

GE04N70B**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

BVDSS	650/700V
RDS(ON)	2.4Ω
ID	4A

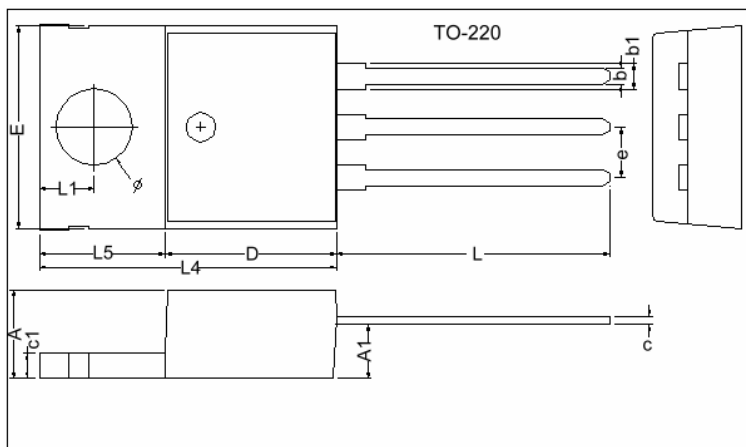
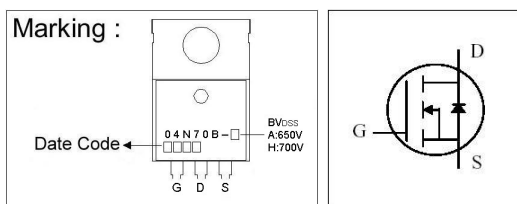
Description

The GE04N70B 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

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

Package Dimensions**Marking :**

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}	650/700	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @ T_C=25^\circ C$	4	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @ T_C=100^\circ C$	2.5	A
Pulsed Drain Current ¹	I_{DM}	15	A
Total Power Dissipation	$P_D @ T_C=25^\circ C$	62.5	W
Linear Derating Factor		0.5	W/°C
Single Pulse Avalanche Energy ²	E_{AS}	100	mJ
Avalanche Current	I_{AR}	4	A
Repetitive Avalanche Energy	E_{AR}	4	mJ
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case	Max. R_{thj-c}	2.0	°C/W
Thermal Resistance Junction-ambient	Max. R_{thj-a}	62	°C/W

Electrical Characteristics(T_j = 25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	650	-	-	V	V _{GS} =0, I _D =250uA A
		700	-	-	V	V _{GS} =0, I _D =250uA H
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _j	-	0.6	-	V/°C	Reference to 25°C, 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}	-	2.5	-	S	V _{DS} =50V, I _D =2A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	100	uA	V _{DS} =600V, V _{GS} =0
Drain-Source Leakage Current(T _j =150°C)		-	-	500	uA	V _{DS} =480V, V _{GS} =0
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	2.4	Ω	V _{GS} =10V, I _D =2A
Total Gate Charge ³	Q _g	-	16.7	-	nC	I _D =4A V _{DS} =480V V _{GS} =10V
Gate-Source Charge	Q _{gs}	-	4.1	-		
Gate-Drain ("Miller") Charge	Q _{gd}	-	4.9	-		
Turn-on Delay Time ³	T _{d(on)}	-	11	-	ns	V _{DD} =300V I _D =4A V _{GS} =10V R _G =10Ω R _D =75Ω
Rise Time	T _r	-	8.3	-		
Turn-off Delay Time	T _{d(off)}	-	23.8	-		
Fall Time	T _f	-	8.2	-		
Input Capacitance	C _{iss}	-	950	-	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	65	-		
Reverse Transfer Capacitance	C _{rss}	-	6	-		

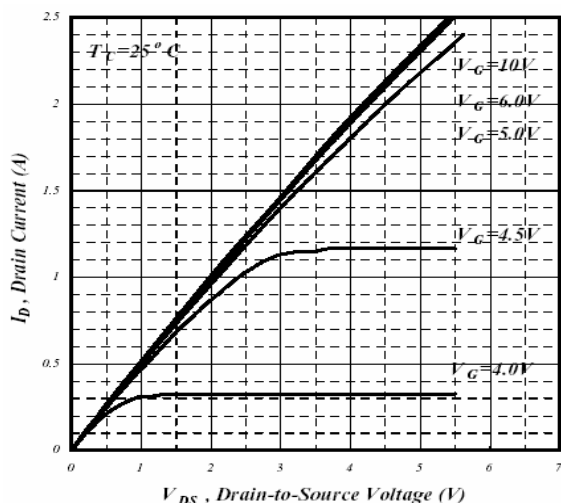
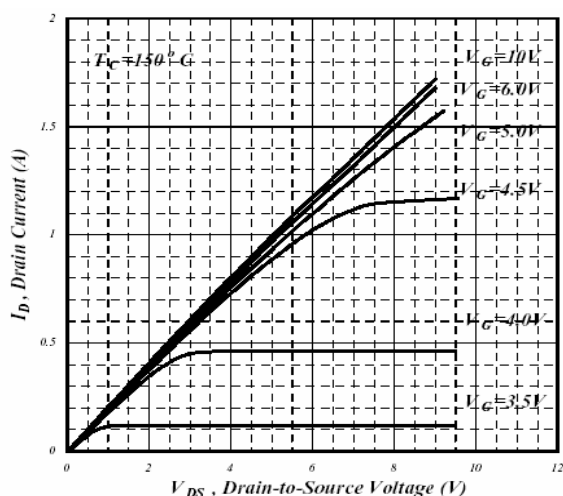
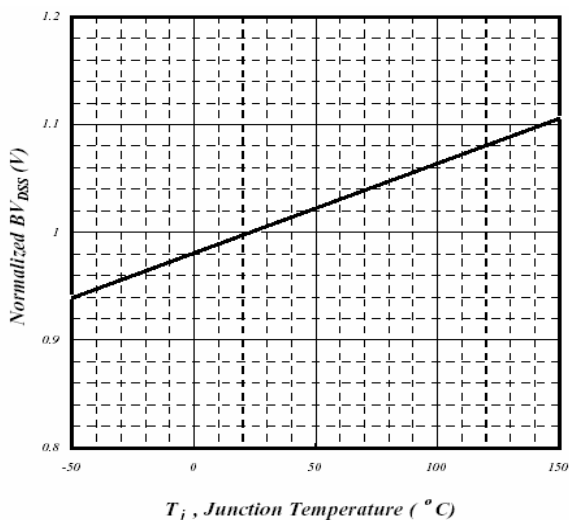
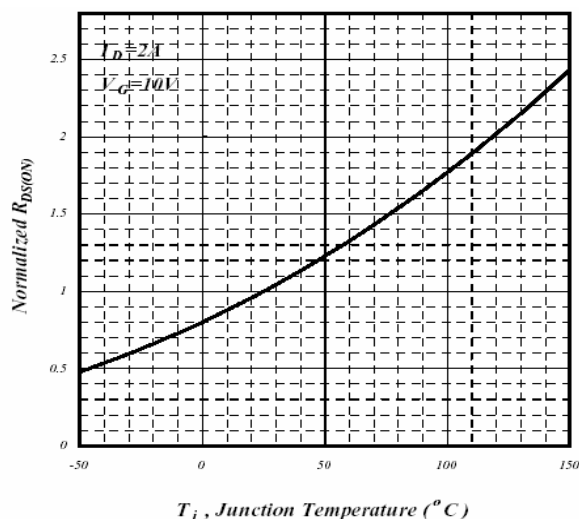
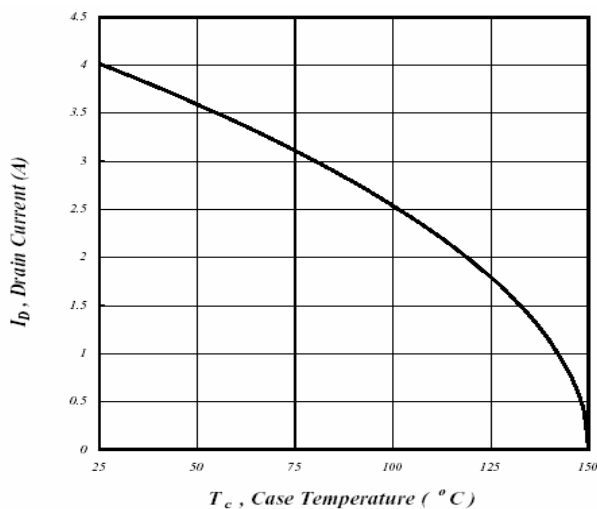
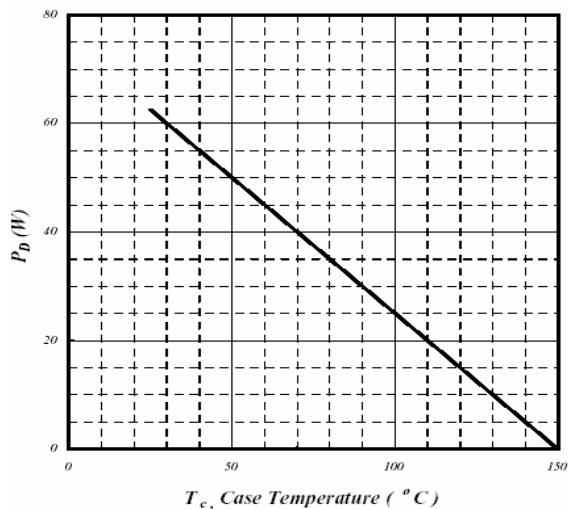
Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ³	V _{SD}	-	-	1.5	V	I _S =4A, V _{GS} =0V, T _j =25°C
Continuous Source Current(Body Diode)	I _S	-	-	4	A	V _D = V _G =0V, V _S =1.5V
Pulsed Source Current (Body Diode) ¹	I _{SM}	-	-	15	A	

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

 2. Staring T_j=25°C, V_{DD}=50V, L=25mH, R_G=25Ω, I_{AS}=4A.

3. Pulse width ≤ 300us, duty cycle ≤ 2%.

Characteristics Curve**Fig 1. Typical Output Characteristics****Fig 2. Typical Output Characteristics****Fig 3. Normalized BV_{DS} v.s. Junction Temperature****Fig 4. Normalized On-Resistance v.s. Junction Temperature****Fig 5. Maximum Drain Current v.s. Case Temperature****Fig 6. Typical Power Dissipation**

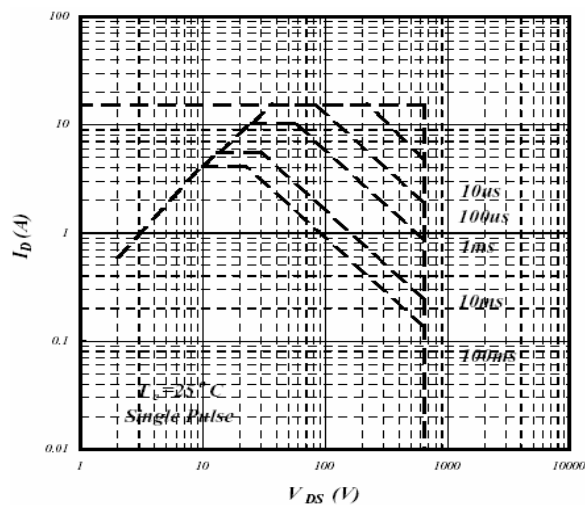


Fig 7. Maximum Safe Operating Area

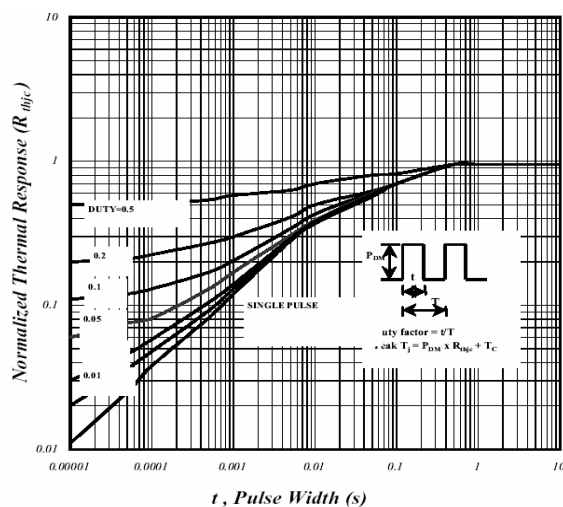


Fig 8. Effective Transient Thermal Impedance

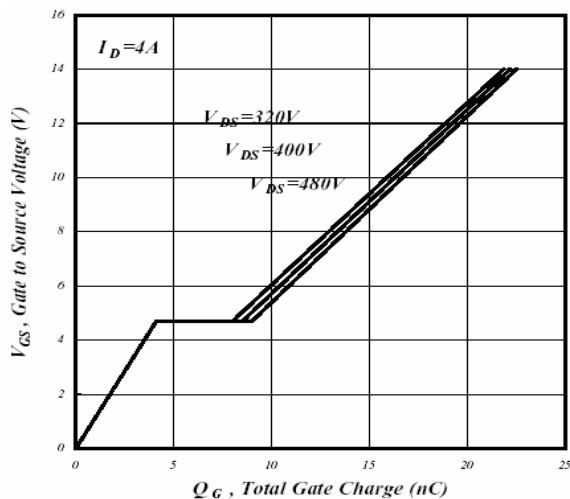


Fig 9. Gate Charge Characteristics

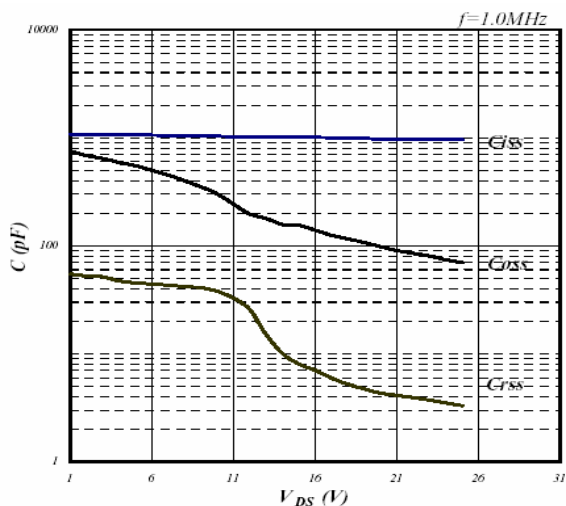


Fig 10. Typical Capacitance Characteristics

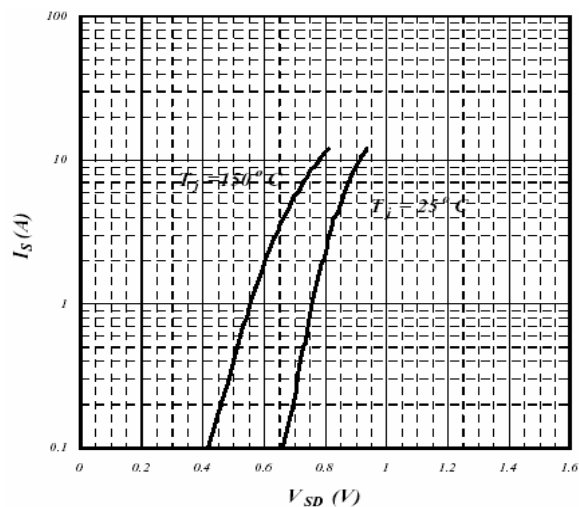


Fig 11. Forward Characteristics of Reverse Diode

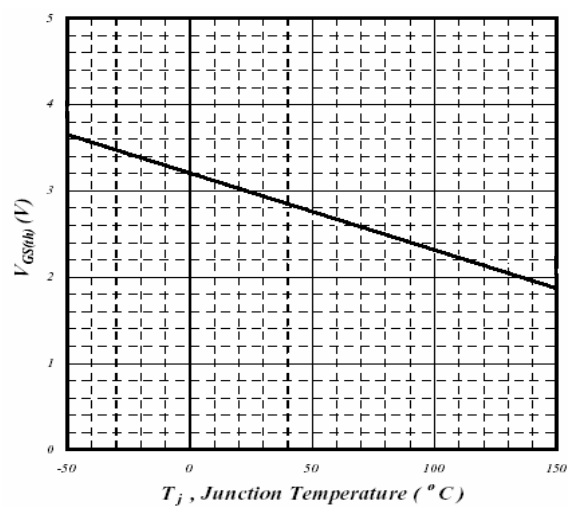
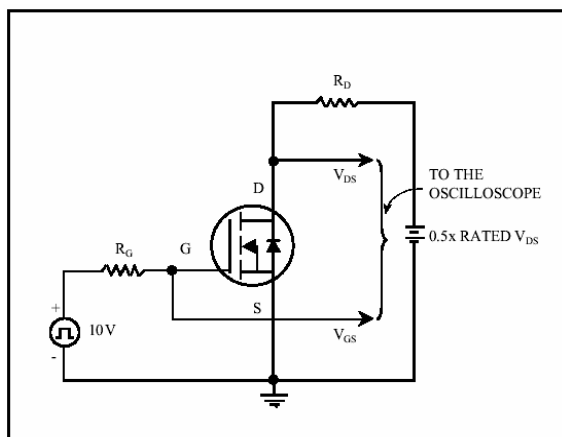
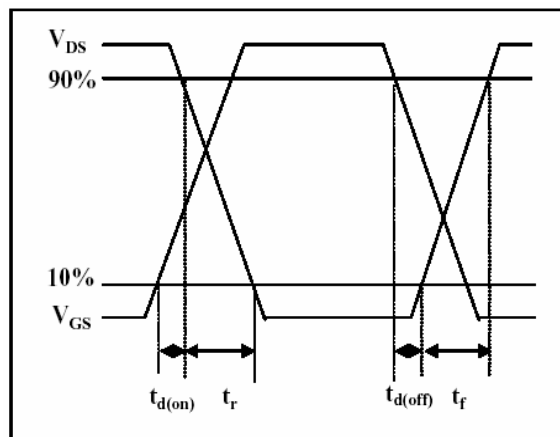
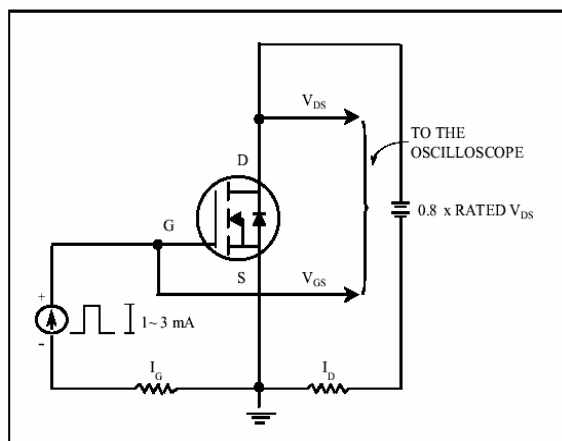
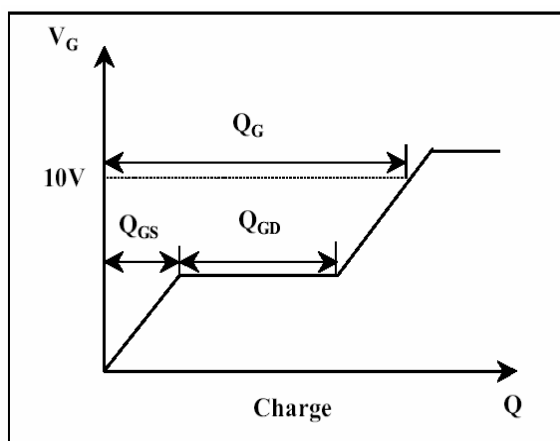


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

**Fig 13. Switching Time Circuit****Fig 14. Switching Time Waveform****Fig 15. Gate Charge Circuit****Fig 16. Gate Charge Waveform****Important Notice:**

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