GE09N70

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV_{DSS}	600/650/700V
$R_{DS(ON)}$	0.75Ω
I_D	9A

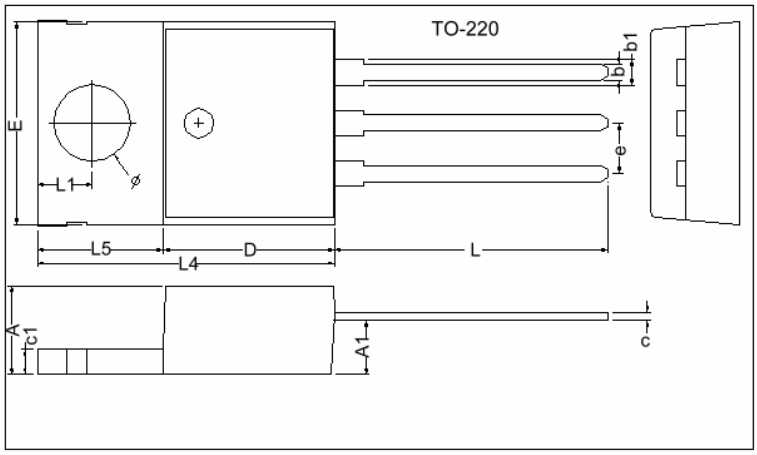
Description

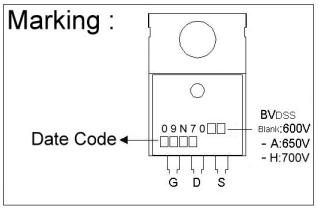
The GE09N70 series are specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications. TO-220 type provide high blocking voltage to overcome voltage surge and sag in the toughest power system with the best combination of fast switching, ruggedized design and cost-effectiveness. The TO-220 package is universally preferred for all commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.

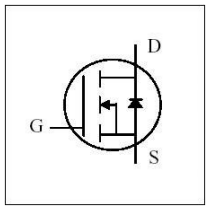
Features

*Dynamic dv/dt Rating
*Simple Drive Requirement
*Repetitive Avalanche Rated
*Fast Switching Speed

Package Dimensions







REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c1	1.25	1.45
b	0.76	1.00	b1	1.17	1.47
c	0.36	0.50	L	13.25	14.25
D	8.60	9.00	e	2.54 REF.	
E	9.80	10.4	L1	2.60	2.89
L4	14.7	15.3	Ø	3.71	3.96
L5	6.20	6.60	A1	2.60	2.80

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage - /A/H	V_{DS}	600/650/700	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current , V_{GS}@10V	I_D @Tc=25℃	9	A
Continuous Drain Current , V_{GS}@10V	I_D @Tc=100℃	5	A
Pulsed Drain Current[1]	I_{DM}	40	A
Total Power Dissipation	P_D @Tc=25℃	156	W
Linear Derating Factor		1.25	W/℃
Single Pulse Avalanche Energy[2]	E_{AS}	305	mJ
Avalanche Current	I_{AR}	9	A
Repetitive Avalanche Energy	E_{AR}	9	mJ
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	℃

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance Junction-case	Max.	Rthj-c	0.8	℃/W
Thermal Resistance Junction-ambient	Max.	Rthj-a	62	℃/W

Electrical Characteristics(Tj = 25℃ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	600	-	-	V	V_{GS}=0, I_D=250uA -
		650	-	-	V	V_{GS}=0, I_D=250uA A
		700	-	-	V	V_{GS}=0, I_D=250uA H
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.6	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	2.0	-	4.0	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	4.5	-	S	V_{DS}=50V, I_D=4.5A
Gate-Source Leakage Current	I_{GSS}	-	-	±1	uA	V_{GS}= ±20V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	100	uA	V_{DS}=600V, V_{GS}=0
Drain-Source Leakage Current(Tj=150℃)		-	-	500	uA	V_{DS}=480V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	0.75	Ω	V_{GS}=10V, I_D=4.5A
Total Gate Charge[3]	Q_g	-	44	-	nC	I_D=9A V_{DS}=480V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	11	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	12	-		
Turn-on Delay Time[3]	$T_{d(on)}$	-	19	-	ns	V_{DD}=300V I_D=9A V_{GS}=10V R_G=10Ω R_D=34Ω
Rise Time	T_r	-	21	-		
Turn-off Delay Time	$T_{d(off)}$	-	56	-		
Fall Time	T_f	-	24	-		
Input Capacitance	C_{iss}	-	2660	-	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	C_{oss}	-	170	-		
Reverse Transfer Capacitance	C_{rss}	-	10	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[3]	V_{SD}	-	-	1.5	V	I_S=9A, V_{GS}=0V, Tj=25℃
Continuous Source Current (Body Diode)	I_S	-	-	9	A	V_D= V_G=0V, V_S=1.5V
Pulsed Source Current (Body Diode)[1]	I_{SM}	-	-	40	A	

Notes: 1. Pulse width limited by safe operating area.

2. Staring Tj=25℃, V_{DD}=50V, L=6.8mH, R_G=25Ω, I_{AS}=9A.

3. Pulse width≦300us, duty cycle≦2%.

Characteristics Curve

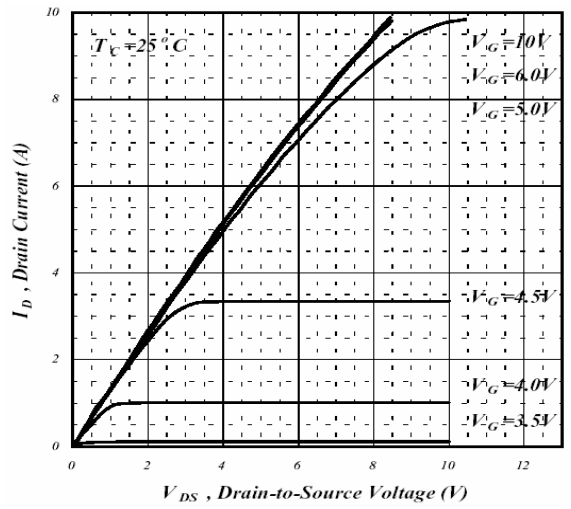


Fig 1. Typical Output Characteristics

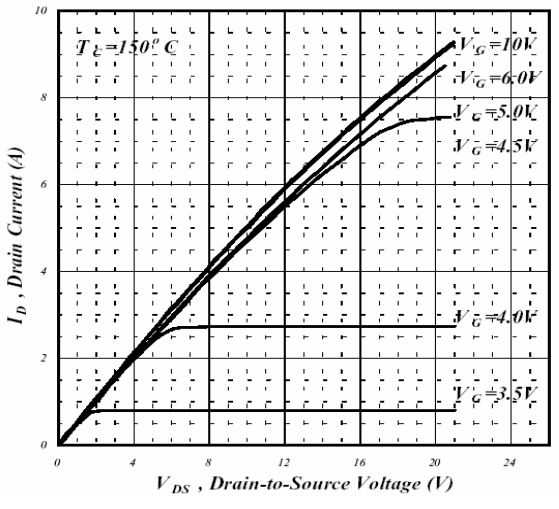


Fig 2. Typical Output Characteristics

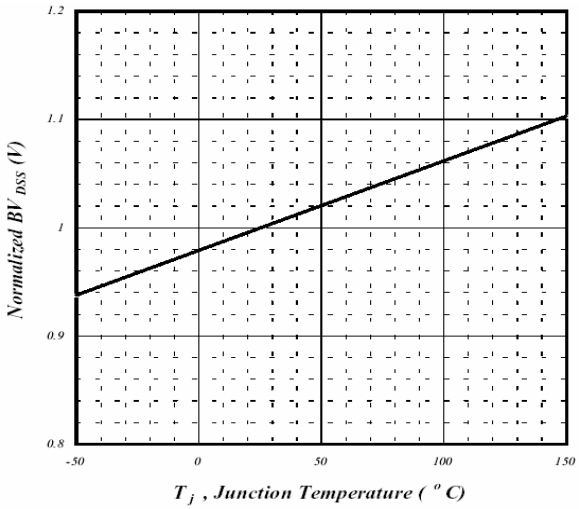


Fig 3. Normalized BVDSS v.s. Junction Temperature

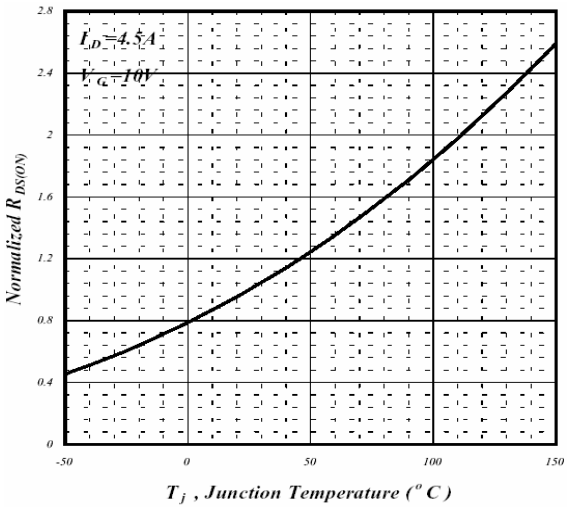


Fig 4. Normalized On-Resistance v.s. Junction Temperature

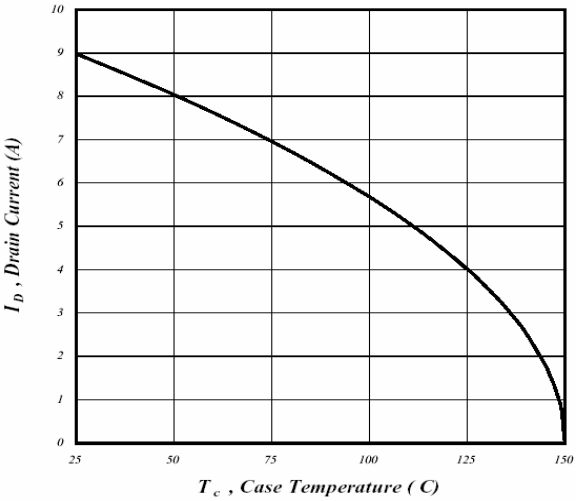


Fig 5. Maximum Drain Current v.s. Case Temperature

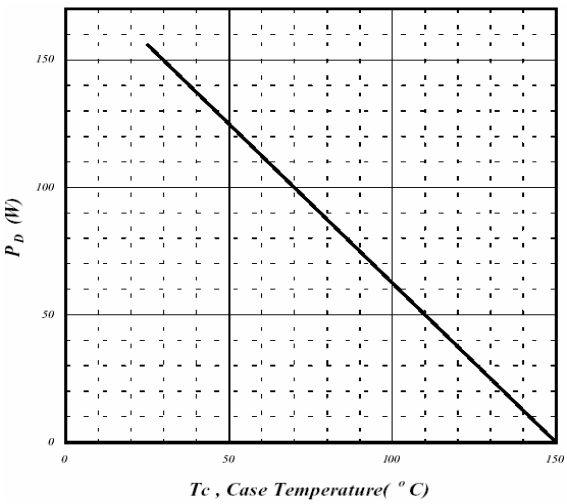


Fig 6. Type Power Dissipation

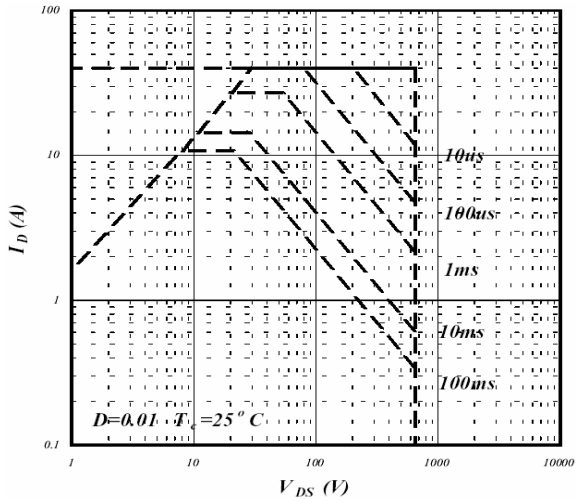


Fig 7. Maximum Safe Operating Area

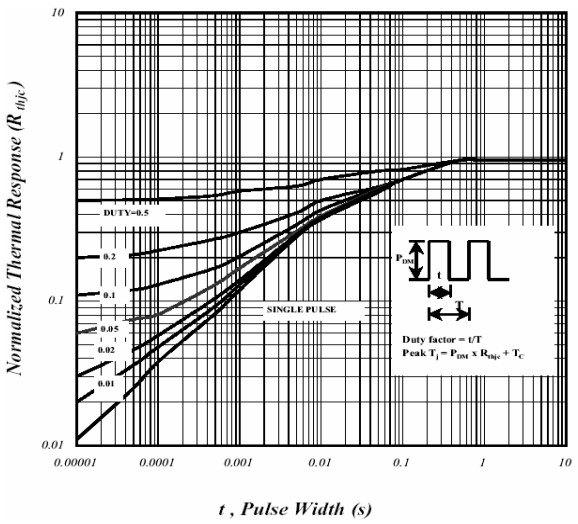


Fig 8. Effective Transient Thermal Impedance

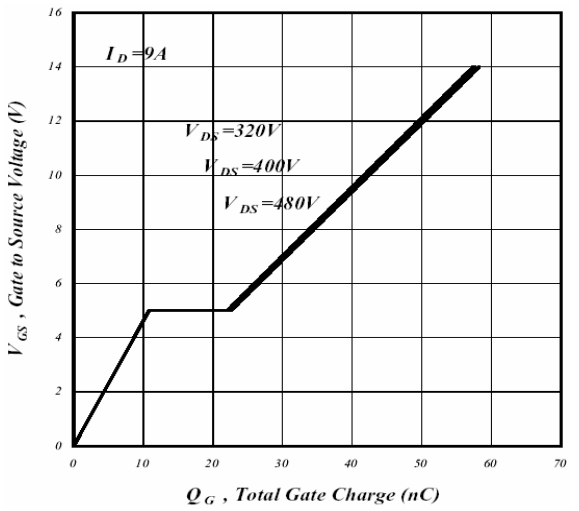


Fig 9. Gate Charge Characteristics

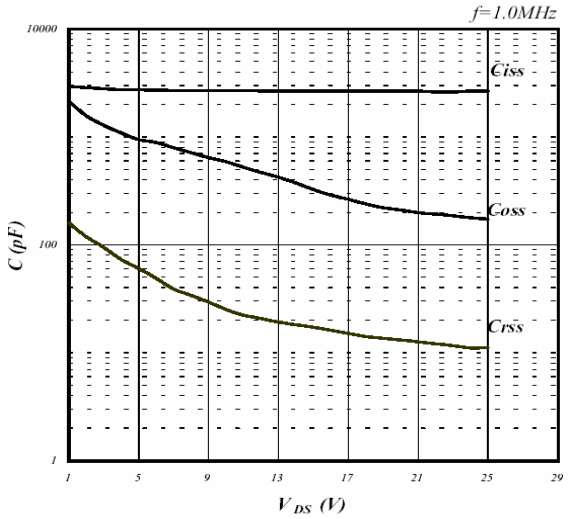


Fig 10. Typical Capacitance Characteristics

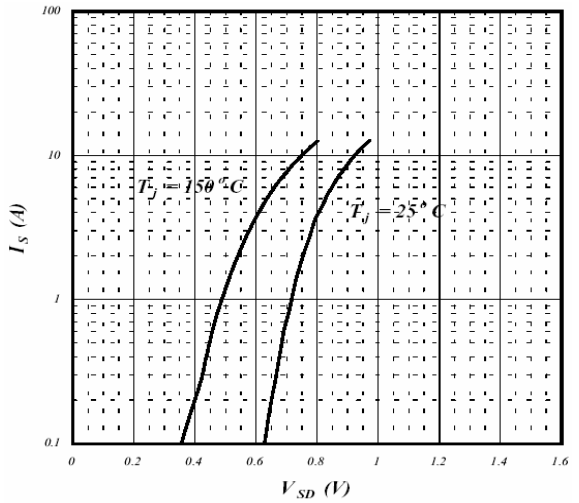


Fig 11. Forward Characteristics of Reverse Diode

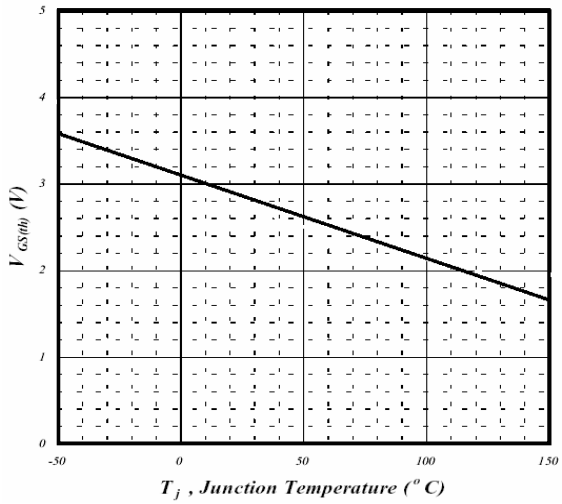


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

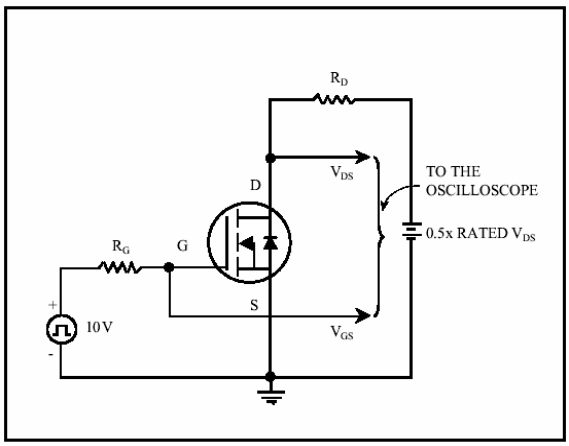


Fig 13. Switching Time Circuit

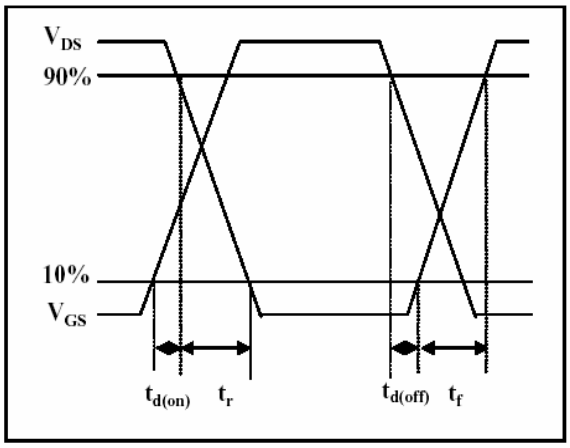


Fig 14. Switching Time Waveform

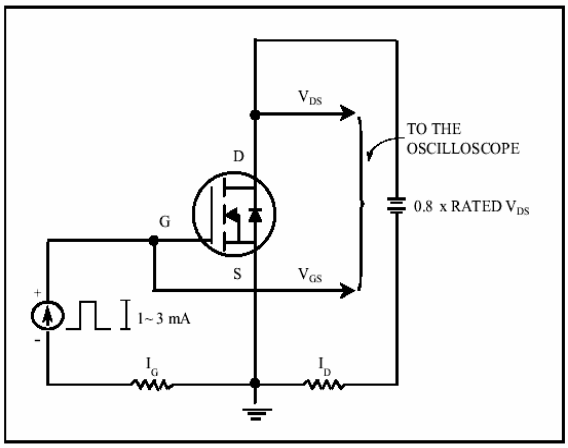


Fig 15. Gate Charge Circuit

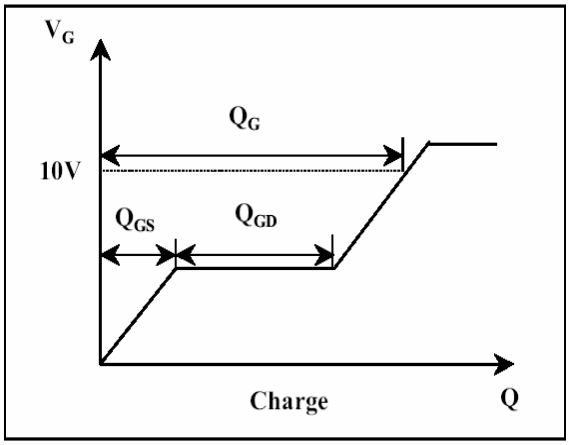


Fig 16. Gate Charge Waveform

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