PJ09N03D

25V N-Channel Enhancement Mode MOSFET

FEATURES

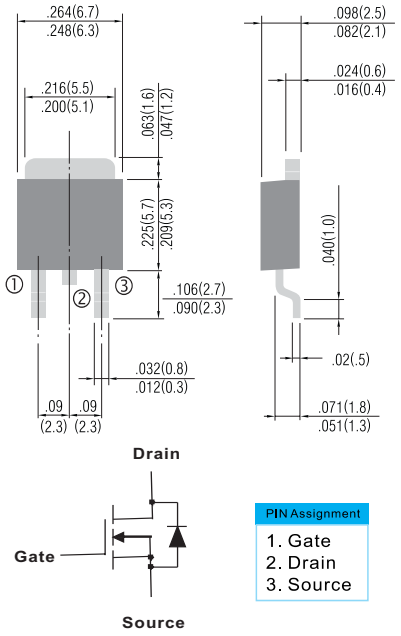
- $R_{DS(ON)}$, V_{GS}@10V,I_{DS}@30A=9mΩ
- $R_{DS(ON)}$, V_{GS}@4.5V,I_{DS}@30A=16mΩ

- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Specially Designed for DC/DC Converters and Motor Drivers
- Fully Characterized Avalanche Voltage and Current
- In compliance with EU RoHS 2002/95/EC directives

MECHANICALDATA

- Case: TO-252 Molded Plastic
- Terminals : Solderable per MIL-STD-750,Method 2026
- Marking : 09N03D

DPAK / TO-252 Unit: inch (mm)



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

PARAMETER	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	25	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	50	A
Pulsed Drain Current [1]	I_{DM}	240	A
Maximum Power Dissipation T_A=25°C T_A=75°C	P_D	52 31	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to + 150	°C
Avalanche Energy with Single Pulse ID=27A, VDD=25V, L=0.5mH	E_{AS}	180	mJ
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	2.4	°C/W
Junction-to Ambient Thermal Resistance(PCB mounted)[2]	$R_{\theta JA}$	50	°C/W

Note: 1. Maximum DC current limited by the package
2. Surface mounted on FR4 board, t ≤ 10 sec

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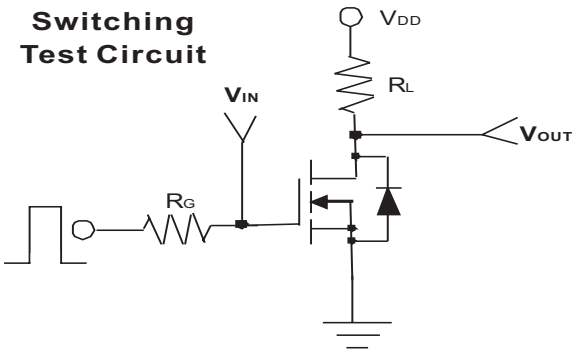
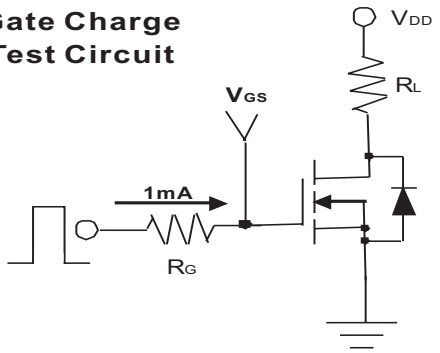
ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	25	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=30A	-	12.5	16.0	mΩ
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=30A	-	6.5	9.0	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=25V, V_{GS}=0V	-	-	1	uA
Gate Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Forward Transconductance	g_{fS}	V_{DS}=10V, I_D=15A	30	-	-	S
Dynamic						
Total Gate Charge	Q_g	V_{DS}=15V,I_D=15A,V_{GS}=5V	-	22.1	-	nC
		V_{DS}=15V, I_D=15A V_{GS}=10V	-	39.0	-	
Gate-Source Charge	Q_{gs}		-	6.0	-	
Gate-Drain Charge	Q_{gd}		-	7.6	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=15V , R_L=15Ω I_D=1A , V_{GEN}=10V R_G=3.6Ω	-	13.0	14.6	ns
Turn-On Rise Time	t_{rr}		-	10.4	12.4	
Turn-Off Delay Time	$t_{d(off)}$		-	41.2	48.6	
Turn-Off Fall Time	t_f		-	13.4	15.8	
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V f=1.0MH_Z	-	2100	-	pF
Output Capacitance	C_{oss}		-	450	-	
Reverse Transfer Capacitance	C_{rss}		-	300	-	
Source-Drain Diode						
Max. Diode Forward Current	I_s	-	-	-	50	A
Diode Forward Voltage	V_{SD}	I_S=30A , V_{GS}=0V	-	0.91	1.2	V

Switching Test Circuit



Gate Charge Test Circuit



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Typical Characteristics Curves (T_A=25°C, unless otherwise noted)

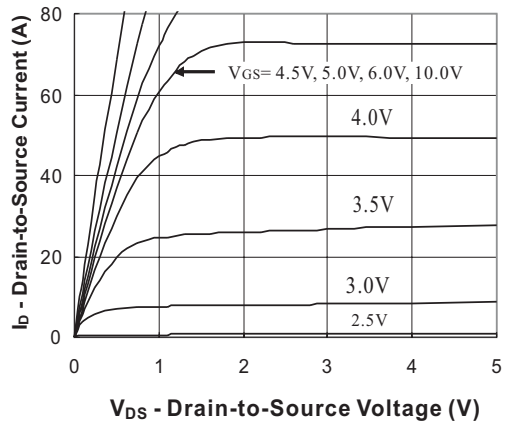

FIG.1- Output Characteristic

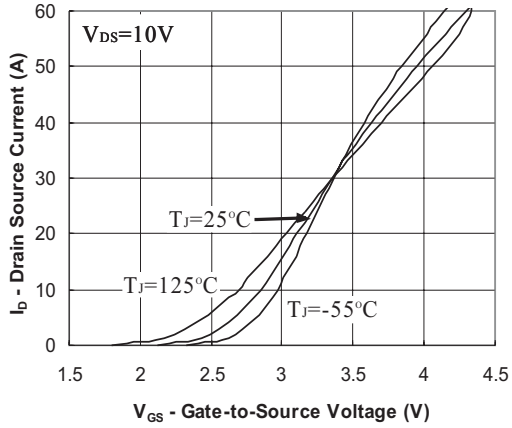

FIG.2- Transfer Characteristic

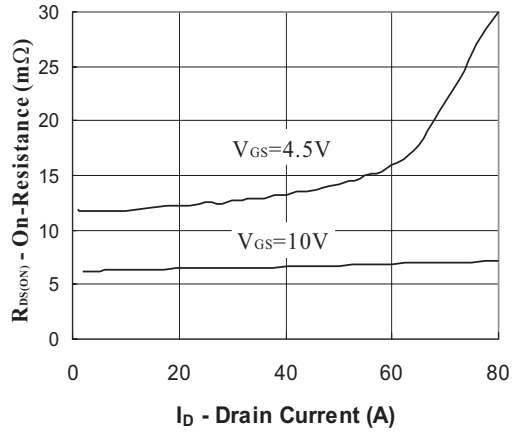

FIG.3- On Resistance vs Drain Current

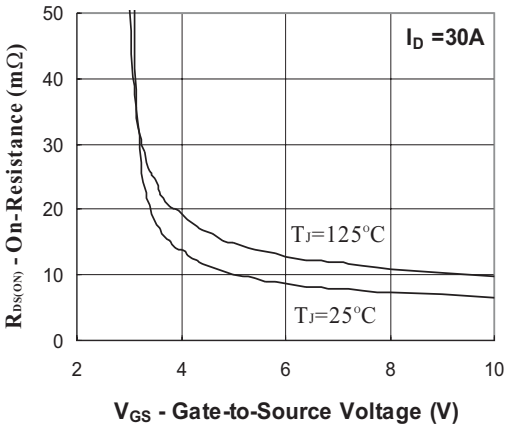

FIG.4- On Resistance vs Gate to Source Voltage

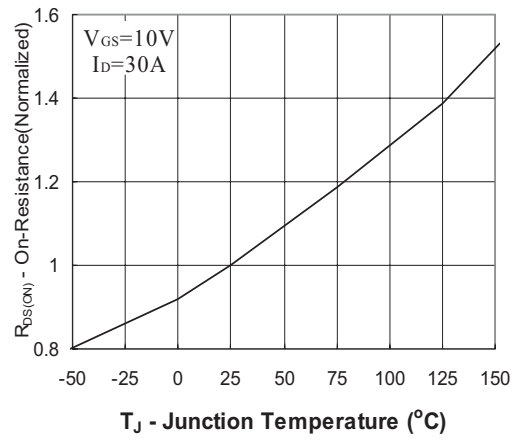

FIG.5- On Resistance vs Junction Temperature

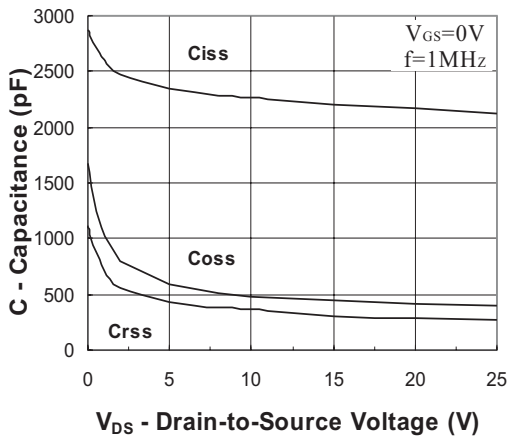

FIG.6- Capacitance

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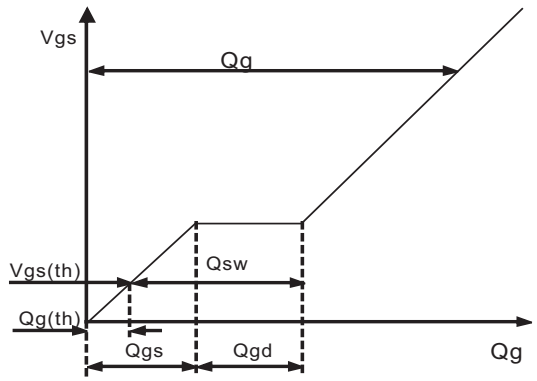

Fig.7 - Gate Charge Waveform

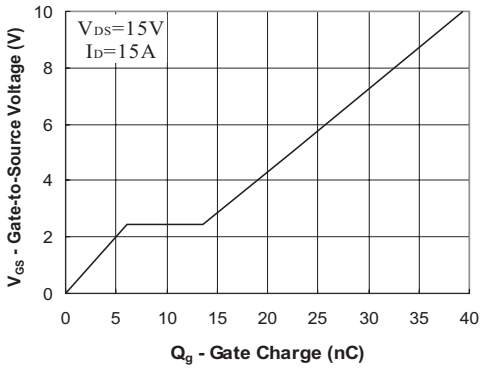

Fig.8 - Gate Charge

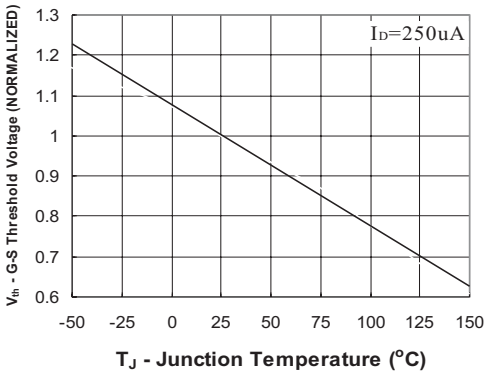

Fig.9 - Threshold Voltage vs Temperature

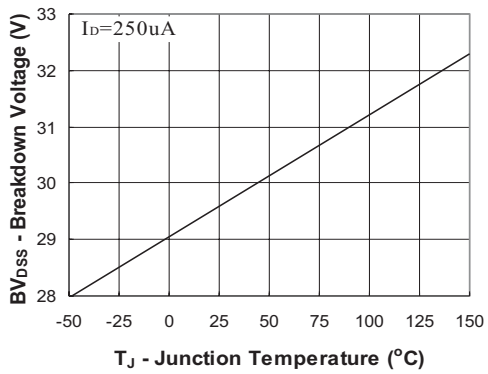

Fig.10 - Breakdown Voltage vs Junction Temperature

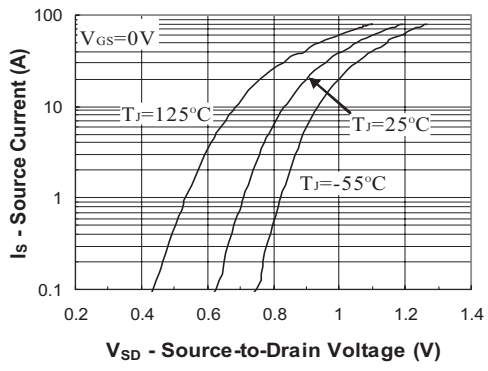

Fig.11 - Source-Drain Diode Forward Voltage