



# PJE8406

## 20V N-Channel Enhancement Mode MOSFET – ESD Protected

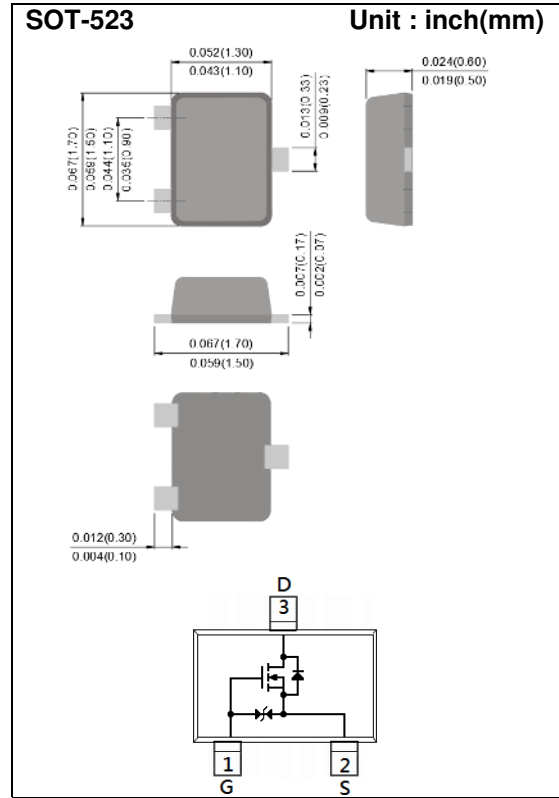
**Voltage** 20 V **Current** 800 mA

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@4.5V, I_{DS}@500mA=0.4\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@2.5V, I_{DS}@300mA=0.7\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@1.8V, I_{DS}@100mA=1.2\Omega$ (typ)
- Advanced Trench Process Technology
- Specially Designed for Load Switch or PWM application.
- ESD Protected
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : SOT-523 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.002 grams
- Marking : E06



### Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ 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		$I_D$	800	mA
Pulsed Drain Current		$I_{DM}$	3000	mA
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	350	mW
	Derate above $25^\circ\text{C}$		2.8	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Typical Thermal Resistance - Junction to Ambient <sup>(Note 3)</sup>		$R_{\theta JA}$	357	$^\circ\text{C/W}$



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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	0.4	0.63	1.0	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =500mA	-	0.35	0.4	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =300mA	-	0.6	0.7	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =100mA	-	1.2	-	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	-	0.02	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±4.5V, V <sub>DS</sub> =0V	-	±0.05	±1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	-	±2	±10	uA
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =500mA, V <sub>GS</sub> =4.5V <sup>(Note 1,2)</sup>	-	0.92	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.31	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	0.08	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1.0MHZ	-	50	-	pF
Output Capacitance	C <sub>oss</sub>		-	10	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	8.5	-	
<b>Switching</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =500mA, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup>	-	4	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	20	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	12	-	
Turn-Off Fall Time	t <sub>f</sub>		-	25	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	500	mA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =500mA, V <sub>GS</sub> =0V	-	0.91	1.3	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 square pad of copper



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## TYPICAL CHARACTERISTIC CURVES

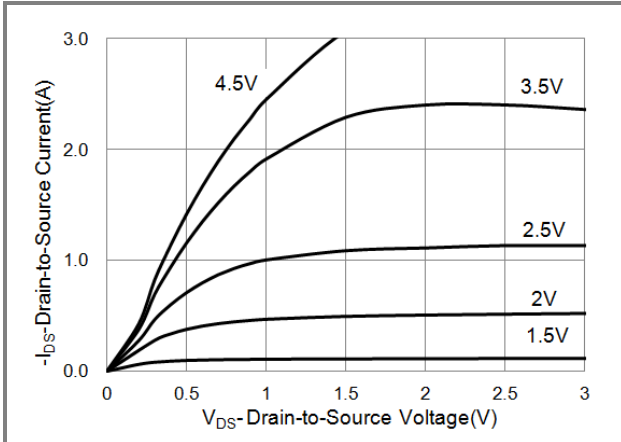


Fig.1 On-Region Characteristics

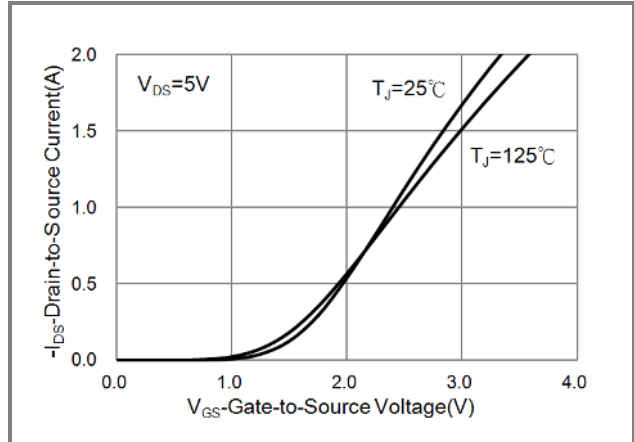


Fig.2 Transfer Characteristics

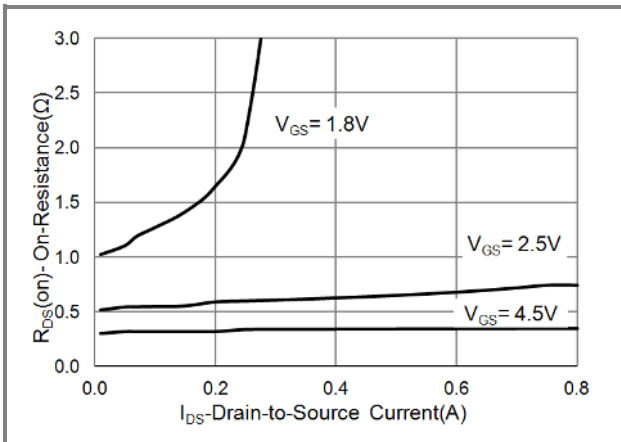


Fig.3 On-Resistance vs. Drain Current

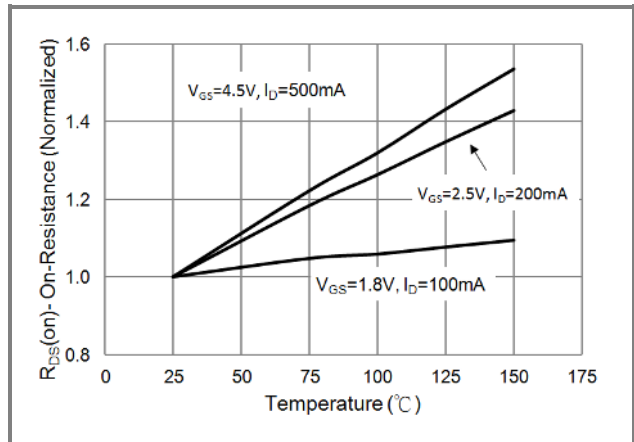


Fig.4 On-Resistance vs. Junction temperature

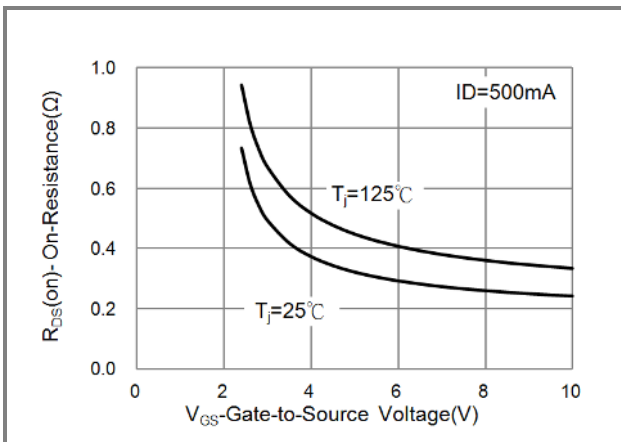


Fig.5 On-Resistance Variation with V\_GS.

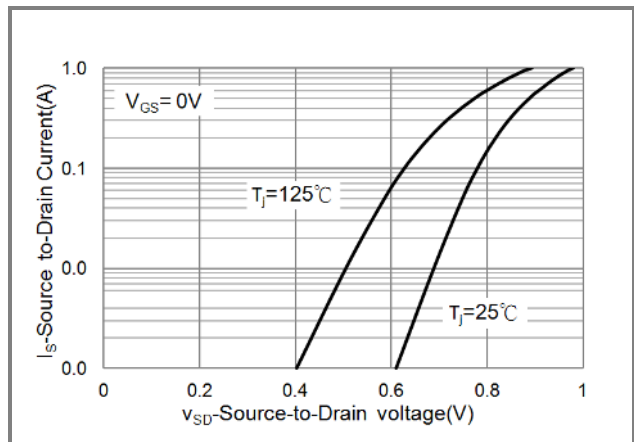


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

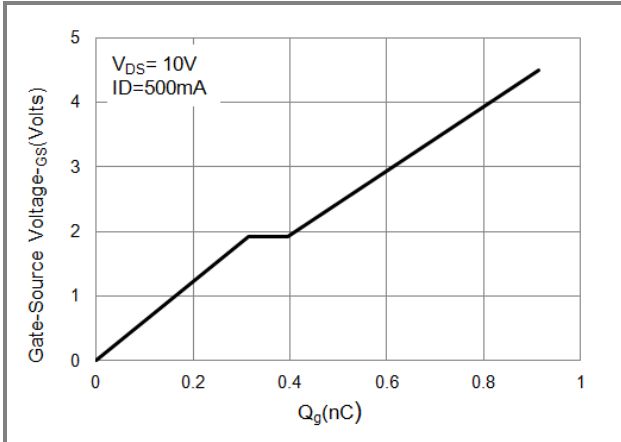


Fig.7 Gate-Charge Characteristics

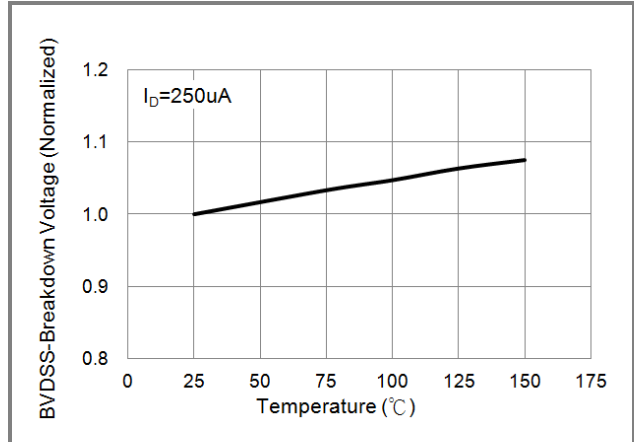


Fig.8 Breakdown Voltage Variation vs. Temperature

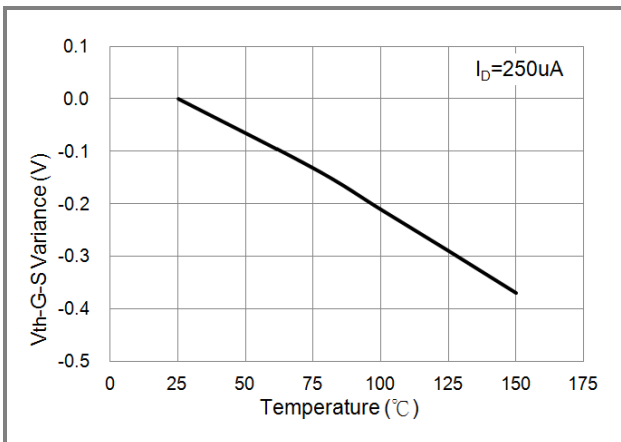


Fig.9 Threshold Voltage Variation with Temperature.

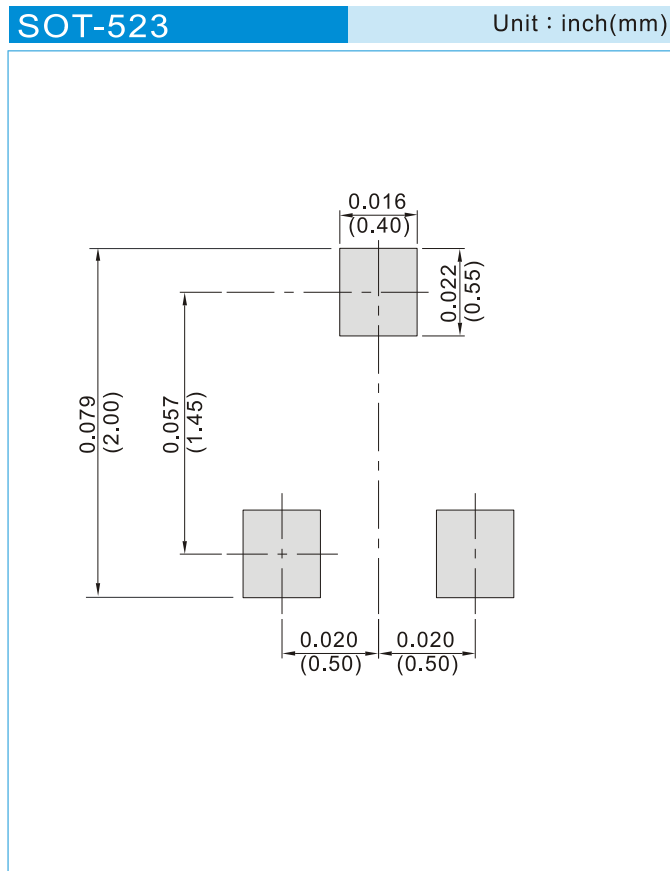


# PJE8406

## PART NO. PACKING CODE VERSION

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJE8406_R1_00001	SOT-523	4K pcs / 7" reel	E06	Halogen free RoHS compliant

## MOUNTING PAD LAYOUT





## **PJE8406**

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