



PJA3409E

30V P-Channel Enhancement Mode MOSFET– ESD Protected

Voltage **-30 V** **Current** **-3.0 A**

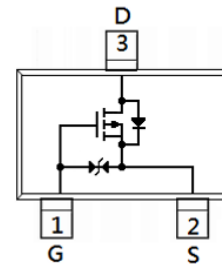
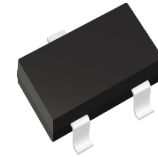
Features

- $R_{DS(ON)}$, $V_{GS}@-10V$, $I_D@-2.6A < 95m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-1.5A < 155m\Omega$
- ESD Protected
- Advanced Trench Process Technology
- 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

SOT-23



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ C$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (Note 4)	$T_A=25^\circ C$	I_D	-3.0	A
	$T_A=70^\circ C$		-2.4	
Pulsed Drain Current (Note 1)	$T_A=25^\circ C$	I_{DM}	-12	
Power Dissipation	$T_A=25^\circ C$	P_D	1.25	W
	Derate above $25^\circ C$		10	mW/ $^\circ C$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ C$
Typical Thermal resistance - Junction to Ambient (Note 5)		$R_{\theta JA}$	100	$^\circ C/W$



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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	-30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1.3	-1.8	-2.3	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-2.6A	-	74	95	mΩ
		V _{GS} =-4.5V, I _D =-1.5A	-	110	155	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V	-	-	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	uA
Dynamic (Note 6)						
Total Gate Charge	Q _g	V _{DS} =-24V, I _D =-2.6A, V _{GS} =-10V (Note 2,3)	-	6.3	-	nC
Gate-Source Charge	Q _{gs}		-	0.9	-	
Gate-Drain Charge	Q _{gd}		-	1.7	-	
Input Capacitance	C _{iss}	V _{DS} =-24V, V _{GS} =0V, f=1MHZ	-	214	-	pF
Output Capacitance	C _{oss}		-	39	-	
Reverse Transfer Capacitance	C _{rss}		-	21	-	
Gate resistance	R _g	f=1.0MHZ	-	6.8	-	Ω
Turn-On Delay Time	td _(on)	V _{DS} =-24V, I _D =-2.6A, V _{GS} =-10V, R _G =3Ω (Note 2,3)	-	2	-	ns
Turn-On Rise Time	t _r		-	23	-	
Turn-Off Delay Time	td _(off)		-	10	-	
Turn-Off Fall Time	t _f		-	21	-	
Drain-Source Diode						
Diode Forward Current	I _s	T _A =25°C	-	-	-3	A
Diode Forward Voltage	V _{SD}	I _s =-1A, V _{GS} =0V	-	-0.85	-1	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _s =-2.6A	-	132	-	ns
Reverse Recovery Charge	Q _{rr}	di/dt=100A/us (Note 2,3)	-	259	-	nC

Note :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J = 25°C.
4. The maximum current rating is package limited.
5. 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 inch² with 2oz. square pad of copper.
6. Guaranteed by design, not subject to production testing.



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TYPICAL CHARACTERISTIC CURVES

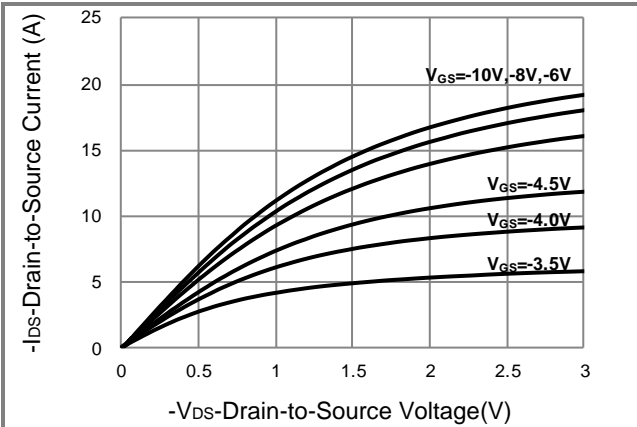


Fig.1 Output Characteristics

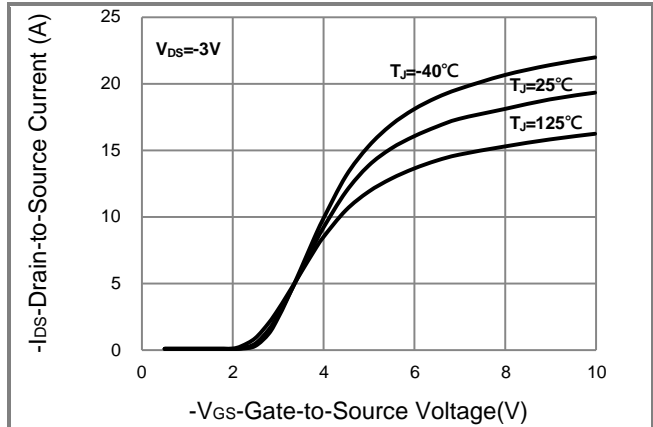


Fig.2 Transfer Characteristics

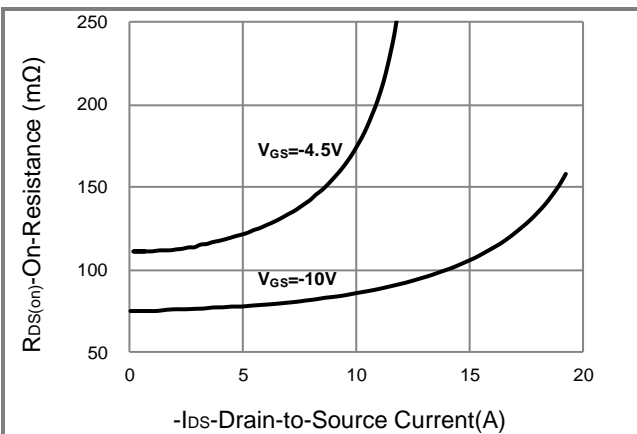


Fig.3 On-Resistance vs. Drain Current

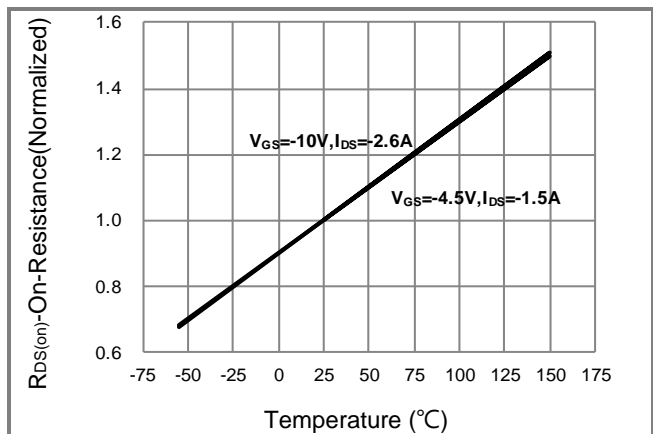


Fig.4 On-Resistance vs. Junction temperature

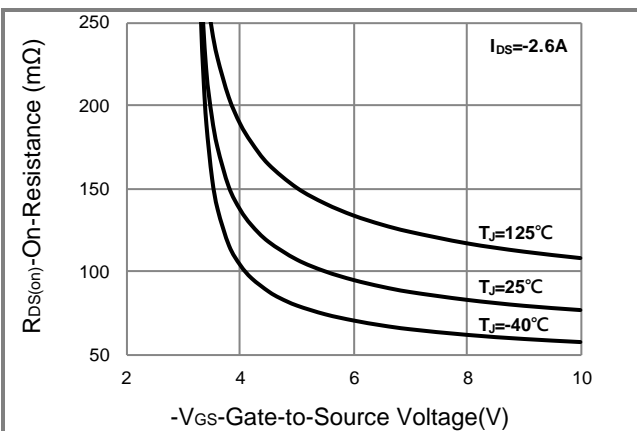


Fig.5 On-Resistance Variation with V_{GS}

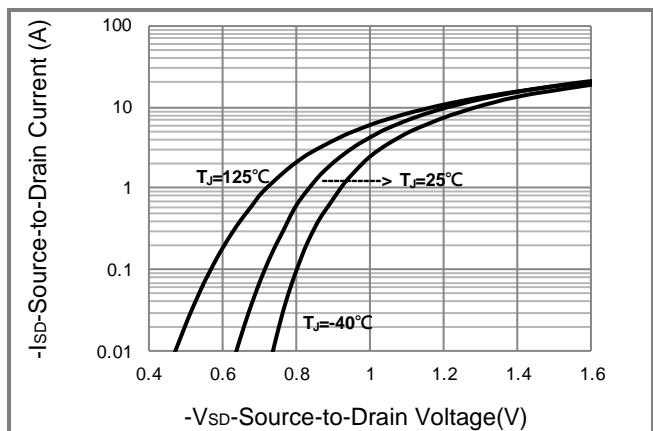


Fig.6 Source-Drain Diode Forward Voltage



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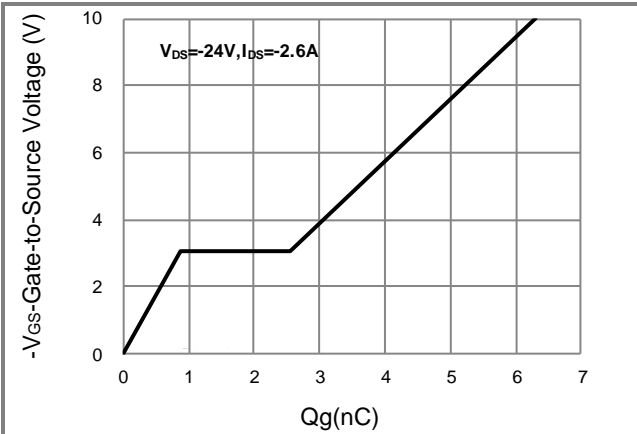


Fig.7 Gate-Charge Characteristics

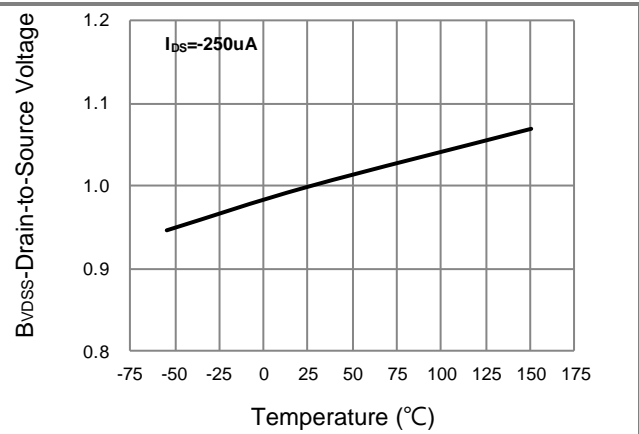


Fig.8 Breakdown Voltage Variation vs. Temperature

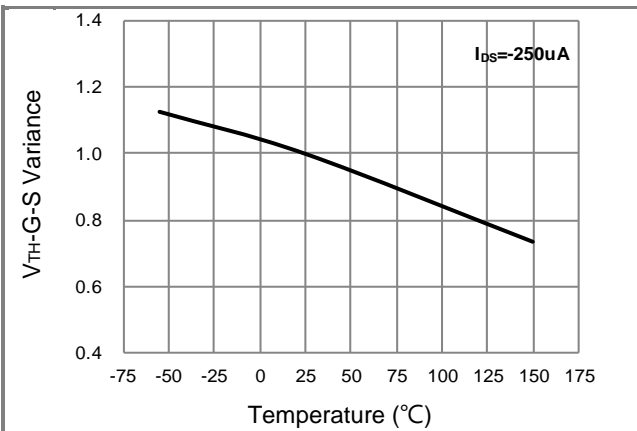


Fig.9 Threshold Voltage Variation with Temperature

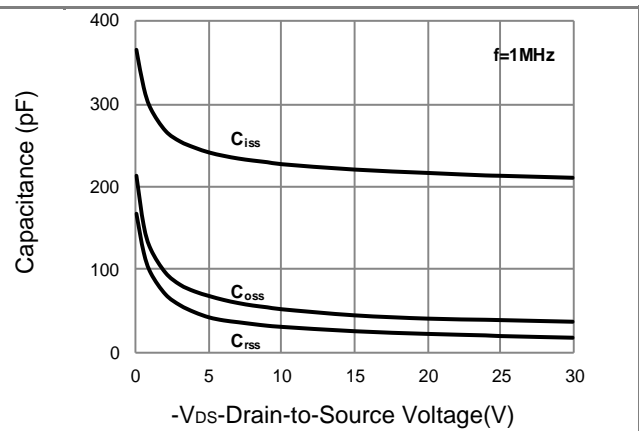


Fig.10 Capacitance vs. Drain-Source Voltage

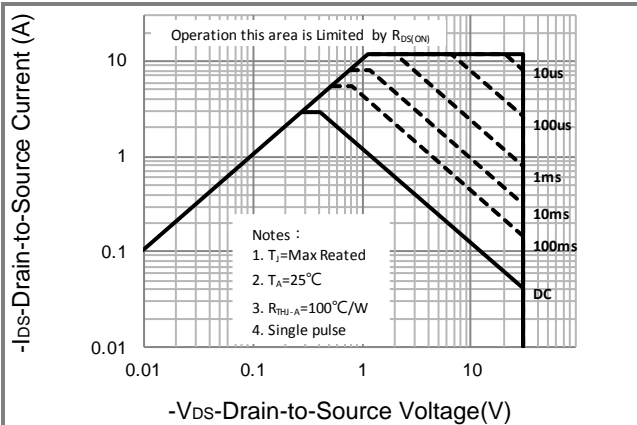


Fig.11 Maximum Safe Operating Area

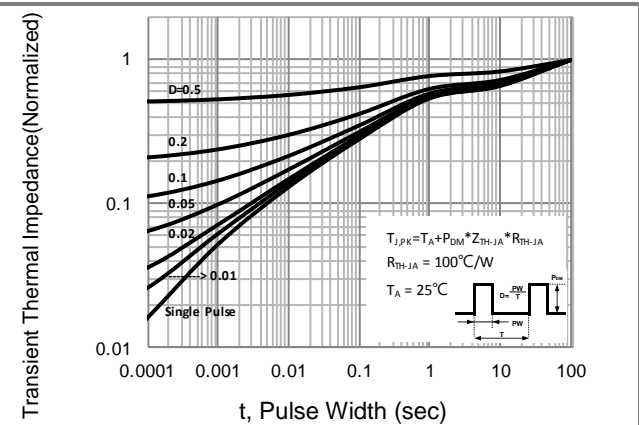


Fig.12 Normalized Transient Thermal Impedance

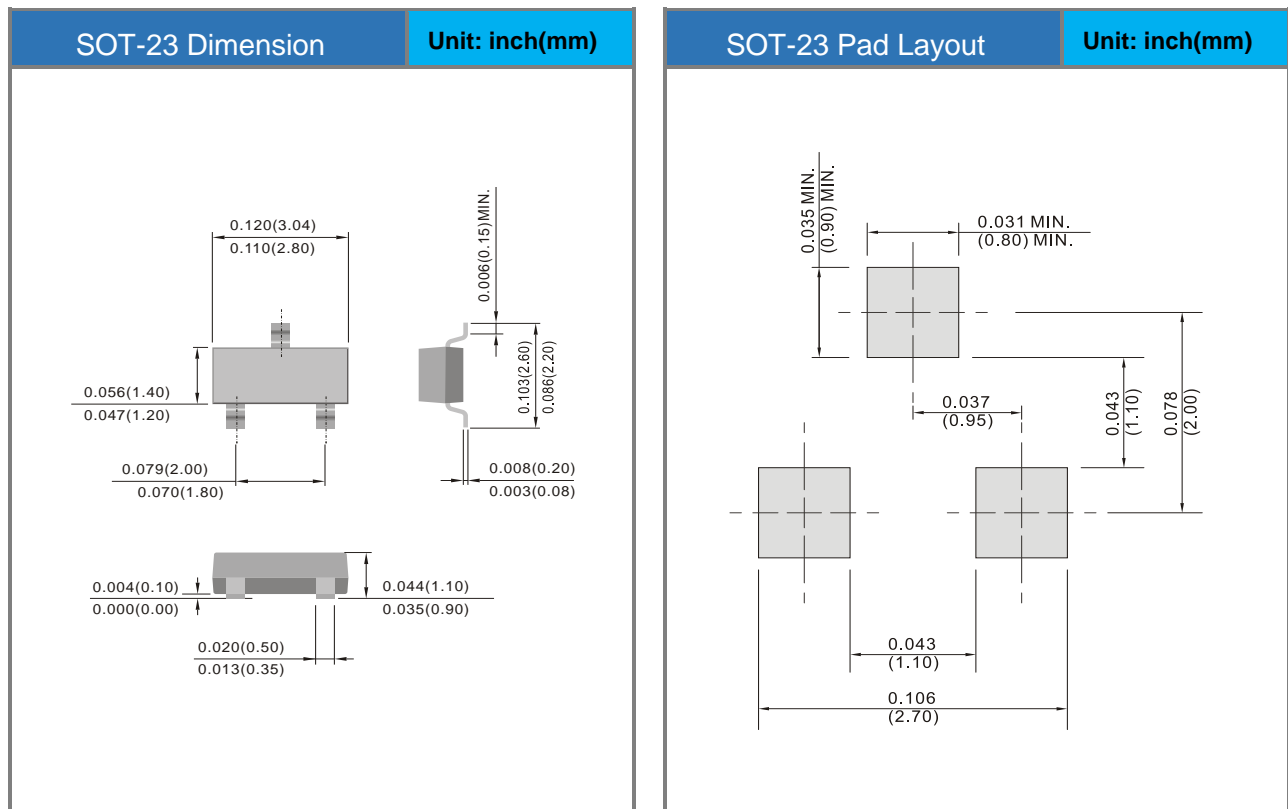


PJA3409E

Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJA3409E_R1_00001	SOT-23	3K pcs / 7" reel	09E	Halogen free RoHS compliant

Packaging Information & Mounting Pad Layout





PJA3409E

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