



**THE DATASHEET OF
PJA3416A_R1_00001**





PJA3416A

20V N-Channel Enhancement Mode MOSFET

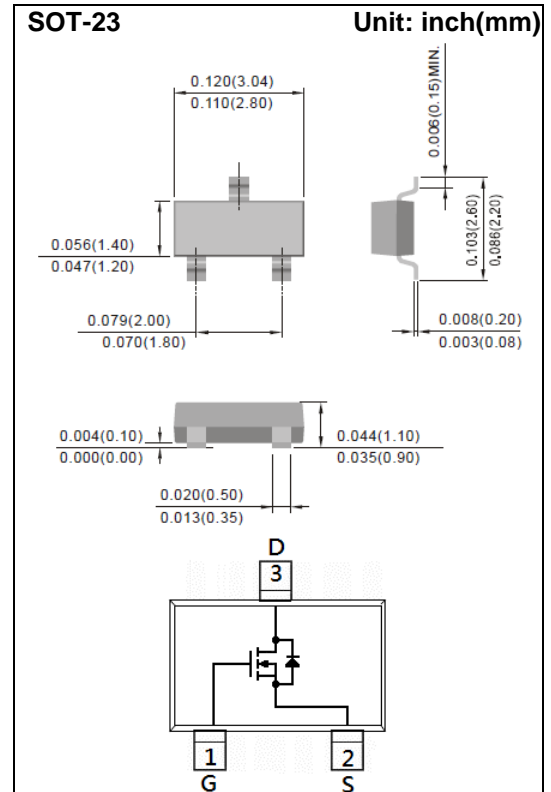
Voltage 20 V **Current** 5.8A

Features

- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@5.8A < 24m\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@3.2A < 30m\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_D@1.6A < 42m\Omega$
- 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 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0003 ounces, 0.0084 grams



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ C$ 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 | 5.8 | A |
| Pulsed Drain Current | I_{DM} | 23.2 | A |
| Power Dissipation | P_D | $T_a=25^\circ C$ | 1.25 |
| | | Derate above $25^\circ C$ | 10 |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ C$ |
| Typical Thermal Resistance | $R_{\theta JA}$ | 100 | $^\circ C/W$ |
| - Junction to Ambient ^(Note 3) | | | |



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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 | 20 | - | - | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 0.5 | 0.68 | 1.2 | V |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =4.5V, I _D =5.8A | - | 20 | 24 | mΩ |
| | | V _{GS} =2.5V, I _D =3.2A | - | 25 | 30 | |
| | | V _{GS} =1.8V, I _D =1.6A | - | 32 | 42 | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =20V, V _{GS} =0V | - | - | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±12V, V _{DS} =0V | - | - | ±100 | nA |
| Dynamic (Note 5) | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =10V, I _D =5.8A, V _{GS} =4.5V(Note 1,2) | - | 10.4 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 0.8 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 3.2 | - | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V, f=1.0MHZ | - | 592 | - | pF |
| Output Capacitance | C _{oss} | | - | 91 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 82 | - | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} =10V, I _D =5.8A, V _{GS} =4.5V, R _G =6Ω(Note 1,2) | - | 4.3 | - | ns |
| Turn-On Rise Time | t _r | | - | 39 | - | |
| Turn-Off Delay Time | t _{d(off)} | | - | 31 | - | |
| Turn-Off Fall Time | t _f | | - | 30 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I _S | --- | - | - | 1.5 | A |
| Diode Forward Voltage | V _{SD} | I _S =1.0A, V _{GS} =0V | - | 0.76 | 1.2 | V |

NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} 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
5. Guaranteed by design, not subject to production testing



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TYPICAL CHARACTERISTIC CURVES

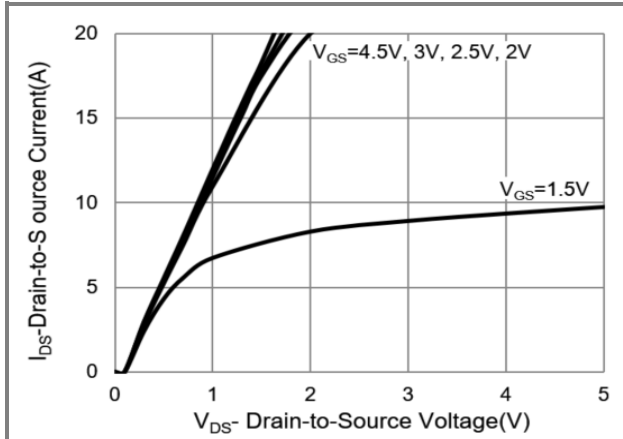


Fig.1 On-Region Characteristics

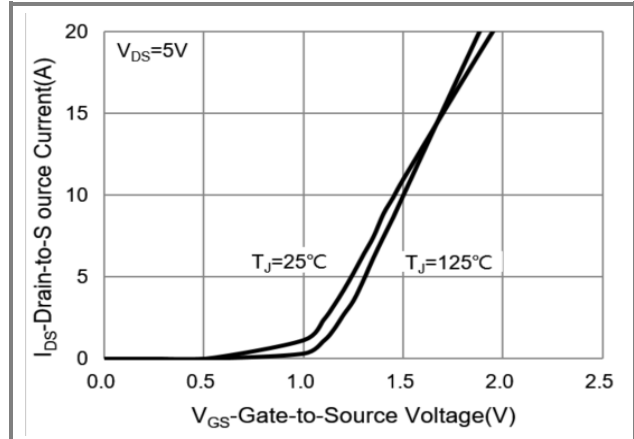


Fig.2 Transfer Characteristics

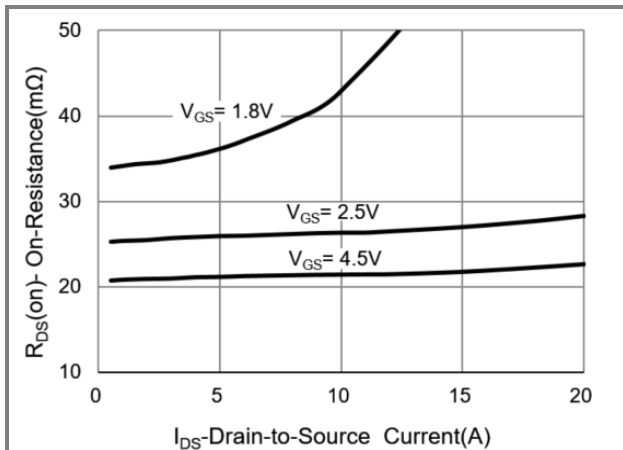


Fig.3 On-Resistance vs. Drain Current

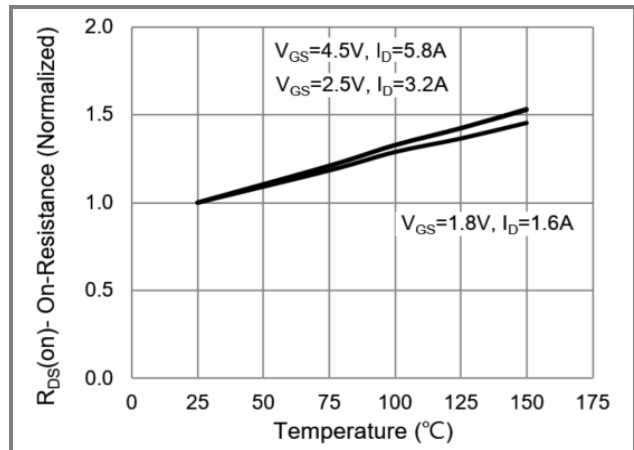


Fig.4 On-Resistance vs. Junction temperature

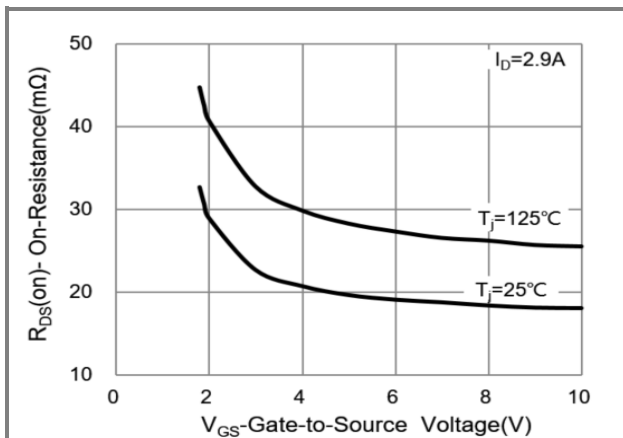


Fig.5 On-Resistance Variation with VGS.

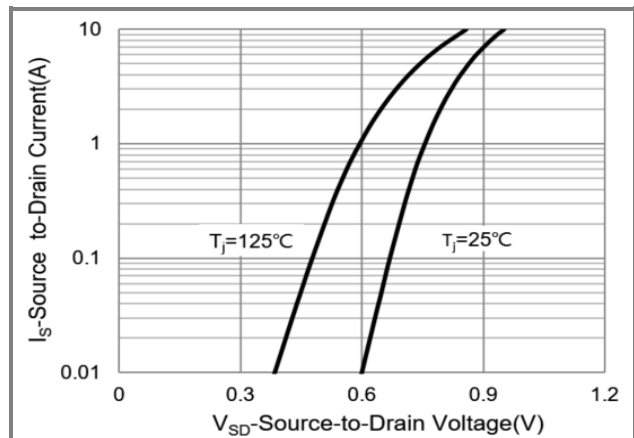


Fig.6 Body Diode Characteristics



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TYPICAL CHARACTERISTIC CURVES

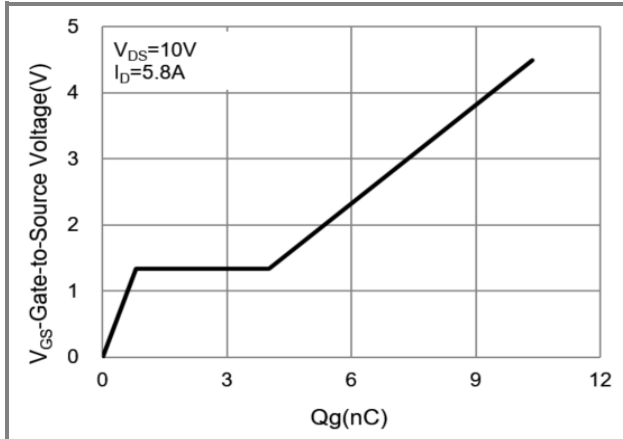


Fig.7 Gate-Charge Characteristics

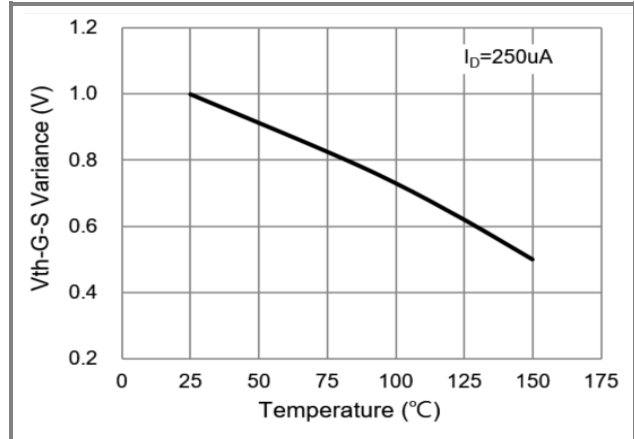


Fig.8 Threshold Voltage Variation with Temperature.

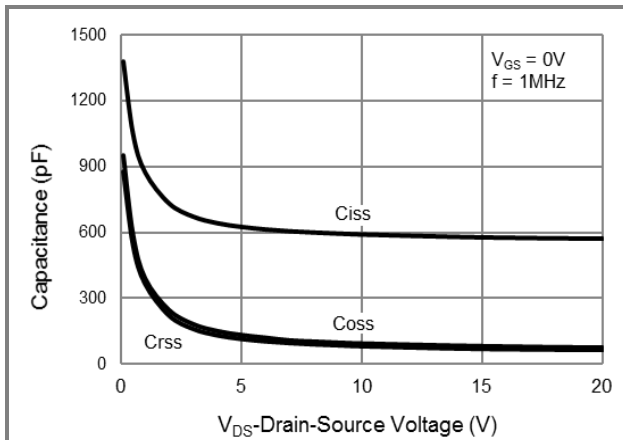


Fig.9 Capacitance vs. Drain-Source Voltage.

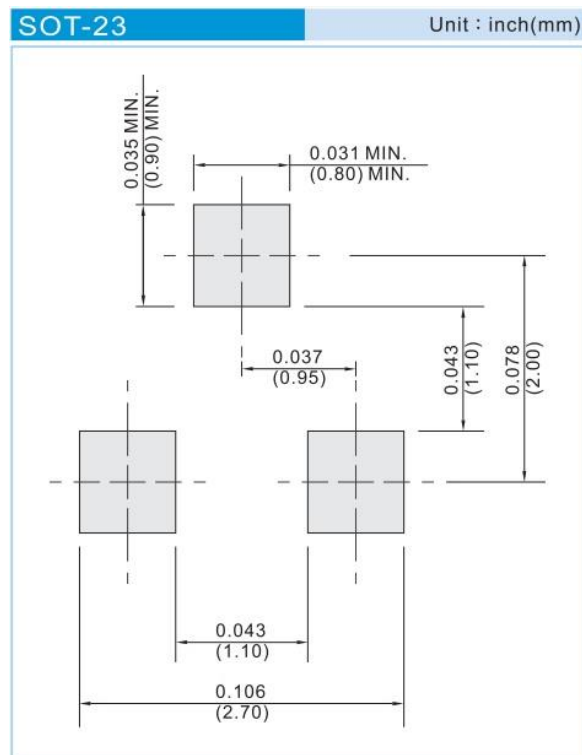


PJA3416A

PART NO. PACKING CODE VERSION

| Part No. Packing Code | Package Type | Packing Type | Marking | Version |
|-----------------------|--------------|--------------------|---------|--------------------------------|
| PJA3416A_R1_00001 | SOT-23 | 3K pcs / 7" reel | A6A | Halogen free RoHS compliant |
| PJA3416A_R2_00001 | SOT-23 | 12K pcs / 13" reel | A6A | Halogen free RoHS compliant |

MOUNTING PAD LAYOUT






PJA3416A

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