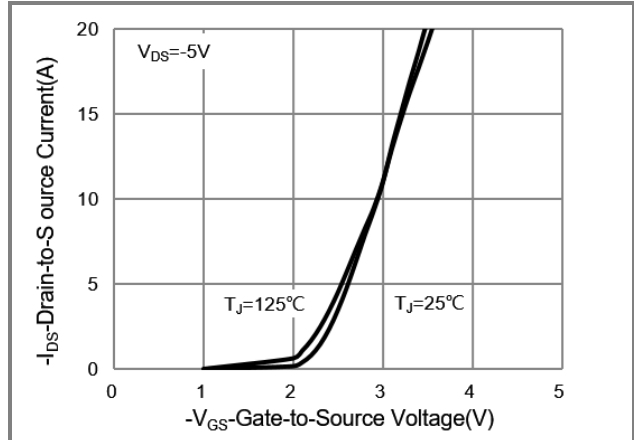


Fig.2 Transfer Characteristics

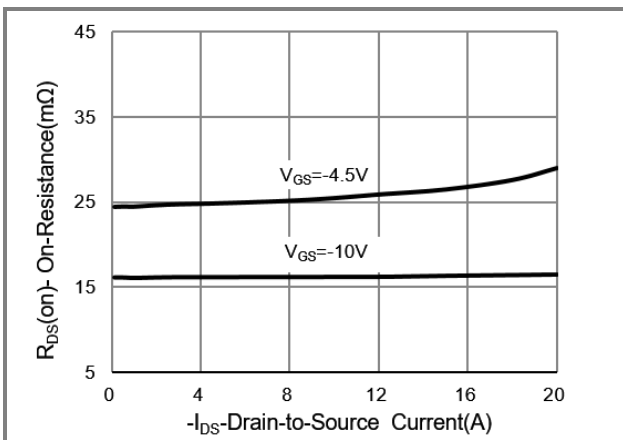


Fig.3 On-Resistance vs. Drain Current

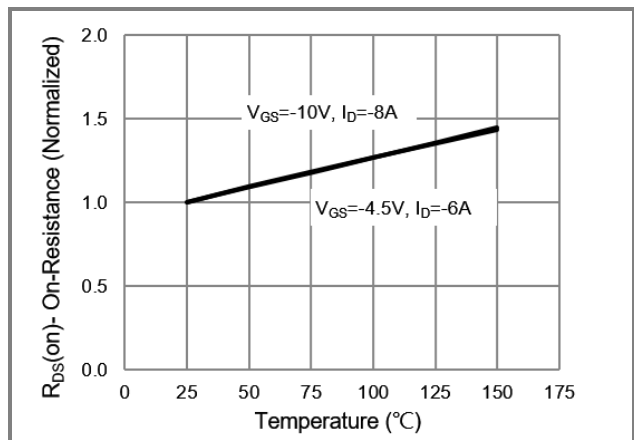


Fig.4 On-Resistance vs. Junction temperature

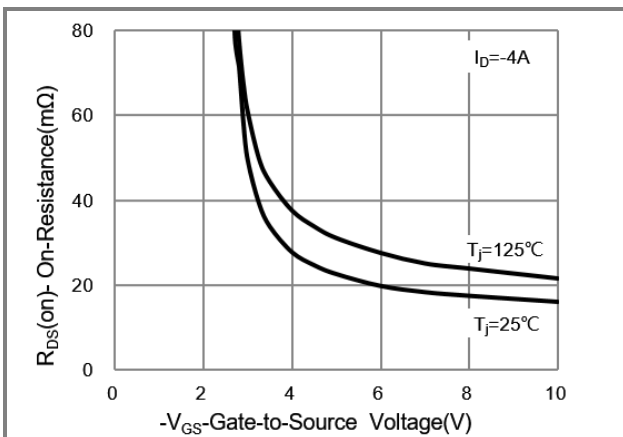


Fig.5 On-Resistance Variation with V\_GS.

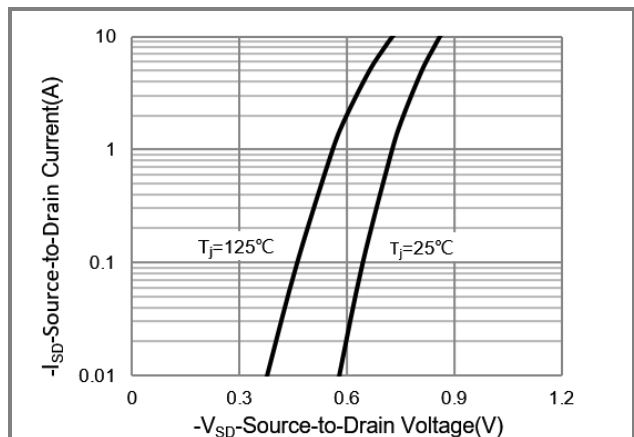


Fig.6 Body Diode Characteristics



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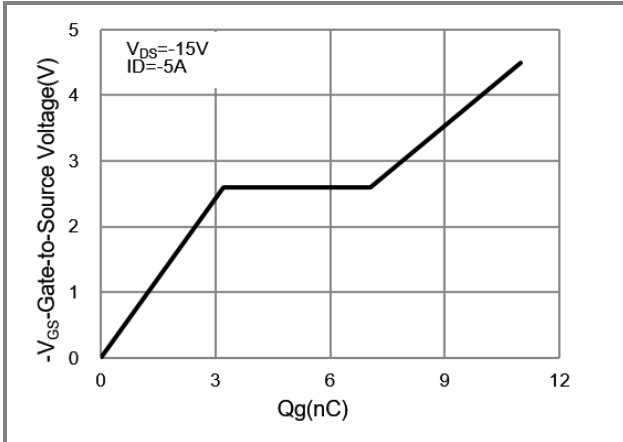


Fig.7 Gate-Charge Characteristics

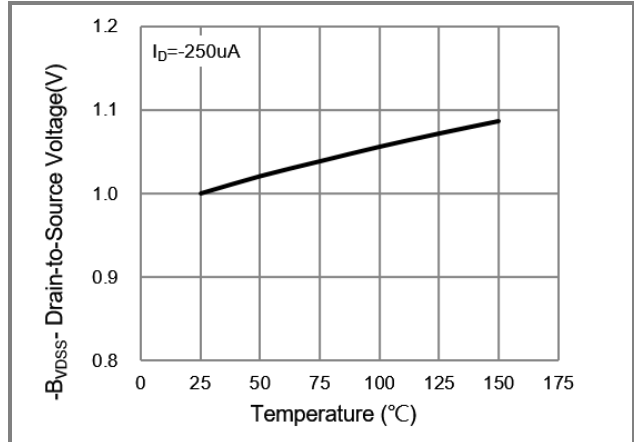


Fig.8 Breakdown Voltage Variation vs. Temperature

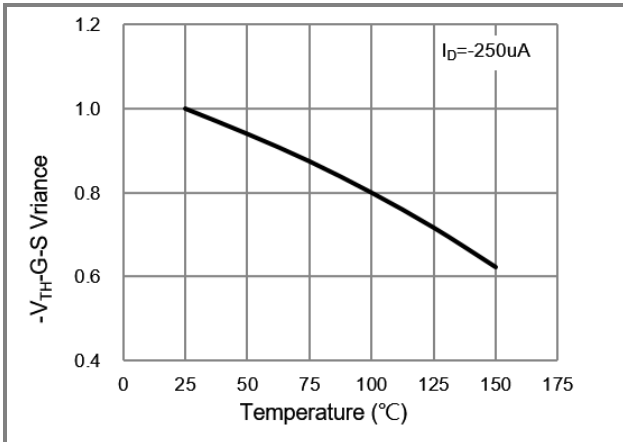


Fig.9 Threshold Voltage Variation with Temperature.

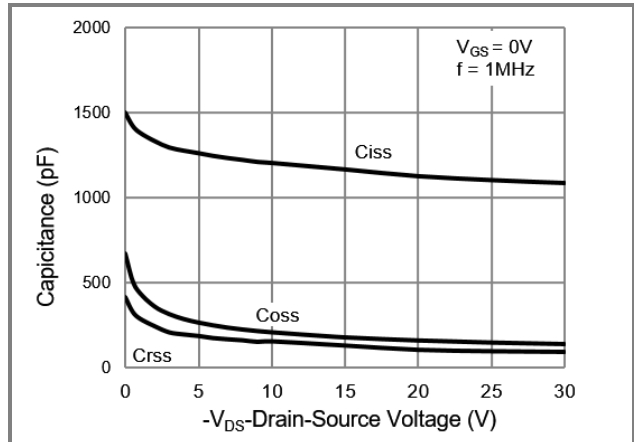


Fig.10 Capacitance vs. Drain-Source Voltage.

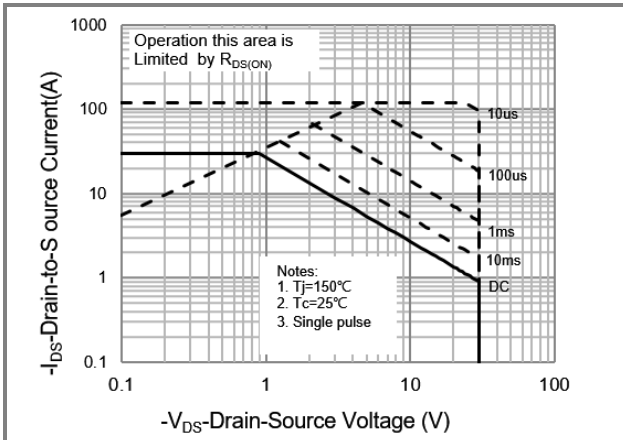


Fig.11 Maximum Safe Operating Area



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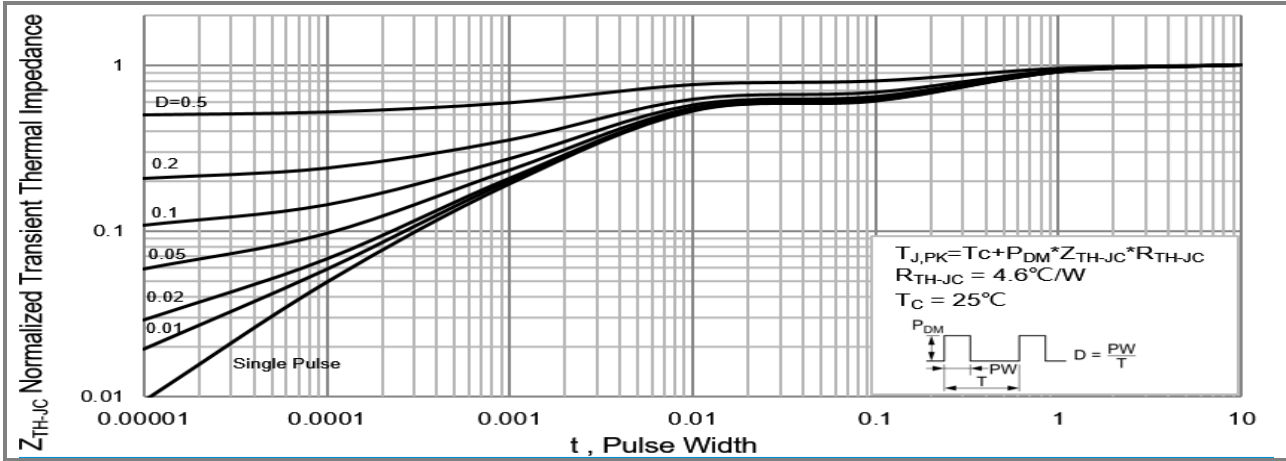


Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width

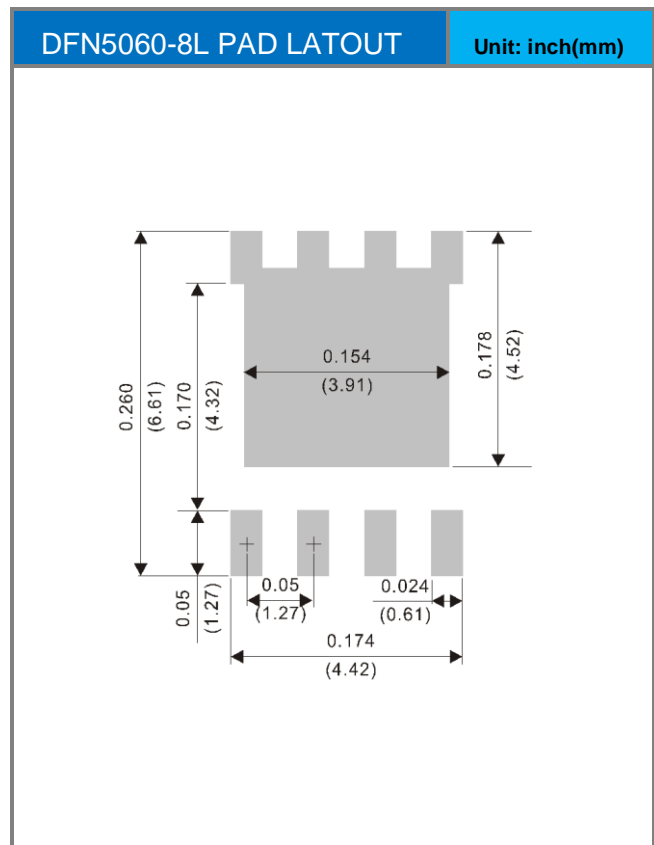
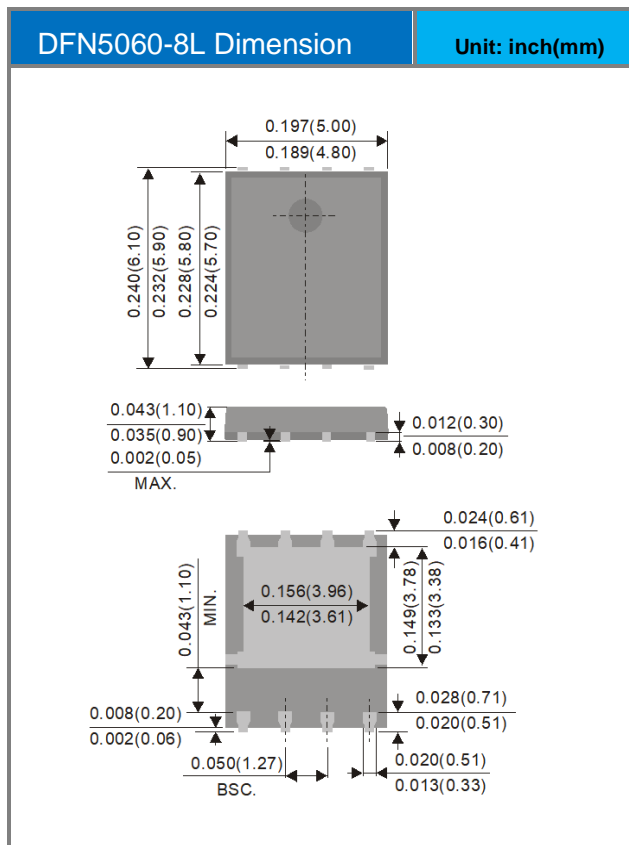


# PJQ5419

## Part No Packing Code Version

| Part No Packing Code | Package Type | Packing Type       | Marking | Version      |
|----------------------|--------------|--------------------|---------|--------------|
| PJQ5419_R2_00001     | DFN5060-8L   | 3000pcs / 13" reel | Q5419   | Halogen free |

## Packaging Information & Mounting Pad Layout





## PJQ5419

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