

# PJQ5423-AU

## 30V P-Channel Enhancement Mode MOSFET

**Voltage**

**-30 V**

**Current**

**-60 A**

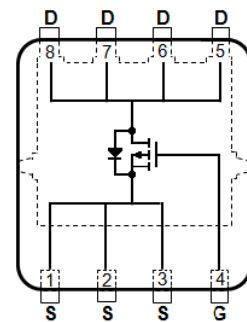
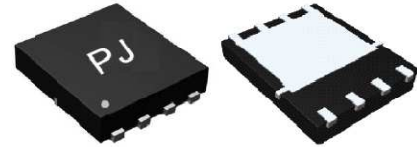
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V, I_D@-10A < 8.5m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V, I_D@-8A < 14m\Omega$
- 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 ( $T_A=25^{\circ}C$ unless otherwise noted)

| PARAMETER                                        |                     | SYMBOL          | LIMIT   | UNITS         |
|--------------------------------------------------|---------------------|-----------------|---------|---------------|
| Drain-Source Voltage                             |                     | $V_{DS}$        | -30     | V             |
| Gate-Source Voltage                              |                     | $V_{GS}$        | +20     | V             |
| Continuous Drain Current <sup>(Note 4)</sup>     | $T_C=25^{\circ}C$   | $I_D$           | -60     | A             |
|                                                  | $T_C=100^{\circ}C$  |                 | -38     |               |
| Pulsed Drain Current <sup>(Note 1)</sup>         | $T_C=25^{\circ}C$   | $I_{DM}$        | -240    |               |
| Power Dissipation                                | $T_C=25^{\circ}C$   | $P_D$           | 63      | W             |
|                                                  | $T_C=100^{\circ}C$  |                 | 25      |               |
| Continuous Drain Current <sup>(Note 4)</sup>     | $T_A=25^{\circ}C$   | $I_D$           | -11     | A             |
|                                                  | $T_A=70^{\circ}C$   |                 | -8.8    | A             |
| Power Dissipation                                | $T_A=25^{\circ}C$   | $P_D$           | 2.0     | W             |
| Power Dissipation                                | $T_A=70^{\circ}C$   |                 | 1.3     |               |
| Operating Junction and Storage Temperature Range |                     | $T_{J,TSTG}$    | -55~150 | $^{\circ}C$   |
| Typical Thermal Resistance <sup>(Note 4,5)</sup> | Junction to Case    | $R_{\theta JC}$ | 2.0     | $^{\circ}C/W$ |
|                                                  | Junction to Ambient | $R_{\theta JA}$ | 62.5    |               |



# PJQ5423-AU

## 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                                                       | -30  | -    | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                                         | -1.0 | -1.5 | -2.5 | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A                                                       | -    | 7.1  | 8.5  | mΩ    |
|                                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-8A                                                       | -    | 10   | 14   |       |
| 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    |
| Dynamic <sup>(Note 6)</sup>                           |                     |                                                                                                   |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-15V, I <sub>D</sub> =-10A,<br>V <sub>GS</sub> =-4.5V <sup>(Note 1,2)</sup>      | -    | 27   | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                   | -    | 8.4  | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                   | -    | 8.7  | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                           | -    | 3228 | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                   | -    | 396  | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                   | -    | 254  | -    |       |
| Turn-On Delay Time                                    | td <sub>(on)</sub>  | V <sub>DS</sub> =-15V, ID=-1A,<br>V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup> | -    | 10   | -    | ns    |
| Turn-On Rise Time                                     | tr                  |                                                                                                   | -    | 13   | -    |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                   | -    | 111  | -    |       |
| Turn-Off Fall Time                                    | tf                  |                                                                                                   | -    | 51   | -    |       |
| Drain-Source Diode                                    |                     |                                                                                                   |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | Is                  | ---                                                                                               | -    | -    | -60  | A     |
| Diode Forward Voltage                                 | VSD                 | Is=-1A, VGS=0V                                                                                    | -    | -0.7 | -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

# PJQ5423-AU

## TYPICAL CHARACTERISTIC CURVES

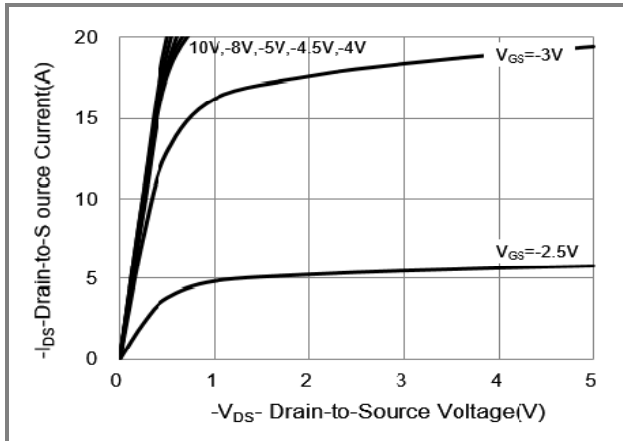


Fig.1 On-Region Characteristics

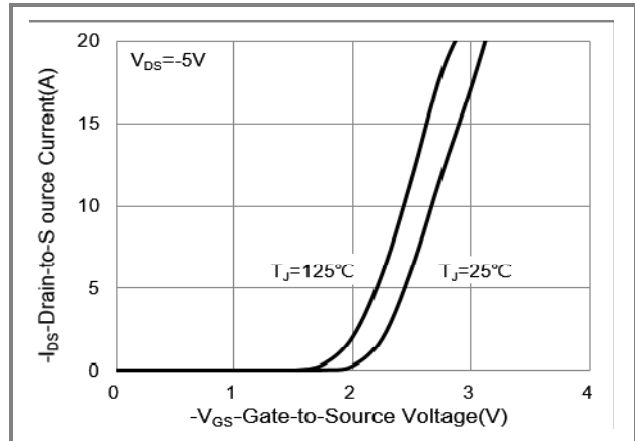


Fig.2 Transfer Characteristics

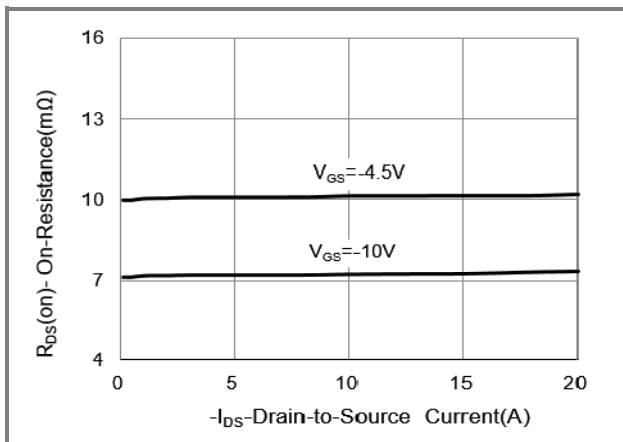


Fig.3 On-Resistance vs. Drain Current

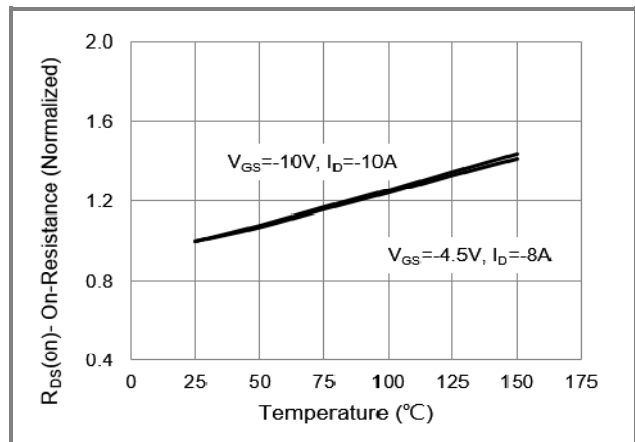


Fig.4 On-Resistance vs. Junction temperature

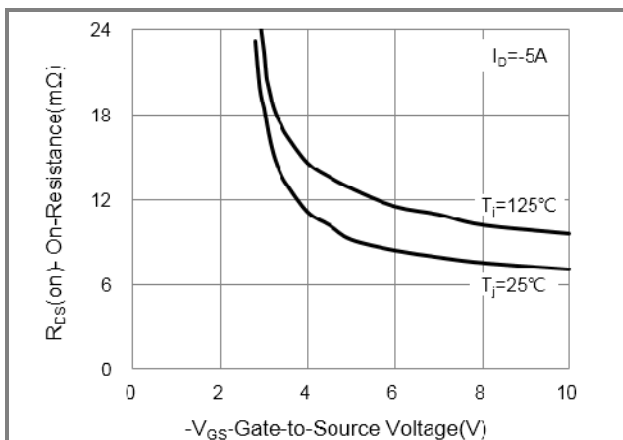


Fig.5 On-Resistance Variation with V\_GS.

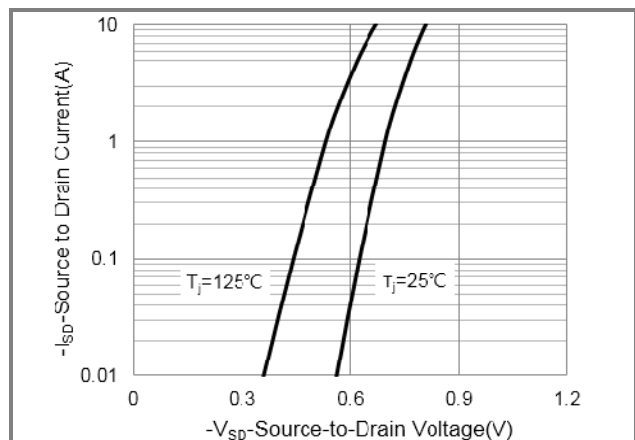
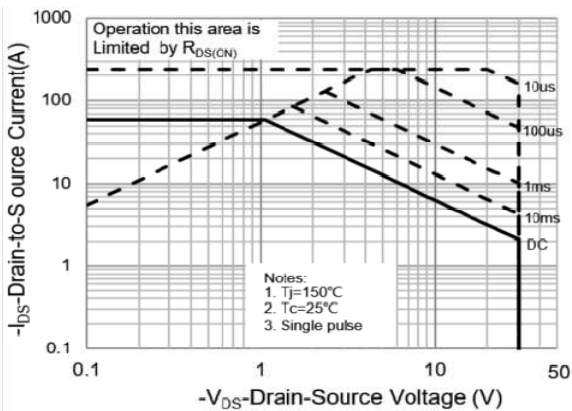
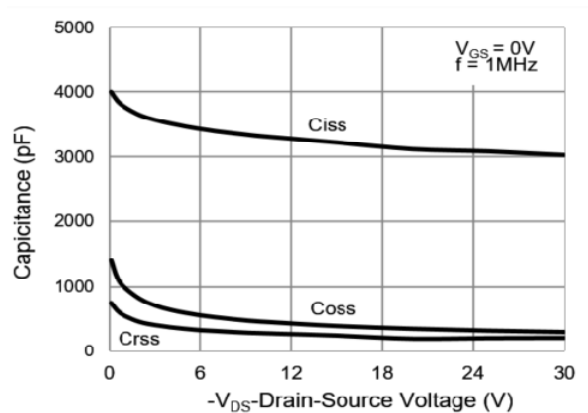
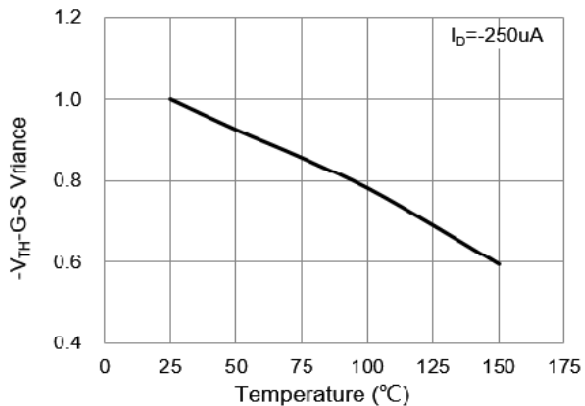
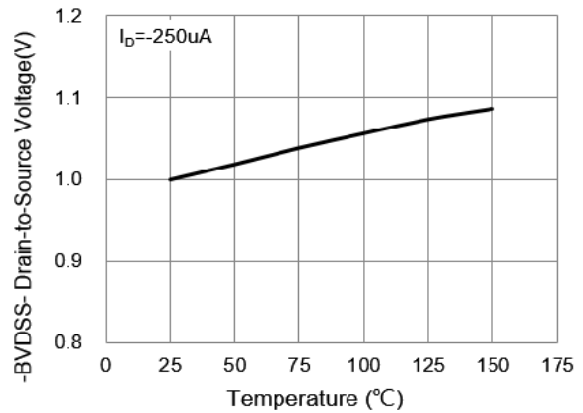
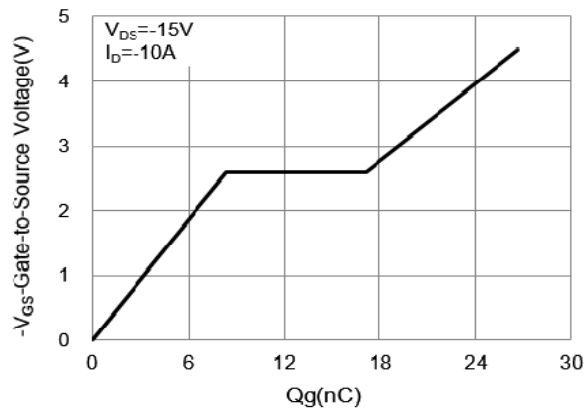


Fig.6 Body Diode Characteristics



# PJQ5423-AU

## TYPICAL CHARACTERISTIC CURVES





# PJQ5423-AU

## TYPICAL CHARACTERISTIC CURVES

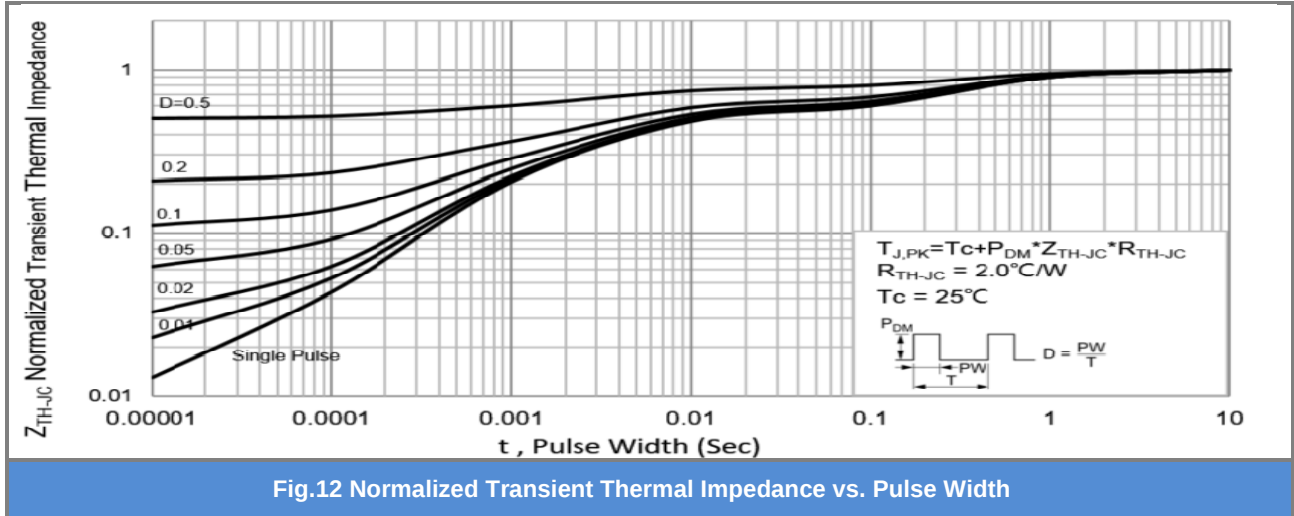
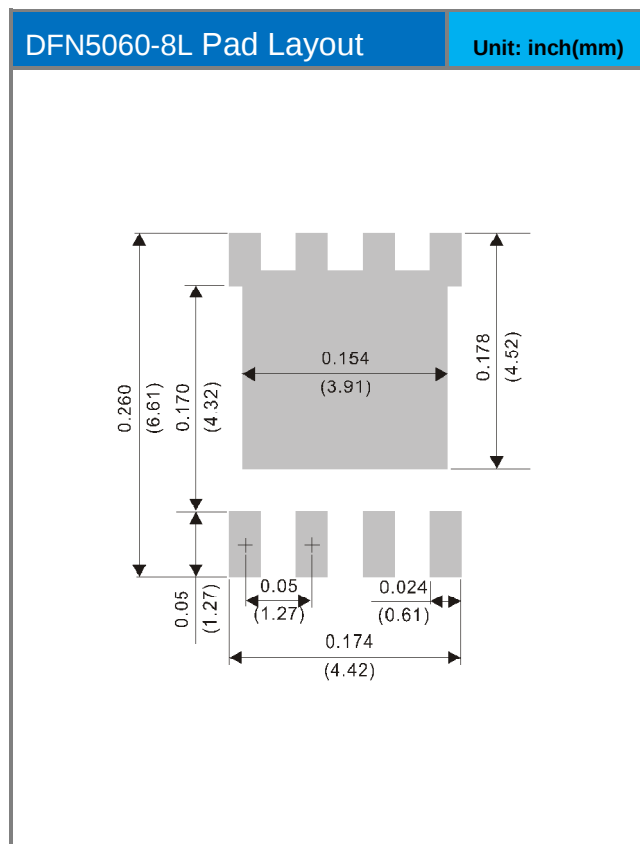
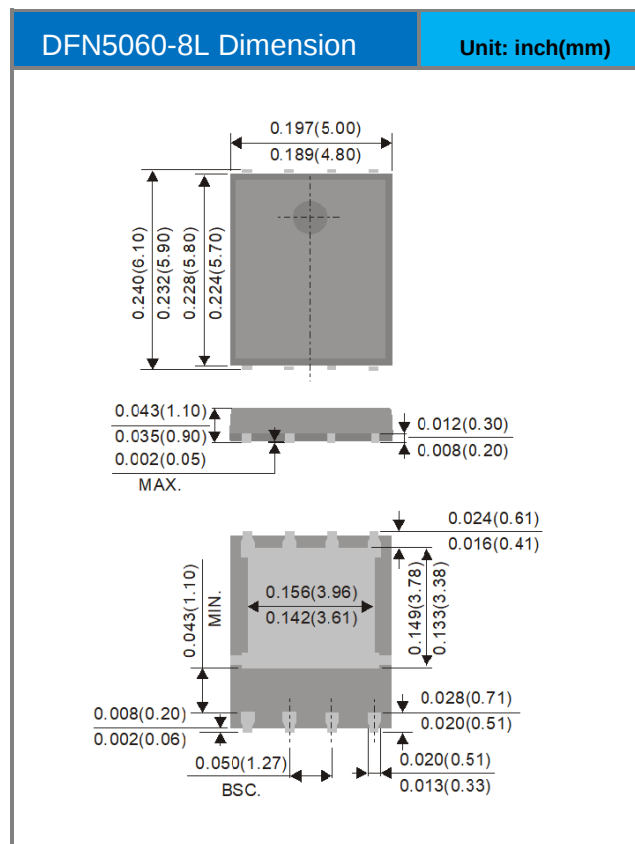


Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width

## Part No. Packing Code Version

| Part No. Packing Code | Package Type | Packing Type       | Marking | Version                        |
|-----------------------|--------------|--------------------|---------|--------------------------------|
| PJQ5423-AU_R2_000A1   | DFN5060-8L   | 3000pcs / 13" reel | Q5423   | Halogen free<br>RoHS compliant |

## Packaging Information & Mounting Pad Layout





## PJQ5423-AU

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