

GI09N20

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	200V
RDS(ON)	380mΩ
ID	8.6A

Description

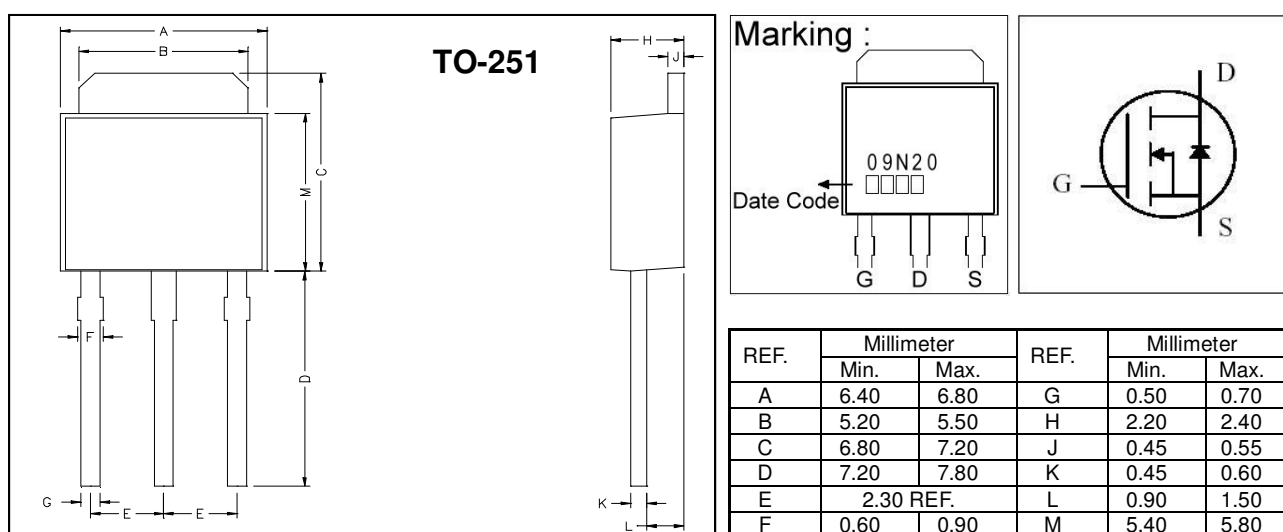
The GI09N20 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The through-hole version (TO-251) is available for low-profile applications.

Features

- *Simple Drive Requirement
- *Lower On-resistance
- *Fast Switching Characteristic

Package Dimensions



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^\circ C$	8.6	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^\circ C$	5.5	A
Pulsed Drain Current ¹	I_{DM}	36	A
Total Power Dissipation	$P_D @T_C=25^\circ C$	69	W
Linear Derating Factor		0.55	W/ $^\circ C$
Single Pulse Avalanche Energy ²	E_{AS}	40	mJ
Avalanche Current	I_{AR}	8.6	A
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	$^\circ C$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case Max.	Rthj-c	1.8	$^\circ C/W$
Thermal Resistance Junction-ambient Max.	Rthj-a	110	$^\circ C/W$

Electrical Characteristics (Tj = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	200	-	-	V	$V_{GS}=0, I_D=1mA$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.24	-	V/°C	Reference to 25°C, $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	3.7	-	S	$V_{DS}=10V, I_D=5A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 30V$
Drain-Source Leakage Current(Tj=25°C)	I_{DSS}	-	-	10	uA	$V_{DS}=200V, V_{GS}=0$
Drain-Source Leakage Current(Tj=150°C)		-	-	100	uA	$V_{DS}=160V, V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	380	mΩ	$V_{GS}=10V, I_D=5A$
Total Gate Charge ³	Q_g	-	23	37	nC	$I_D=8.6A$ $V_{DS}=160V$ $V_{GS}=10V$
Gate-Source Charge	Q_{gs}	-	4	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	13	-		
Turn-on Delay Time ³	$T_{d(on)}$	-	12	-	ns	$V_{DD}=100V$ $I_D=8.6A$ $V_{GS}=10V$ $R_G=10\Omega$ $R_D=11.6\Omega$
Rise Time	T_r	-	25	-		
Turn-off Delay Time	$T_{d(off)}$	-	36	-		
Fall Time	T_f	-	16	-		
Input Capacitance	C_{iss}	-	500	800	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	90	-		
Reverse Transfer Capacitance	C_{rss}	-	40	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ³	V_{SD}	-	-	1.3	V	$I_S=8.6A, V_{GS}=0V$
Reverse Recovery Time	T_{rr}	-	225	-	ns	$I_S=8.6A, V_{GS}=0V$
Reverse Recovery Charge	Q_{rr}	-	2260	-	nC	$di/dt=100A/\mu s$

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

2. Staring $T_j=25^\circ C, V_{DD}=50V, L=1mH, R_G=25\Omega, I_{AS}=8.6A.$

3. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Characteristics Curve

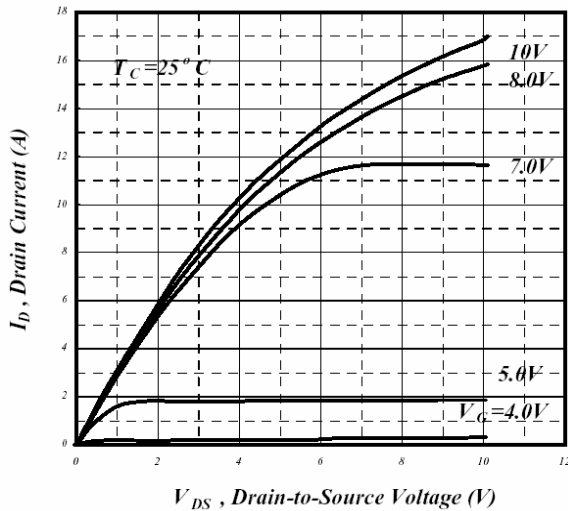


Fig 1. Typical Output Characteristics

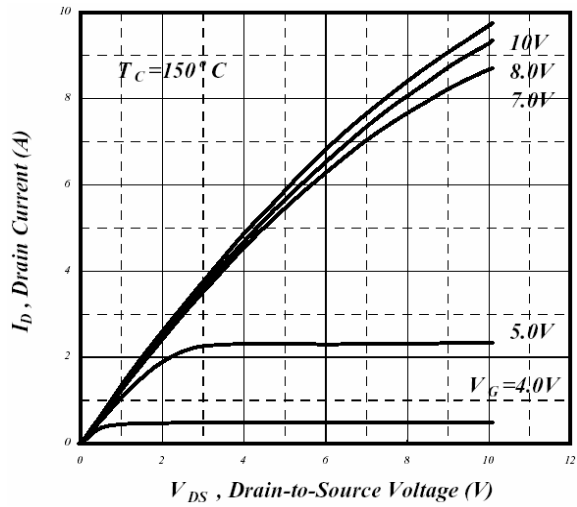


Fig 2. Typical Output Characteristics

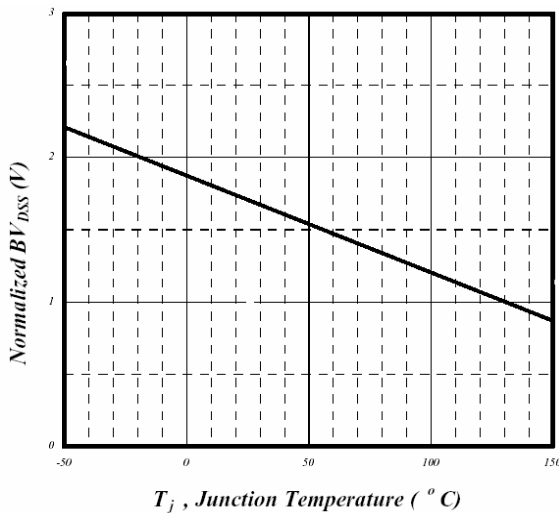


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

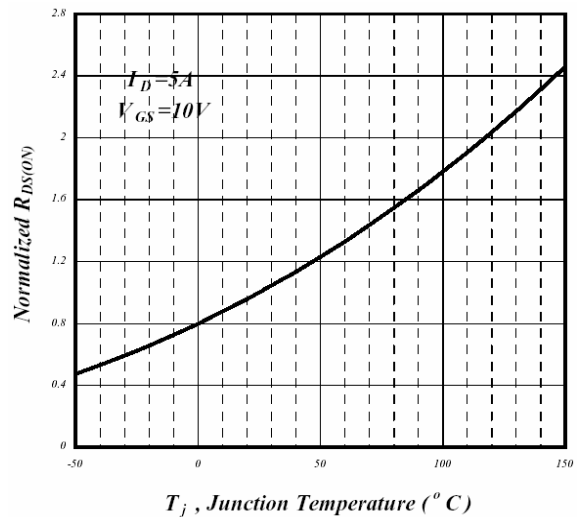


Fig 4. Normalized On-Resistance v.s. Junction Temperature

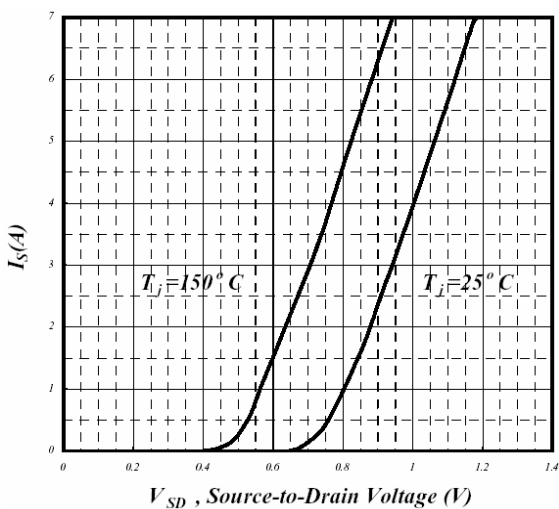


Fig 5. Forward Characteristics of Reverse Diode

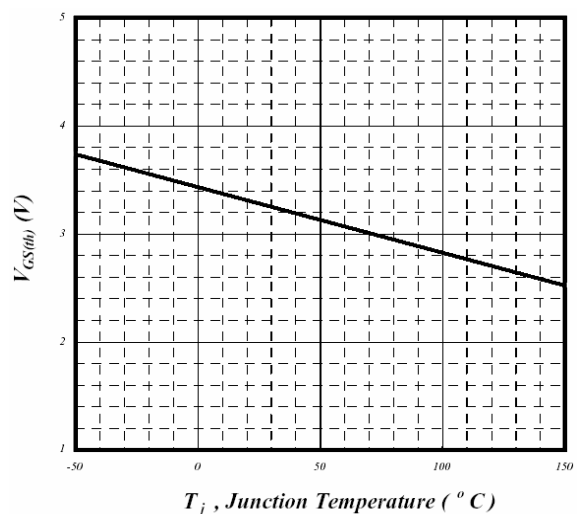


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

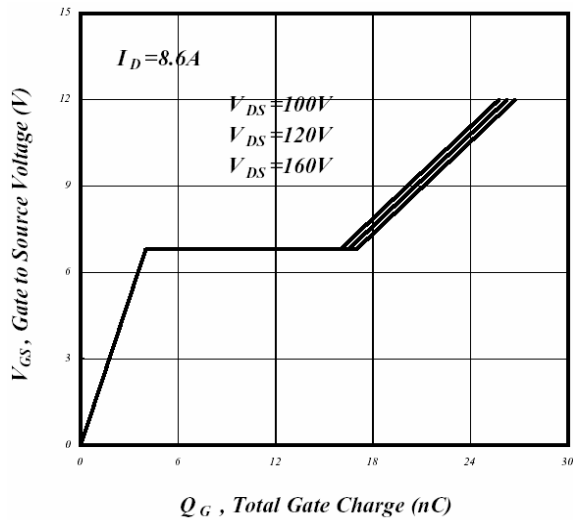


Fig 7. Gate Charge Characteristics

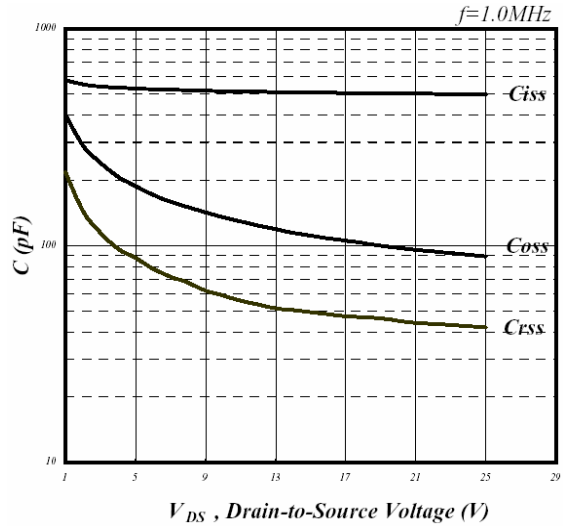


Fig 8. Typical Capacitance Characteristics

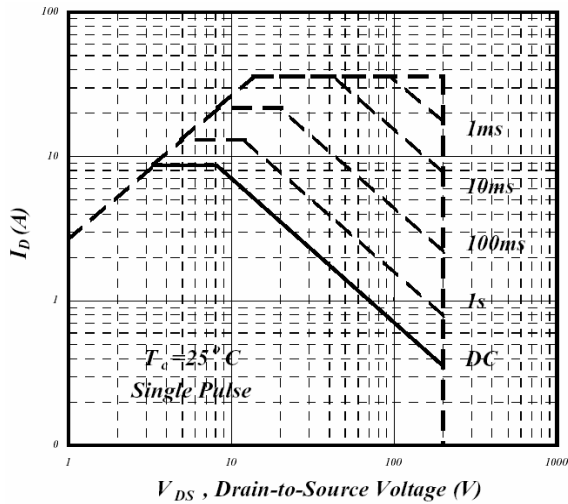


Fig 9. Maximum Safe Operating Area

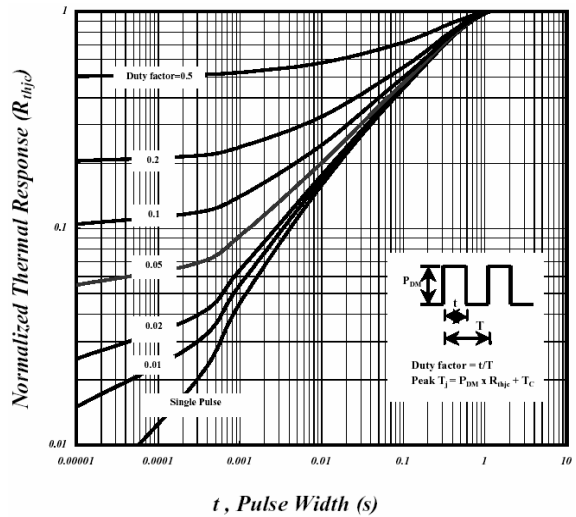


Fig 10. Effective Transient Thermal Impedance

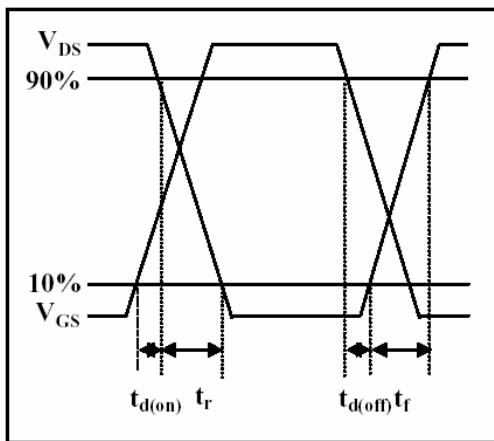


Fig 11. Switching Time Waveform

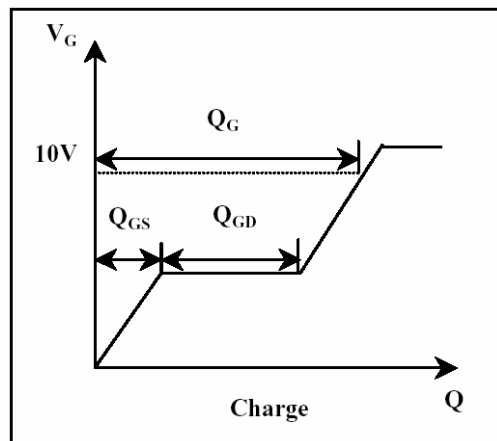


Fig 12. Gate Charge Waveform

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Head Office And Factory:

- Taiwan: No. 17-1 Tatung Rd. Fu Kou Hsin-Chu Industrial Park, Hsin-Chu, Taiwan, R. O. C.
- TEL : 886-3-597-7061 FAX : 886-3-597-9220, 597-0785
- China: (201203) No.255, Jang-Jiang Tsai-Lueng RD. , Pu-Dung-Hsin District, Shang-Hai City, China
- TEL : 86-21-5895-7671 ~ 4 FAX : 86-21-38950165