



# PJS6416

## 20V N-Channel Enhancement Mode MOSFET

**Voltage**

**20 V**

**Current**

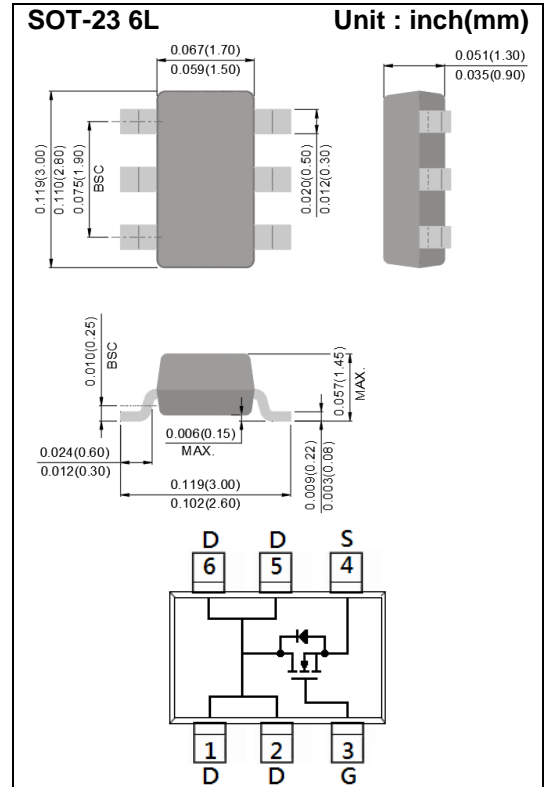
**7.4A**

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@7.4A < 27m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@2.5V$ ,  $I_D@4.7A < 41m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@1.8V$ ,  $I_D@1.8A < 85m\Omega$
- 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 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 ( $T_A=25^\circ C$ unless otherwise noted)

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



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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	20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5	0.77	1.2	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =7.4A	-	24	27	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.7A	-	33	41	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1.8A	-	62	85	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	-	0.01	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	±10	±100	nA
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =7.4A, V <sub>GS</sub> =4.5V <sup>(Note 1,2)</sup>	-	6.8	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1.0MHZ	-	513	-	pF
Output Capacitance	C <sub>oss</sub>		-	74	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	60	-	
<b>Switching</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =7.4A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup>	-	7	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	57	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	24	-	
Turn-Off Fall Time	t <sub>f</sub>		-	14	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>s</sub>	---	-	-	2.0	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V	-	0.69	1.2	V

**NOTES :**

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



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## TYPICAL CHARACTERISTIC CURVES

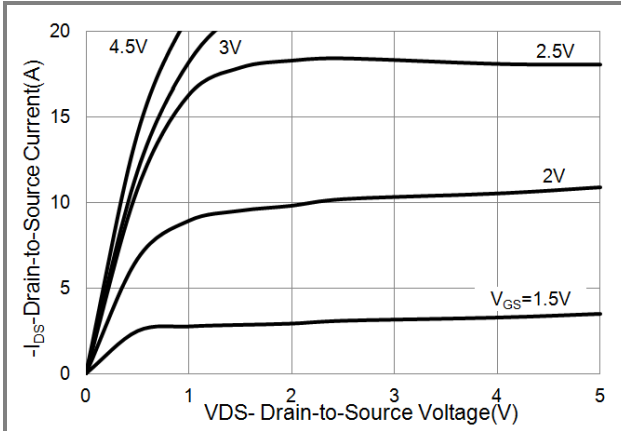


Fig.1 On-Region Characteristics

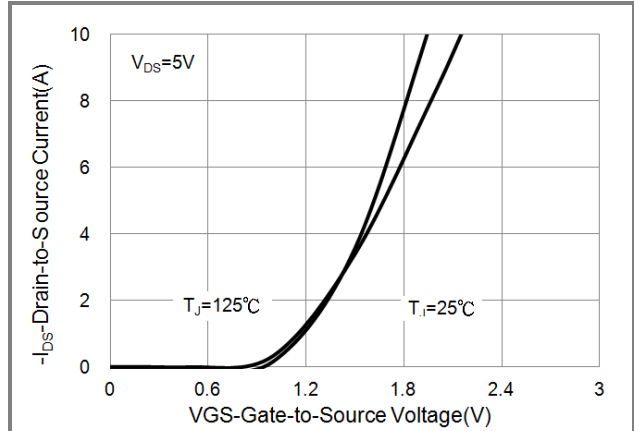


Fig.2 Transfer Characteristics

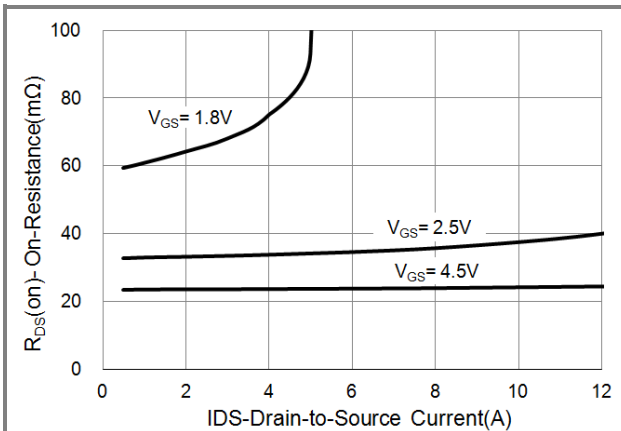


Fig.3 On-Resistance vs. Drain Current

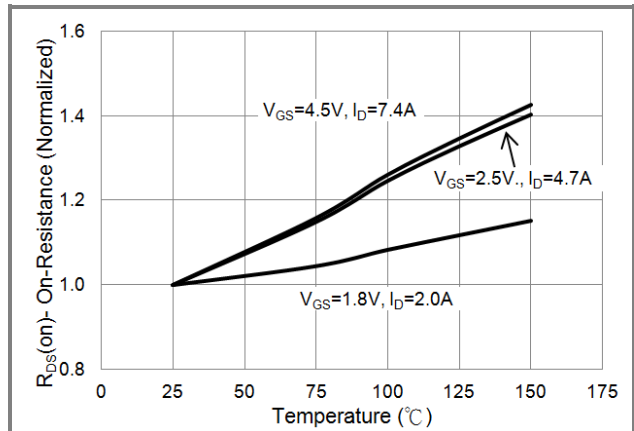


Fig.4 On-Resistance vs. Junction temperature

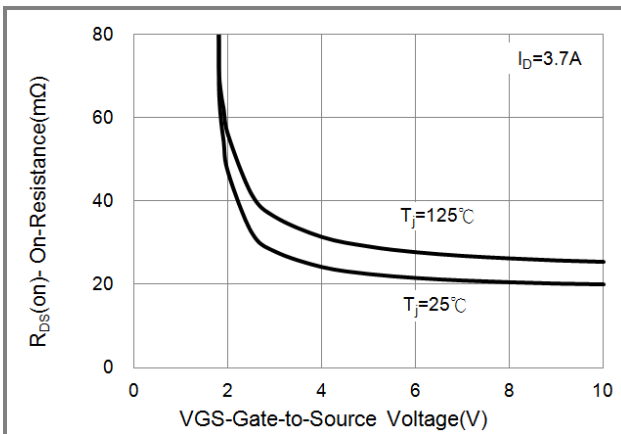


Fig.5 On-Resistance Variation with VGS.

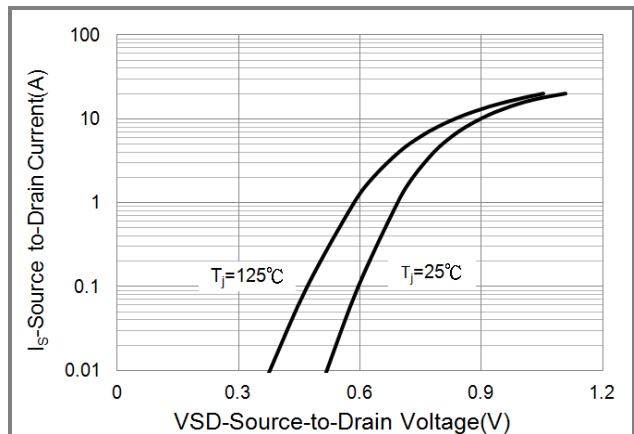


Fig.6 Body Diode Characteristics



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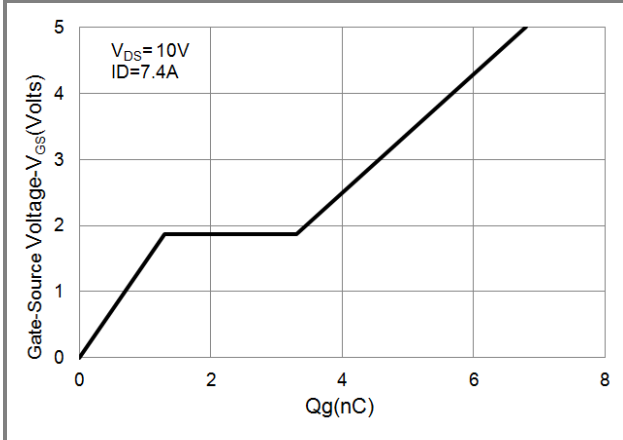


Fig.7 Gate-Charge Characteristics

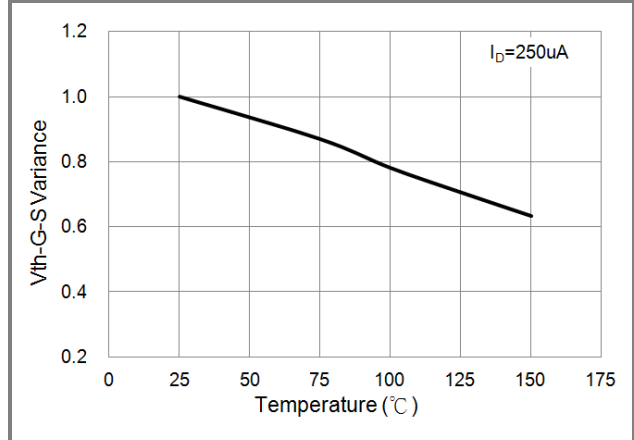


Fig.8 Threshold Voltage Variation with Temperature.

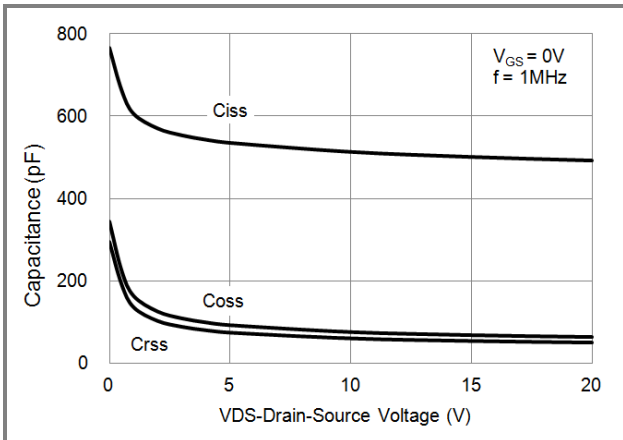


Fig.9 Capacitance vs. Drain-Source Voltage.



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## PART NO. PACKING CODE VERSION

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJS6416_S1_00001	SOT-23 6L	3K pcs / 7" reel	S16	Halogen free RoHS compliant
PJS6416_S2_00001	SOT-23 6L	10K pcs / 13" reel	S16	Halogen free RoHS compliant

## MOUNTING PAD LAYOUT

