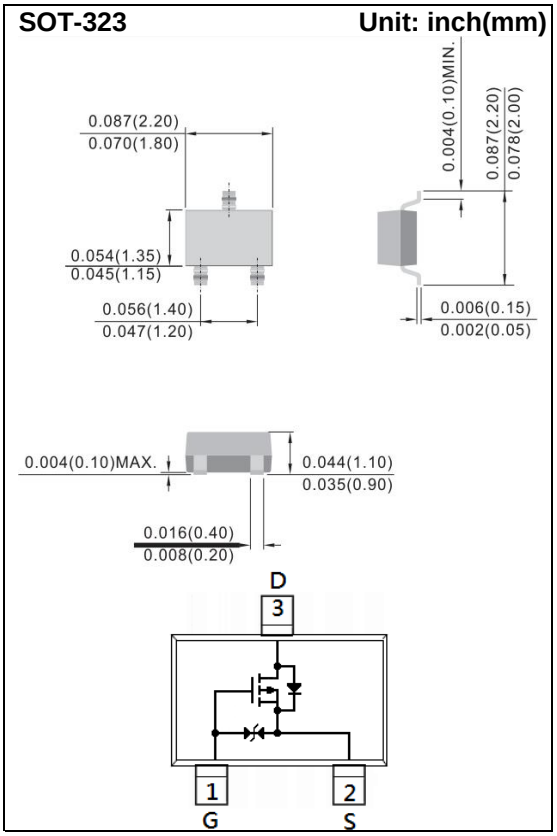
PJC7409

20V P-Channel Enhancement Mode MOSFET

Voltage	-20 V	Current	-500mA



Features

- Low Voltage Drive (1.2V).
- Advanced Trench Process Technology
- Specially Designed for Load switch, PWM Application, etc.
- 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-323 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.00018 ounces, 0.005 grams
- Marking : C09

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current		I_D	-500	mA
Pulsed Drain Current (Note 4)		I_{DM}	-1000	mA
Power Dissipation	T_a=25°C	P_D	350	mW
	Derate above 25°C		2.8	mW/°C
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C
Typical Thermal resistance - Junction to Ambient (Note 3)		$R_{\theta JA}$	357	°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	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.3	-0.59	-1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-500mA	-	0.85	1.2	Ω
		V_{GS}=-2.5V, I_D=-200mA	-	0.99	1.5	
		V_{GS}=-1.8V, I_D=-100mA	-	1.16	2.2	
		V_{GS}=-1.5V, I_D=-50mA	-	1.33	3.6	
		V_{GS}=-1.2V, I_D=-10mA	-	1.5	6.0	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V	-	-	-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V	-	±2	±10	uA
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-500mA, V_{GS}=-4.5V (Note 1,2)	-	1.4	-	nC
Gate-Source Charge	Q_{gs}		-	0.19	-	
Gate-Drain Charge	Q_{gd}		-	0.2	-	
Input Capacitance	Ciss	V_{DS}=-10V, V_{GS}=0V, f=1.0MHZ	-	38	-	pF
Output Capacitance	Coss		-	15	-	
Reverse Transfer Capacitance	Crss		-	9	-	
Turn-On Delay Time	$td_{(on)}$	V_{DD}=-10V, I_D=-500mA, V_{GS}=-4.5V, R_G=6Ω (Note 1,2)	-	7.2	-	ns
Turn-On Rise Time	tr		-	21	-	
Turn-Off Delay Time	$td_{(off)}$		-	85	-	
Turn-Off Fall Time	tf		-	116	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	-500	mA
Diode Forward Voltage	V_{SD}	I_S=-500mA, V_{GS}=0V	-	-0.93	-1.3	V

NOTES :

1. Pulse width≤300us, Duty cycle≤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 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

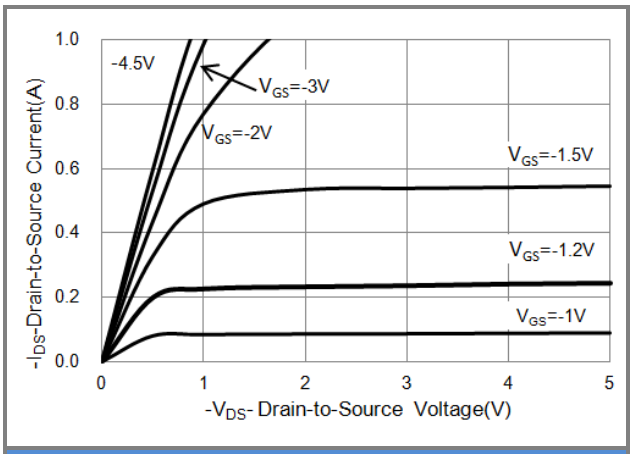

Fig.1 On-Region Characteristics

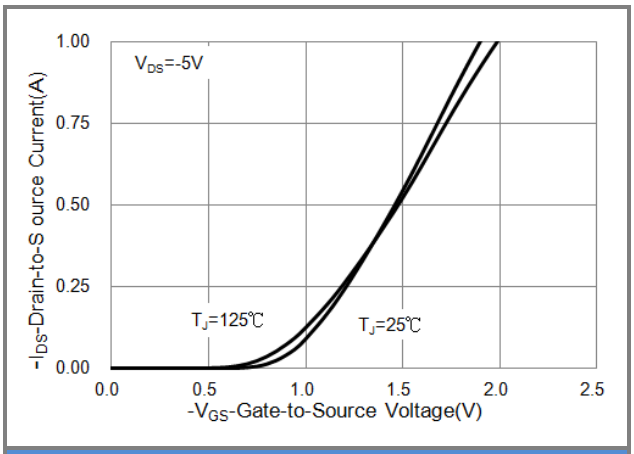

Fig.2 Transfer Characteristics

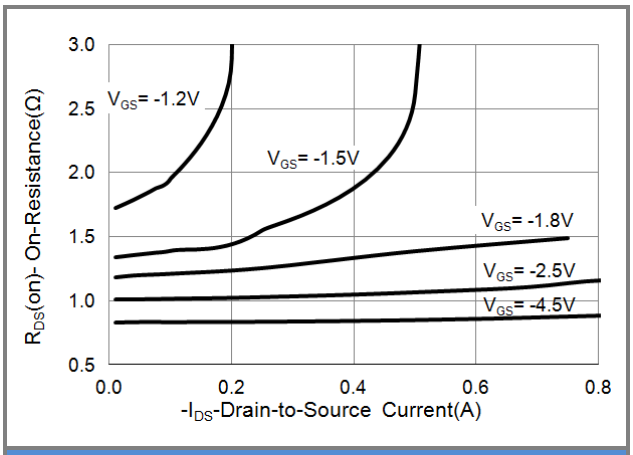

Fig.3 On-Resistance vs. Drain Current

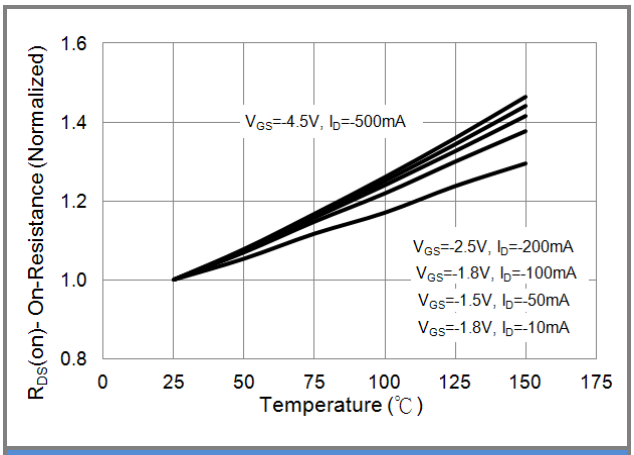

Fig.4 On-Resistance vs. Junction temperature

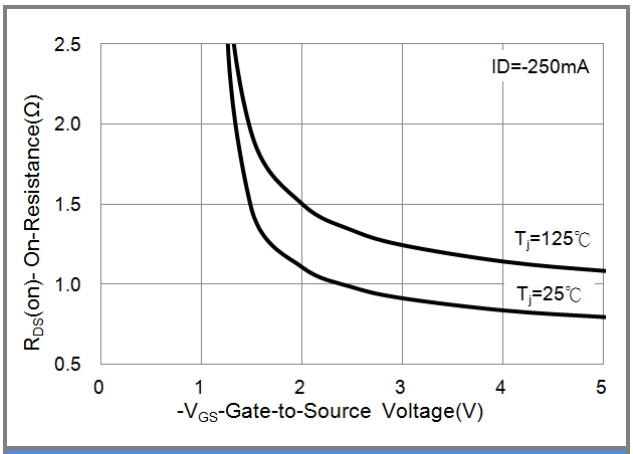

Fig.5 On-Resistance Variation with VGS.

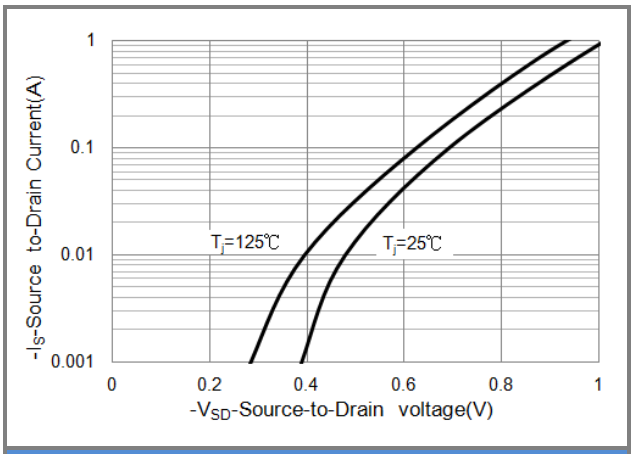

Fig.6 Body Diode Characteristics

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TYPICAL CHARACTERISTIC CURVES

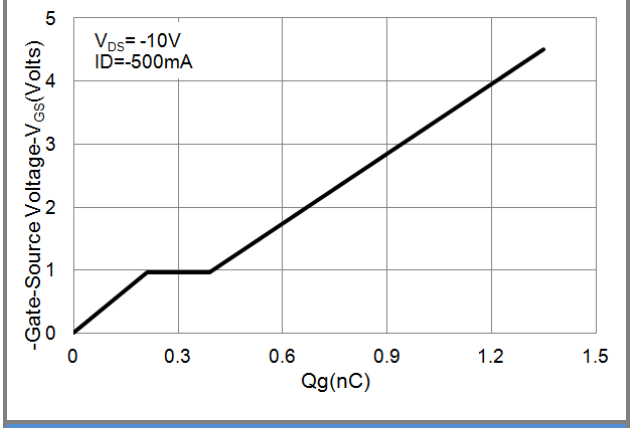


Fig.7 Gate-Charge Characteristics

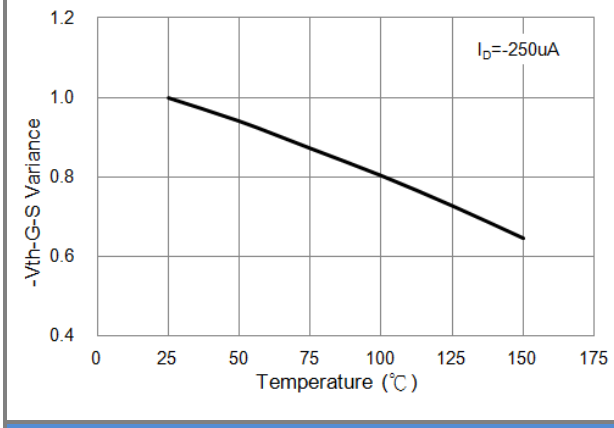


Fig.8 Threshold Voltage Variation with Temperature.

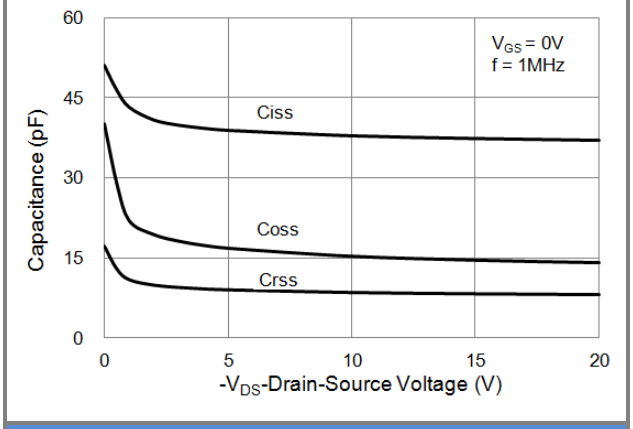


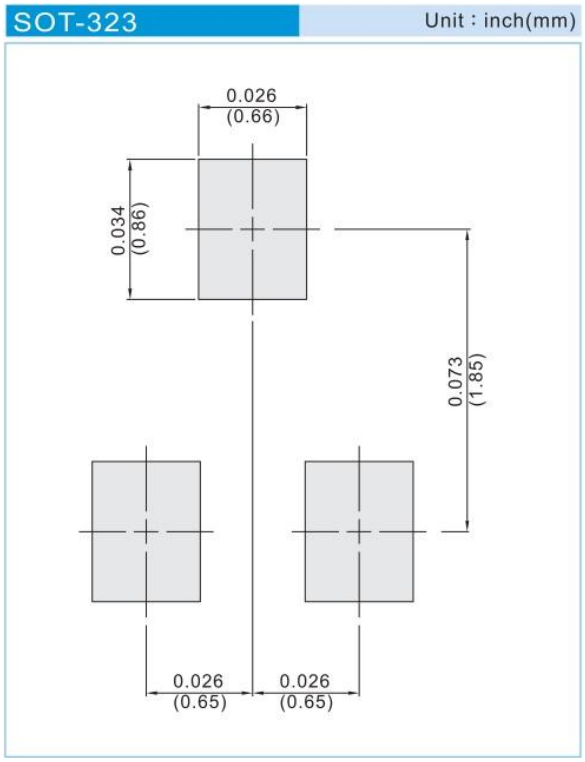
Fig.9 Threshold Voltage Variation with Temperature.

PJC7409

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJC7409_R1_00001	SOT-323	3K pcs / 7” reel	C09	Halogen free
PJC7409_R2_00001	SOT-323	12K pcs / 13” reel	C09	Halogen free

MOUNTING PAD LAYOUT



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