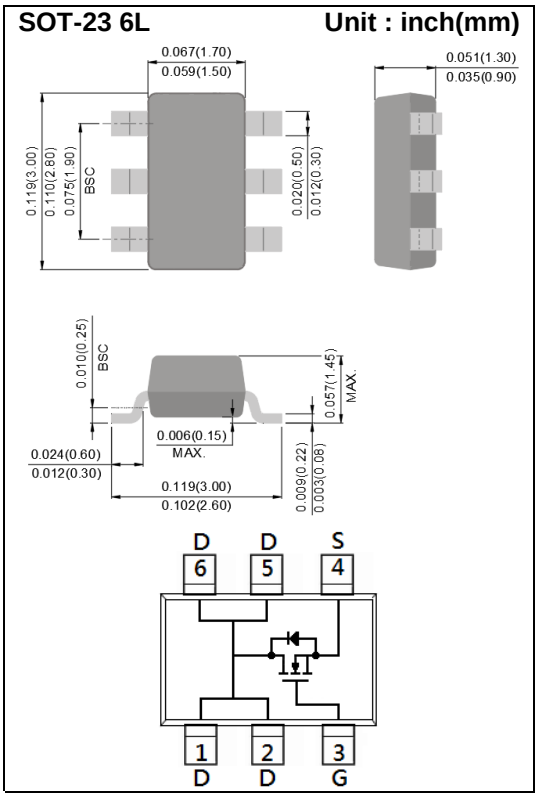
# PJS6416

## 20V N-Channel Enhancement Mode MOSFET

| Voltage | 20 V | Current | 7.4A |
|---|---|---|---|




### Features

- $R_{DS(ON)}$ , $V_{GS}$@4.5V, $I_D$@7.4A<27mΩ
- $R_{DS(ON)}$ , $V_{GS}$@2.5V, $I_D$@4.7A<41mΩ
- $R_{DS(ON)}$ , $V_{GS}$@1.8V, $I_D$@1.8A<85mΩ
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc..
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: SOT-23 6L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0005 ounces, 0.014 grams
- Marking: S16

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

| PARAMETER | | SYMBOL | LIMIT | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | | $I_D$ | 7.4 | A |
| Pulsed Drain Current | | $I_{DM}$ | 29.6 | A |
| Power Dissipation | $T_a$=25°C | $P_D$ | 2 | W |
| | Derate above 25°C | | 16 | mW/°C |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55~150 | °C |
| Typical Thermal Resistance<br>- Junction to Ambient(Note 3) | | $R_{\theta JA}$ | 62.5 | °C/W |

# PJS6416

## 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 | 20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 0.5 | 0.77 | 1.2 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=4.5V, $I_D$=7.4A | - | 24 | 27 | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=4.7A | - | 33 | 41 | |
| | | $V_{GS}$=1.8V, $I_D$=1.8A | - | 62 | 85 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | - | 0.01 | 1 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V, $V_{DS}$=0V | - | ±10 | ±100 | nA |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V, $I_D$=7.4A, $V_{GS}$=4.5V(Note 1,2) | - | 6.8 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 1.3 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 2 | - | |
| Input Capacitance | Ciss | $V_{DS}$=10V, $V_{GS}$=0V, f=1.0MHZ | - | 513 | - | pF |
| Output Capacitance | Coss | | - | 74 | - | |
| Reverse Transfer Capacitance | Crss | | - | 60 | - | |
| **Switching** | | | | | | |
| Turn-On Delay Time | $td_{(on)}$ | $V_{DD}$=10V, $I_D$=7.4A, $V_{GS}$=4.5V, $R_G$=6Ω(Note 1,2) | - | 7 | - | ns |
| Turn-On Rise Time | tr | | - | 57 | - | |
| Turn-Off Delay Time | $td_{(off)}$ | | - | 24 | - | |
| Turn-Off Fall Time | tf | | - | 14 | - | |
| **Drain-Source Diode** | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$ | --- | - | - | 2.0 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1.0A, $V_{GS}$=0V | - | 0.69 | 1.2 | V |

NOTES :

1. Pulse width≤300us, Duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\Theta JA}$ 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 FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited

# PJS6416

## TYPICAL CHARACTERISTIC CURVES

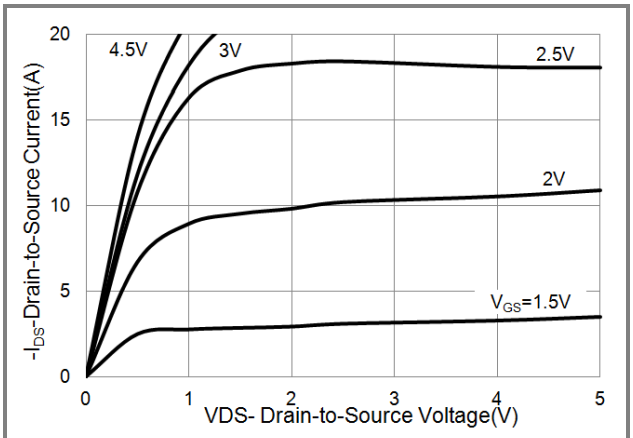



Fig.1 On-Region Characteristics

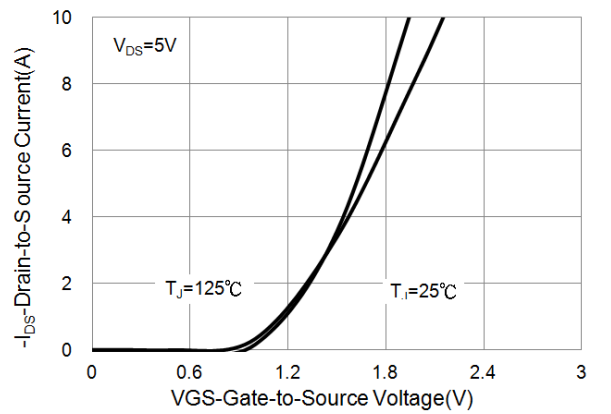



Fig.2 Transfer Characteristics

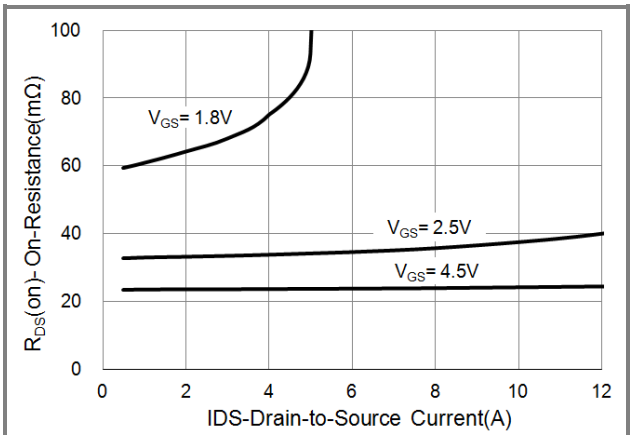



Fig.3 On-Resistance vs. Drain Current

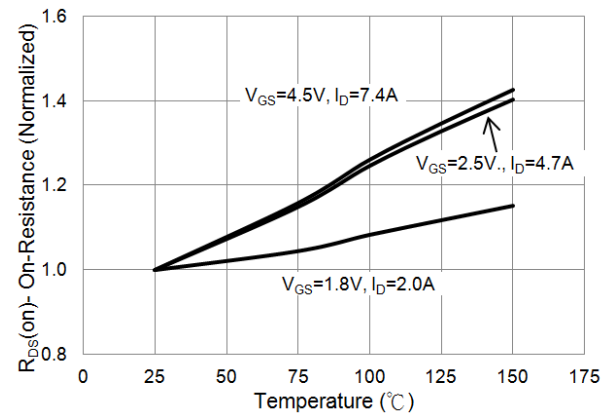



Fig.4 On-Resistance vs. Junction temperature

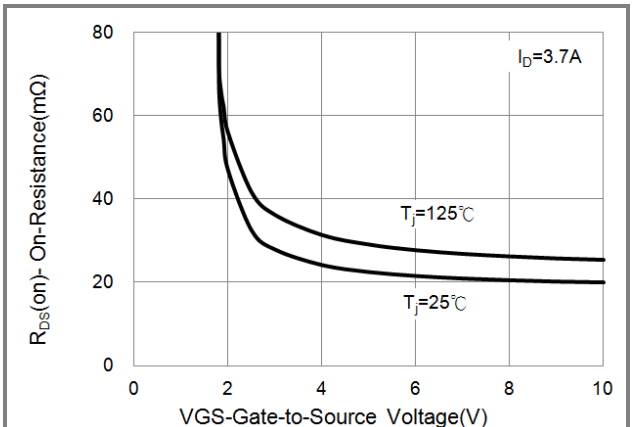



Fig.5 On-Resistance Variation with VGS.

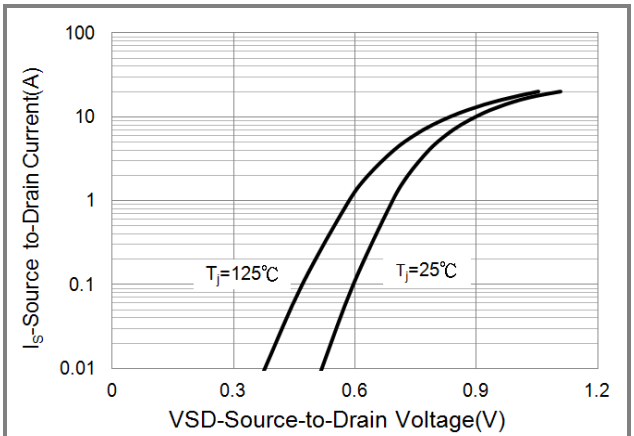



Fig.6 Body Diode Characteristics

# PJS6416

## TYPICAL CHARACTERISTIC CURVES

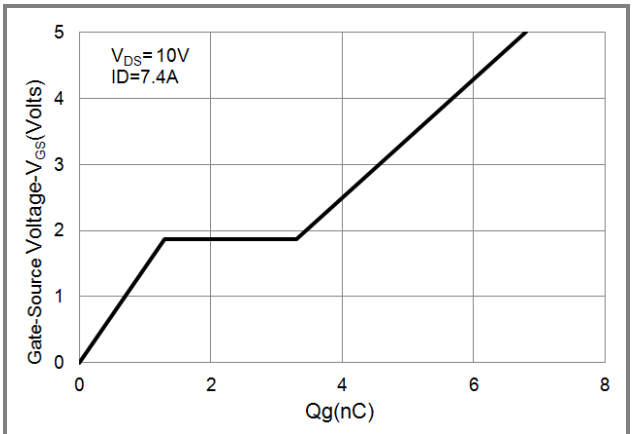



Fig.7 Gate-Charge Characteristics

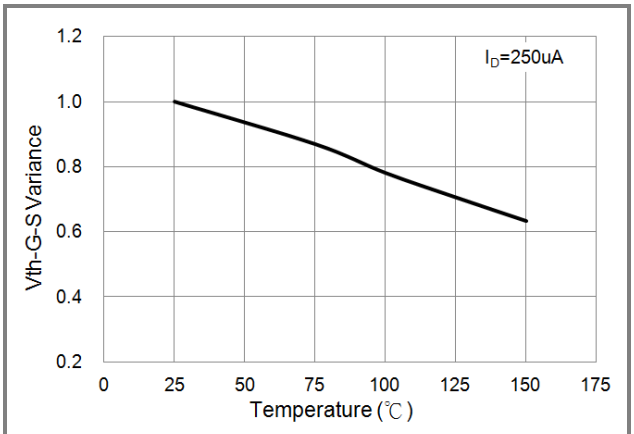



Fig.8 Threshold Voltage Variation with Temperature.

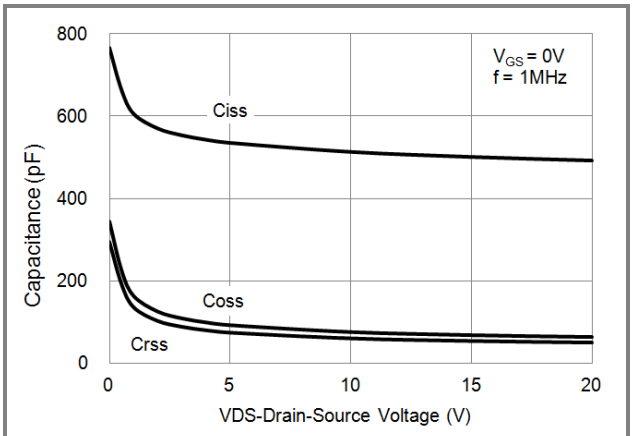


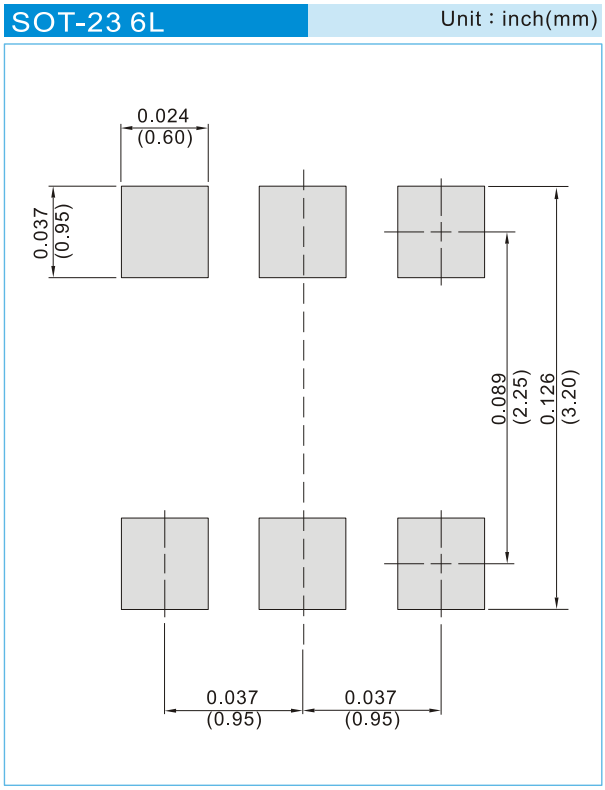

Fig.9 Capacitance vs. Drain-Source Voltage.

# PJS6416

## Product and Packing Information

| Part No. | Package Type | Packing Type | Marking |
|---|---|---|---|
| PJS6416 | SOT-23 6L | 3K pcs / 7” reel | S16 |
| PJS6416 | SOT-23 6L | 10K pcs / 13” reel | S16 |

## Mounting Pad Layout



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