

# GE02N60

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	600V
RDS(ON)	9Ω
ID	2A

### Description

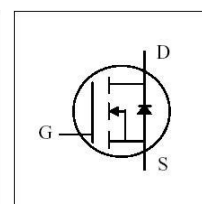
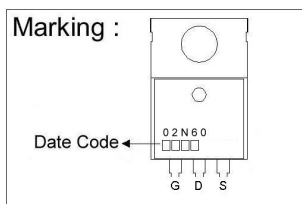
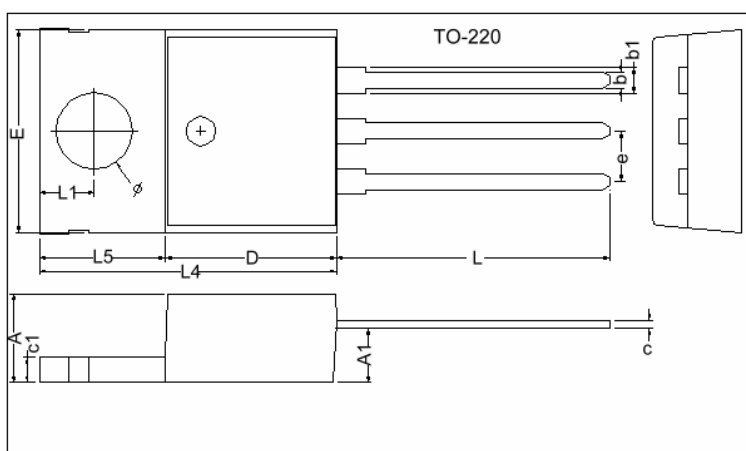
The GE02N60 provide the designer with the best combination of fast switching.

The TO-220 package is universally preferred for all commercial-industrial applications. The device is suited for DC-DC, DC-AC converters for telecom, industrial and consumer environment.

### Features

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

### 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	∅	3.71	3.96
L5	6.20	6.60	A1	2.60	2.80

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^{\circ}C$	2	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^{\circ}C$	1.26	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	6	A
Total Power Dissipation	$P_D @T_C=25^{\circ}C$	39	W
Linear Derating Factor		0.31	W/°C
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	200	mJ
Avalanche Current	$I_{AR}$	2	A
Repetitive Avalanche Energy	$E_{AR}$	2	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.	Rthj-c	3.2	°C/W
Thermal Resistance Junction-ambient Max.	Rthj-a	62	°C/W

## Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	0.6	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	2.0	-	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Forward Transconductance	g <sub>fs</sub>	-	0.8	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =1A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	100	uA	V <sub>DS</sub> =600V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =150°C)		-	-	500	uA	V <sub>DS</sub> =480V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	9.0	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =1A
Total Gate Charge <sup>3</sup>	Q <sub>g</sub>	-	13.9	-	nC	I <sub>D</sub> =2A V <sub>DS</sub> =480V V <sub>GS</sub> =10V
Gate-Source Charge	Q <sub>gs</sub>	-	1.9	-		
Gate-Drain ("Miller") Change	Q <sub>gd</sub>	-	8.2	-		
Turn-on Delay Time <sup>3</sup>	T <sub>d(on)</sub>	-	8.8	-	ns	V <sub>DD</sub> =300V I <sub>D</sub> =2A V <sub>GS</sub> =10V R <sub>G</sub> =10Ω R <sub>D</sub> =150Ω
Rise Time	T <sub>r</sub>	-	10	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	21.3	-		
Fall Time	T <sub>f</sub>	-	8.8	-		
Input Capacitance	C <sub>iss</sub>	-	155	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	27	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	14	-		

## Source-Drain Diode

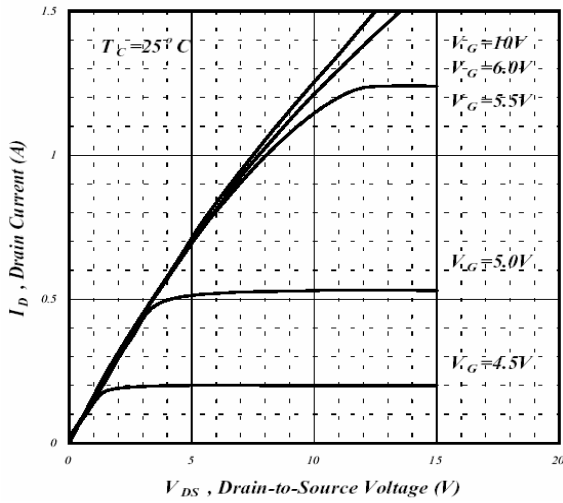
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>3</sup>	V <sub>SD</sub>	-	-	1.5	V	I <sub>S</sub> =2A, V <sub>GS</sub> =0V, T <sub>j</sub> =25°C
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	2	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.5V
Pulsed Source Current (Body Diode) <sup>1</sup>	I <sub>SM</sub>	-	-	6	A	

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

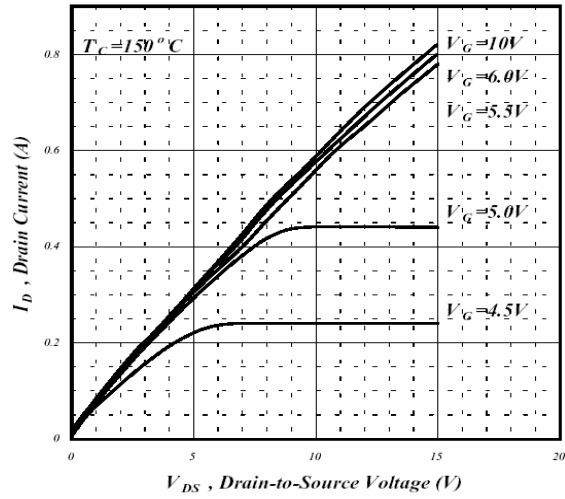
2. Starting T<sub>j</sub>=25°C, V<sub>DD</sub>=50V, L=100mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=2A.

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

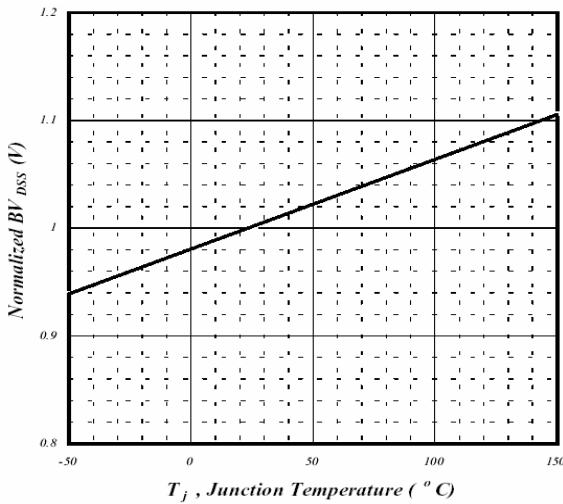
**Characteristics Curve**



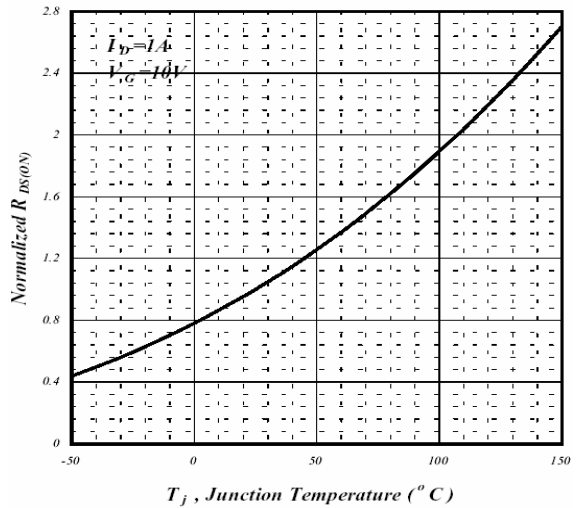
**Fig 1. Typical Output Characteristics**



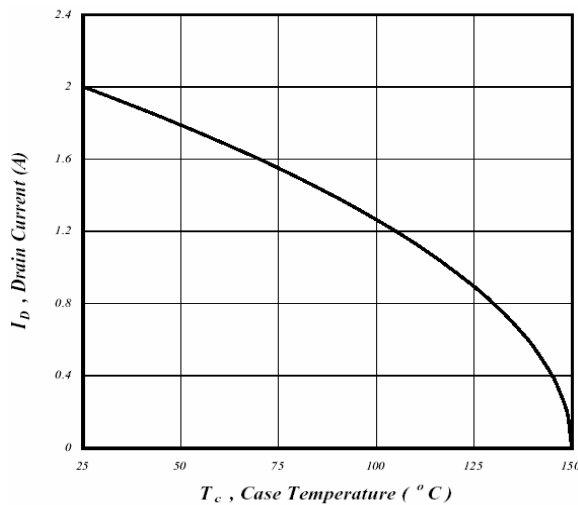
**Fig 2. Typical Output Characteristics**



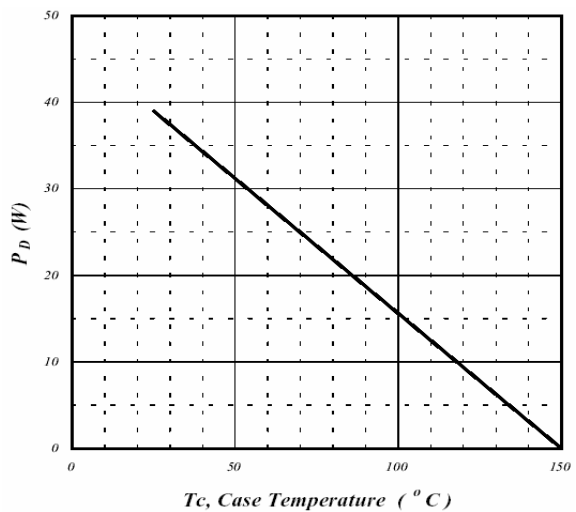
**Fig 3. Normalized  $BV_{DSS}$  v.s. Junction Temperature**



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



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



**Fig 6. Type Power Dissipation**

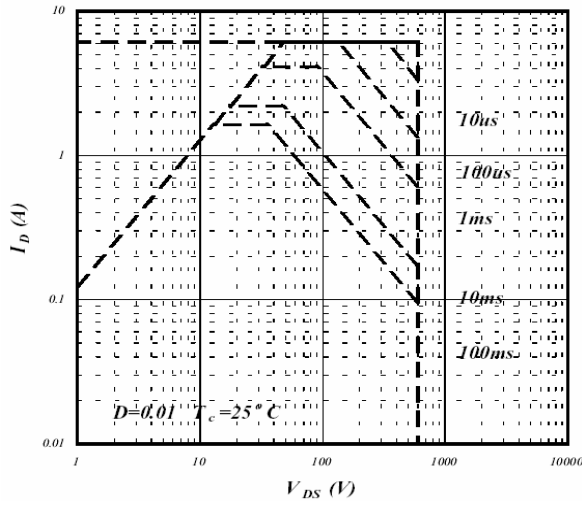


Fig 7. Maximum Safe Operating Area

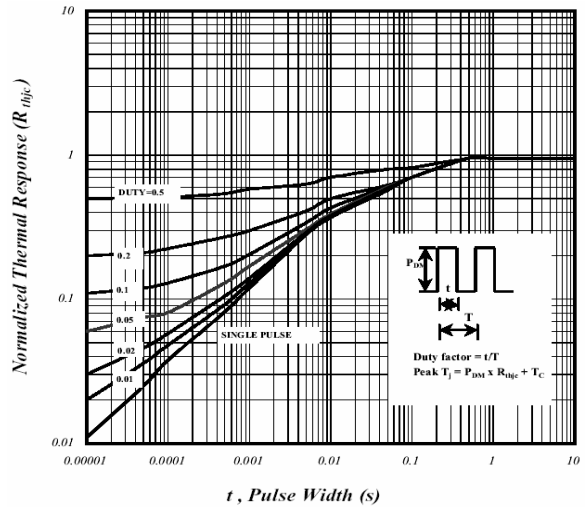


Fig 8. Effective Transient Thermal Impedance

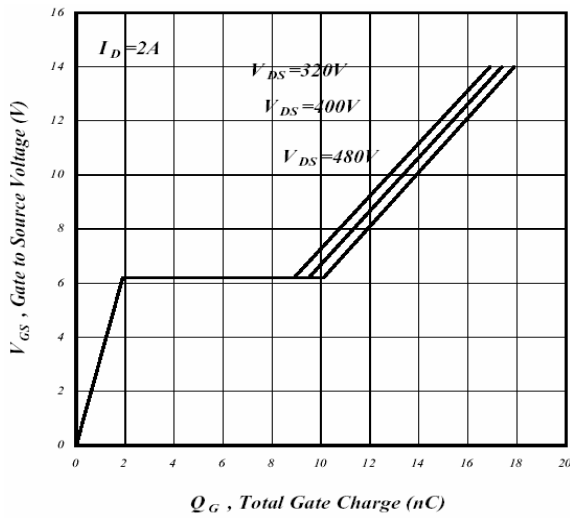


Fig 9. Gate Charge Characteristics

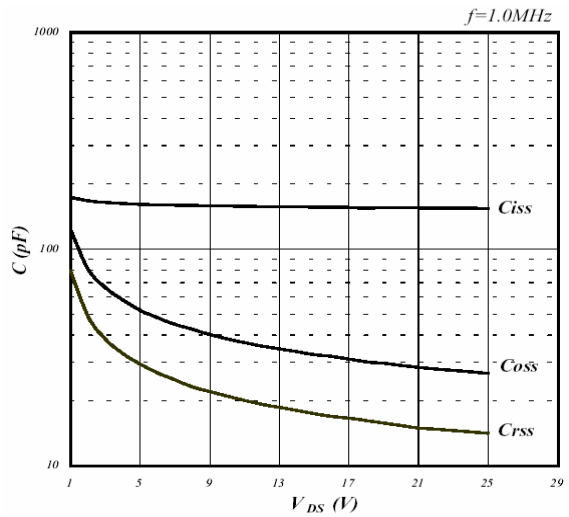


Fig 10. Typical Capacitance Characteristics

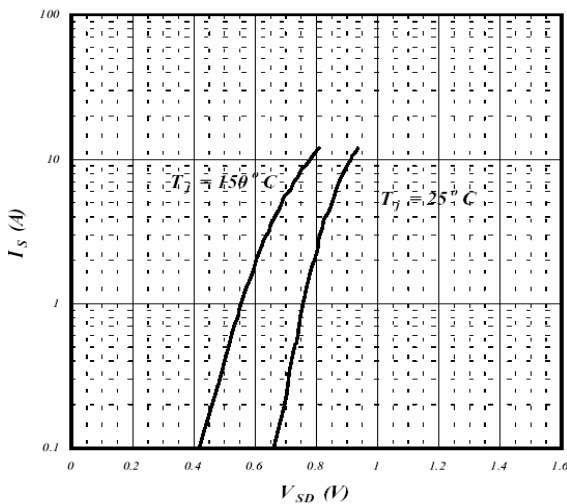


Fig 11. Forward Characteristics of Reverse Diode

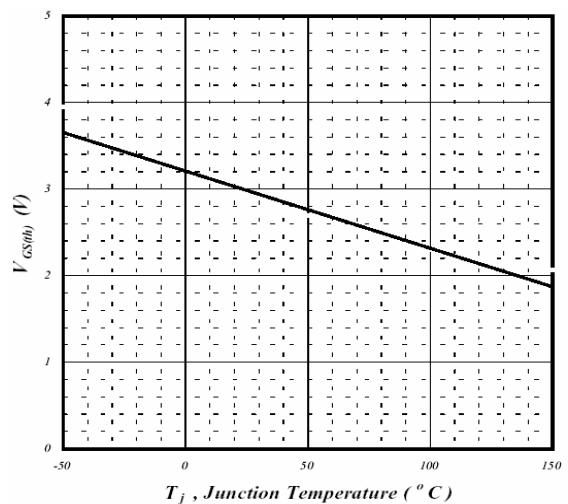
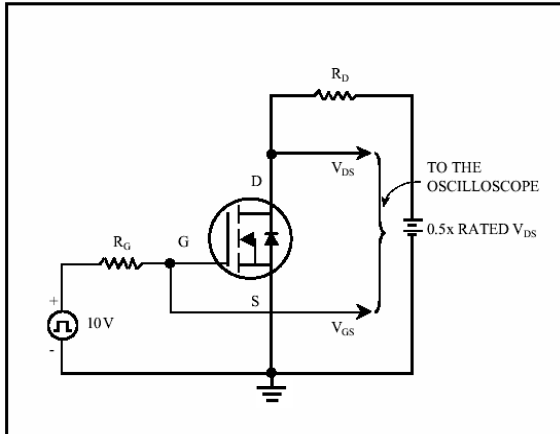
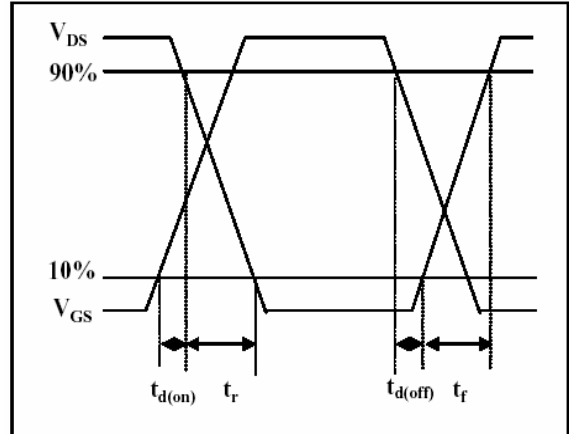


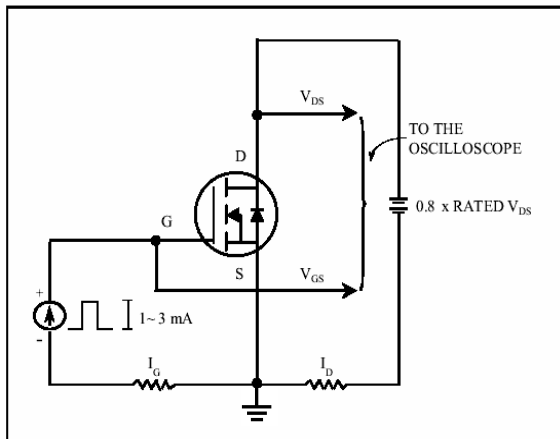
Fig 12. Gate Threshold Voltage v.s. Junction Temperature



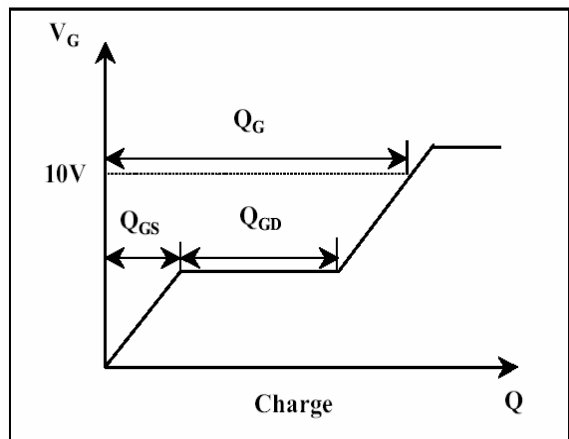
**Fig 13. Switching Time Circuit**



**Fig 14. Switching Time Waveform**



**Fig 15. Gate Charge Circuit**



**Fig 16. Gate Charge Waveform**

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