



# PJE8406

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

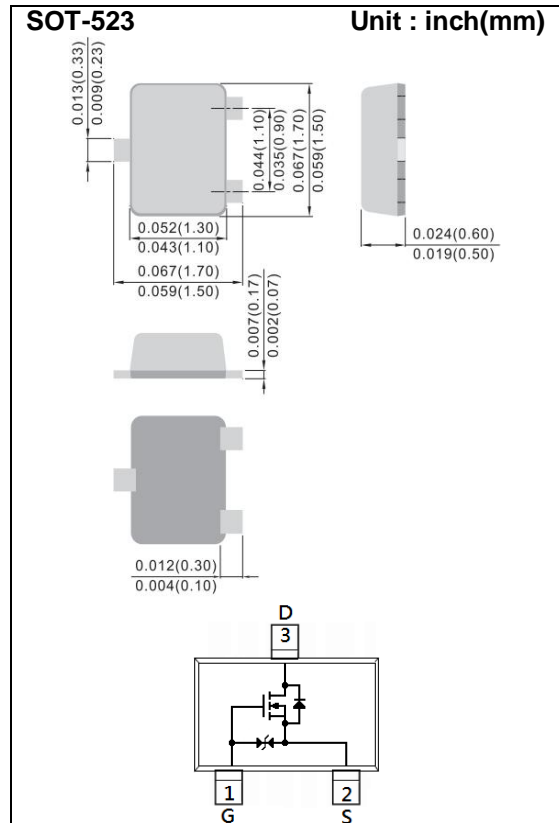
**Voltage**    **20 V**    **Current**    **800mA**

### Features

- $R_{DS(ON)}, V_{GS}@4.5V, I_{DS}@500mA}=0.4\Omega$
- $R_{DS(ON)}, V_{GS}@2.5V, I_{DS}@300mA}=0.7\Omega$
- $R_{DS(ON)}, V_{GS}@1.8V, I_{DS}@100mA}=1.2\Omega(\text{typ})$
- Advanced Trench Process Technology
- Specially Designed for Load Switch or PWM application.
- ESD Protected
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std.(Halogen Free)

### Mechanical Data

- Case: SOT-523 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.00007 ounces, 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	$P_D$	$T_A=25^\circ\text{C}$	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	$R_{\theta JA}$	357	$^\circ\text{C/W}$	
- Junction to Ambient <sup>(Note 3)</sup>				



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## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.63	1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=500mA$	-	0.35	0.4	$\Omega$
		$V_{GS}=2.5V, I_D=300mA$	-	0.6	0.7	
		$V_{GS}=1.8V, I_D=100mA$	-	1.2	-	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V, V_{GS}=0V$	-	0.02	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	$\pm 0.05$	$\pm 1$	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	$\pm 2$	$\pm 10$	$\mu A$
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=500mA,$ $V_{GS}=4.5V$ (Note 1,2)	-	0.92	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.31	-	
Gate-Drain Charge	$Q_{gd}$		-	0.08	-	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $f=1.0MHz$	-	50	-	pF
Output Capacitance	$C_{oss}$		-	10	-	
Reverse Transfer Capacitance	$C_{rss}$		-	8.5	-	
<b>Switching</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=500mA,$ $V_{GS}=4.5V,$ $R_G=6\Omega$ (Note 1,2)	-	4	-	ns
Turn-On Rise Time	$t_r$		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	12	-	
Turn-Off Fall Time	$t_f$		-	25	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	500	mA
Diode Forward Voltage	$V_{SD}$	$I_S=500mA, V_{GS}=0V$	-	0.91	1.3	V

NOTES:

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
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 square pad of copper



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## TYPICAL CHARACTERISTIC CURVES

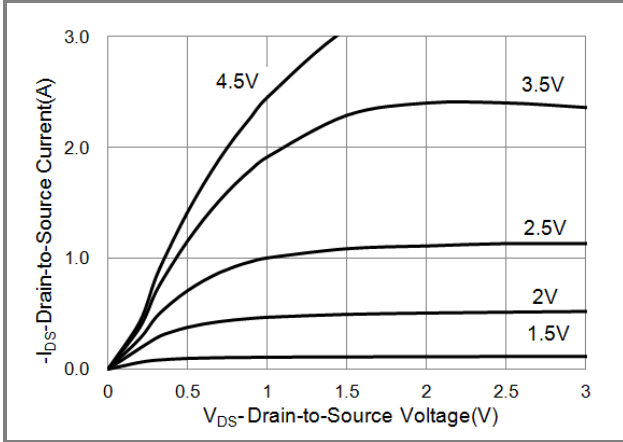


Fig.1 On-Region Characteristics

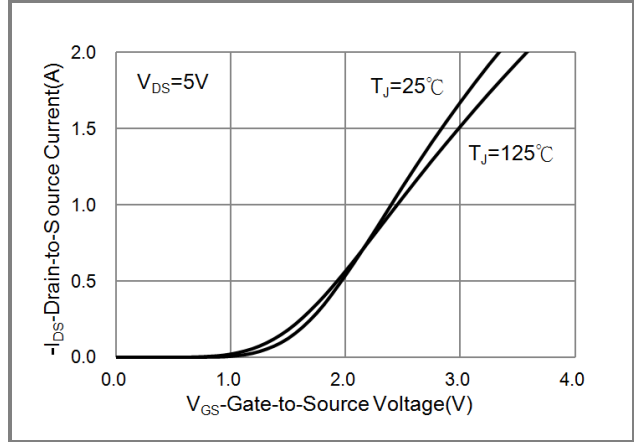


Fig.2 Transfer Characteristics

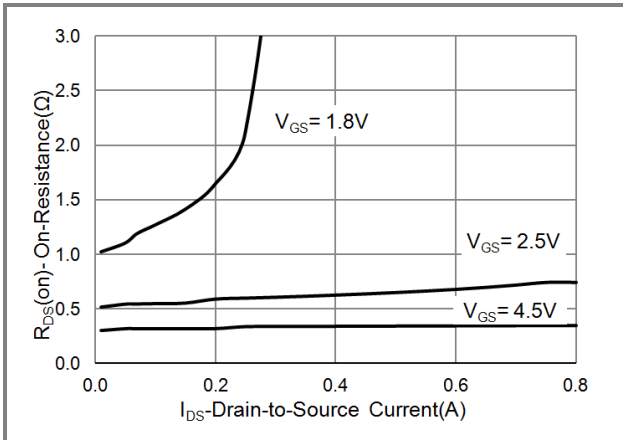


Fig.3 On-Resistance vs. Drain Current

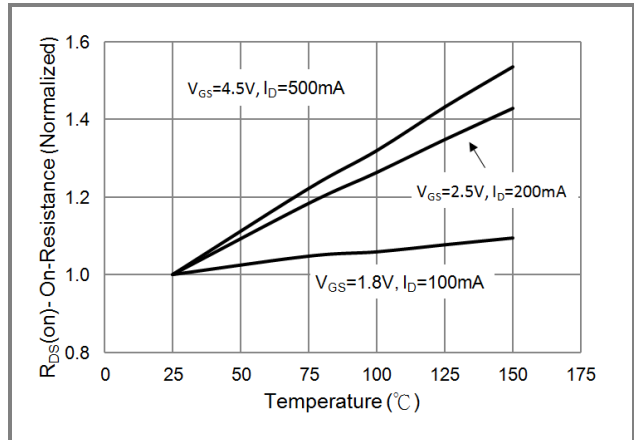


Fig.4 On-Resistance vs. Junction temperature

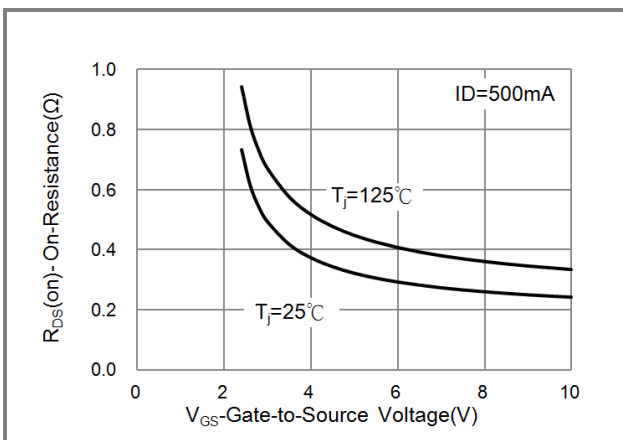


Fig.5 On-Resistance Variation with  $V_{G_S}$ .

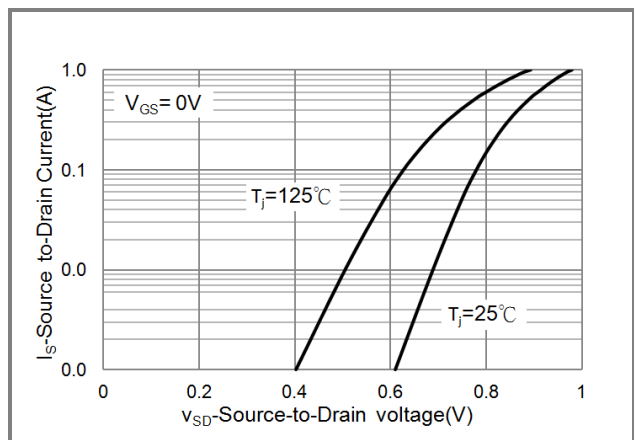


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

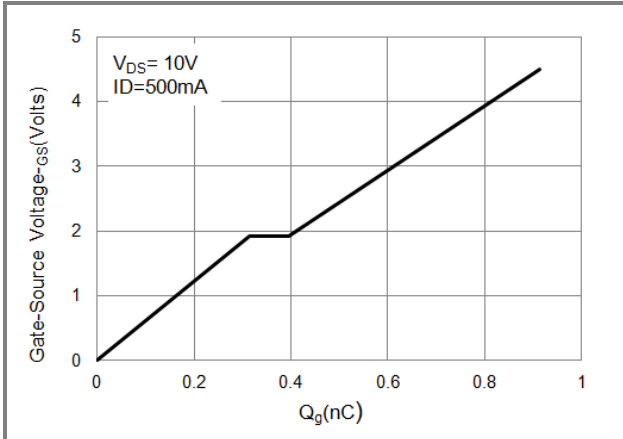


Fig.7 Gate-Charge Characteristics

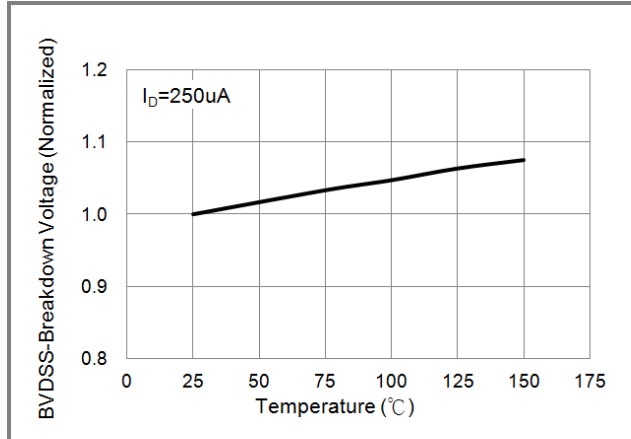


Fig.8 Breakdown Voltage Variation vs. Temperature

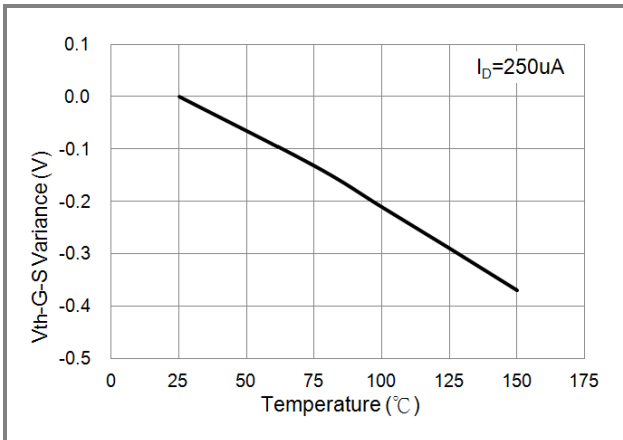


Fig.9 Threshold Voltage Variation with Temperature.

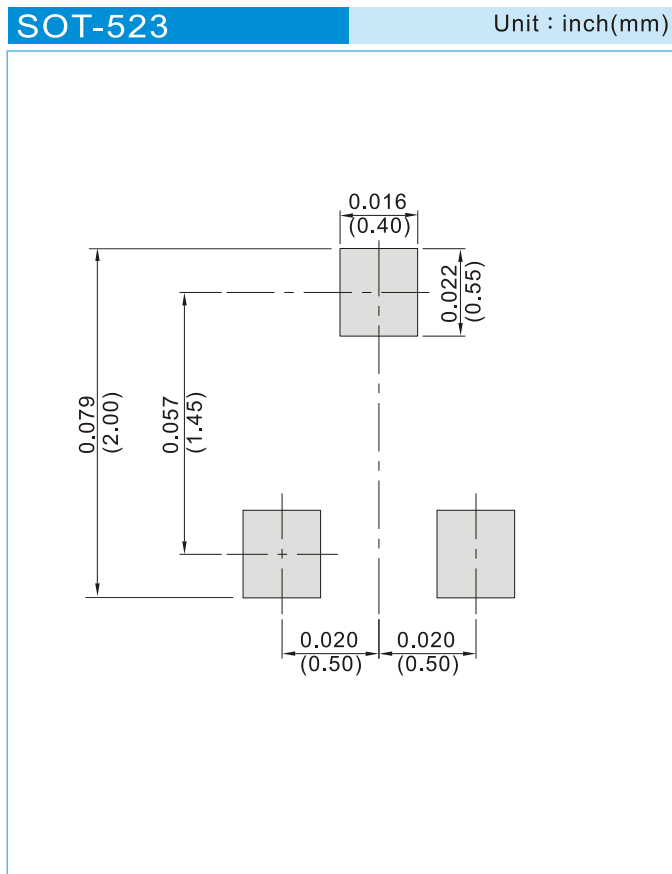


# PJE8406

## 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

## MOUNTING PAD LAYOUT





## PJE8406

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