

GI9T18

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV _{DSS}	20V
R _{DS(ON)}	14mΩ
I _D	38A

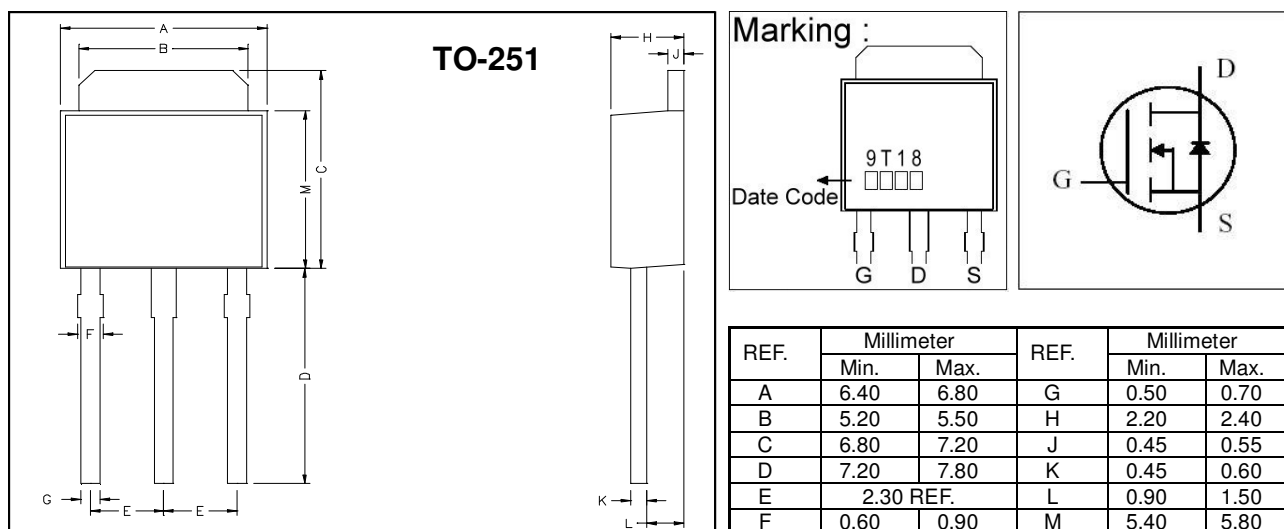
Description

The GI9T18 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

Features

- *Capable of 2.5V gate drive
- *Low Gate Charge

Package Dimensions



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current, V _{GS} @4.5V	I _D @T _C =25°C	38	A
Continuous Drain Current, V _{GS} @4.5V	I _D @T _C =100°C	24	A
Pulsed Drain Current ¹	I _{DM}	140	A
Total Power Dissipation	P _D @T _C =25°C	31.3	W
Linear Derating Factor		0.25	W/°C
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}	4	°C/W
Thermal Resistance Junction-ambient Max.	R _{thj-a}	110	°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}	20	-	-	V	$V_{GS}=0, I_D=250\mu A$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.1	-	V/°C	Reference to 25°C, $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	33	-	S	$V_{DS}=5V, I_D=18A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current(T _j =25°C)	I_{DSS}	-	-	1	uA	$V_{DS}=20V, V_{GS}=0$
Drain-Source Leakage Current(T _j =150°C)		-	-	25	uA	$V_{DS}=12V, V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	14	mΩ	$V_{GS}=4.5V, I_D=18A$
		-	-	28		$V_{GS}=2.5V, I_D=9A$
Total Gate Charge ²	Q_g	-	16	25	nC	$I_D=18A$ $V_{DS}=16V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	3	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	9	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	12	-	ns	$V_{DS}=10V$ $I_D=18A$ $V_{GS}=5V$ $R_G=3.3\Omega$ $R_D=0.56\Omega$
Rise Time	T_r	-	80	-		
Turn-off Delay Time	$T_{d(off)}$	-	22	-		
Fall Time	T_f	-	12	-		
Input Capacitance	C_{iss}	-	1115	1790	pF	$V_{GS}=0V$ $V_{DS}=20V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	280	-		
Reverse Transfer Capacitance	C_{rss}	-	220	-		
Gate Resistance	R_g	-	1.54	-	Ω	$f=1.0MHz$

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	1.3	V	$I_S=18A, V_{GS}=0V$
Reverse Recovery Time ²	T_{rr}	-	19	-	ns	$I_S=18A, V_{GS}=0V$ $di/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	11	-	nC	

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

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

Characteristics Curve

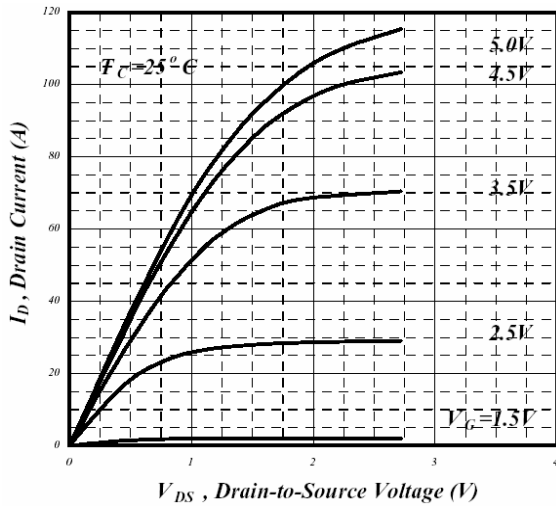


Fig 1. Typical Output Characteristics

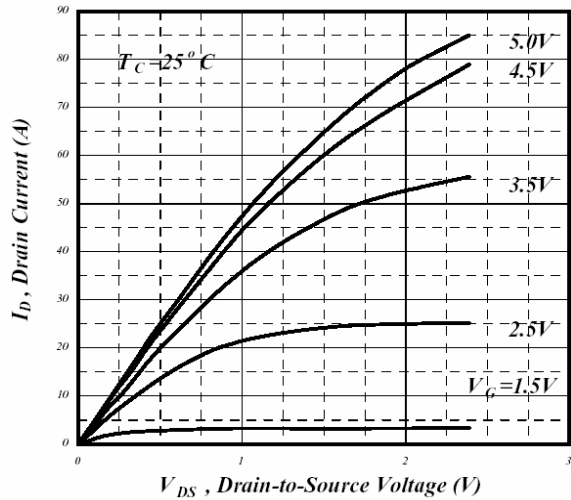


Fig 2. Typical Output Characteristics

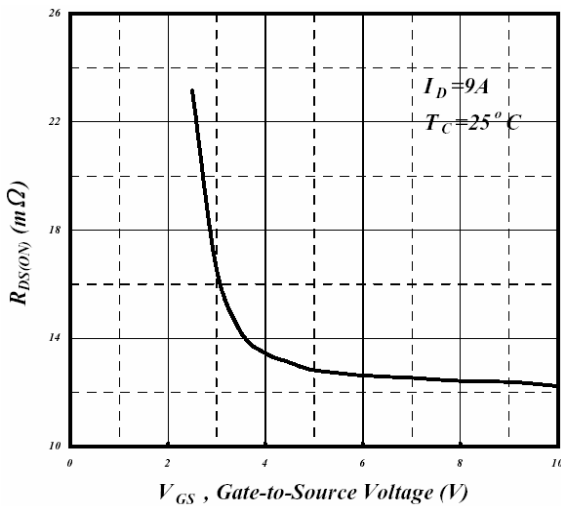


Fig 3. On-Resistance v.s. Gate Voltage

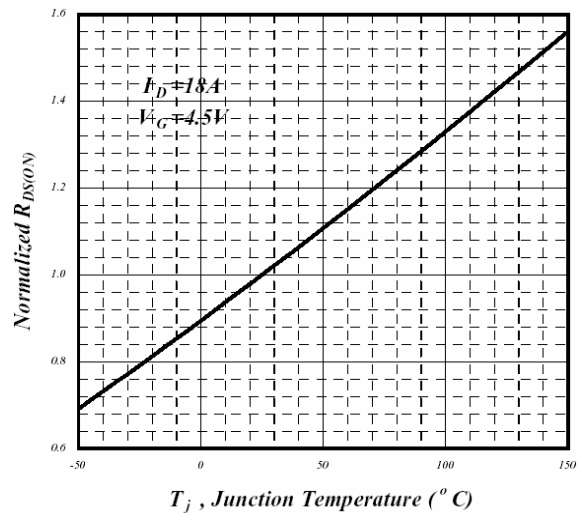


Fig 4. Normalized On-Resistance v.s. Junction Temperature

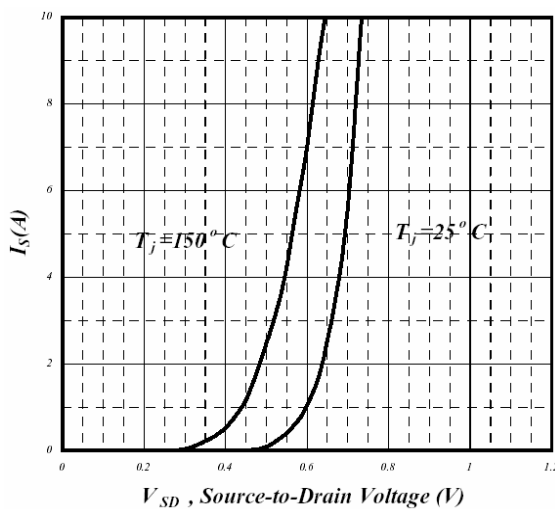


Fig 5. Forward Characteristics of Reverse Diode

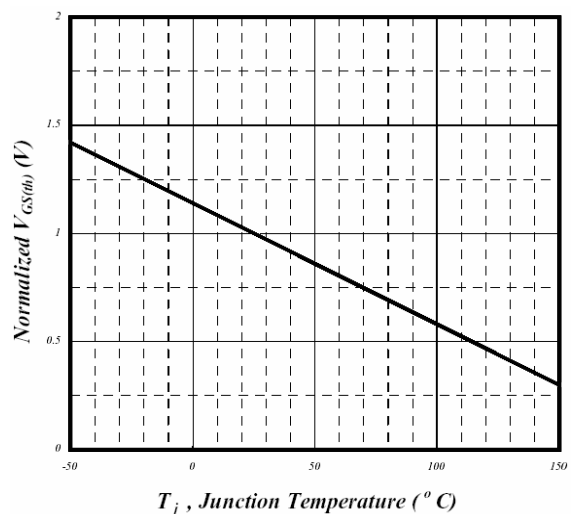


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

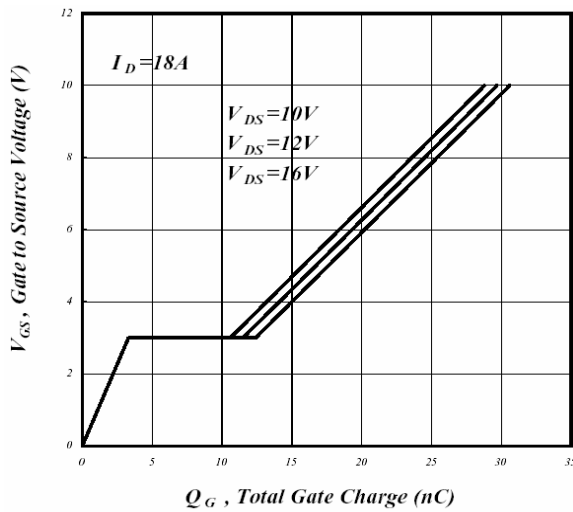


Fig 7. Gate Charge Characteristics

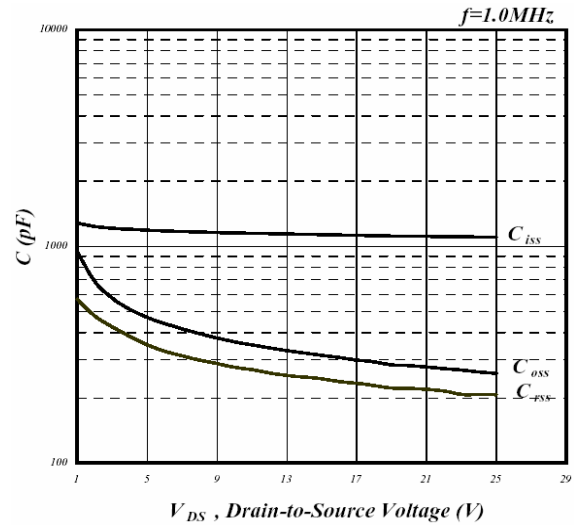


Fig 8. Typical Capacitance Characteristics

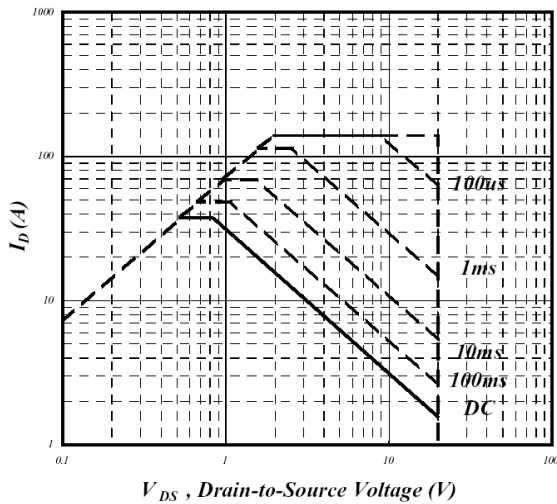


Fig 9. Maximum Safe Operating Area

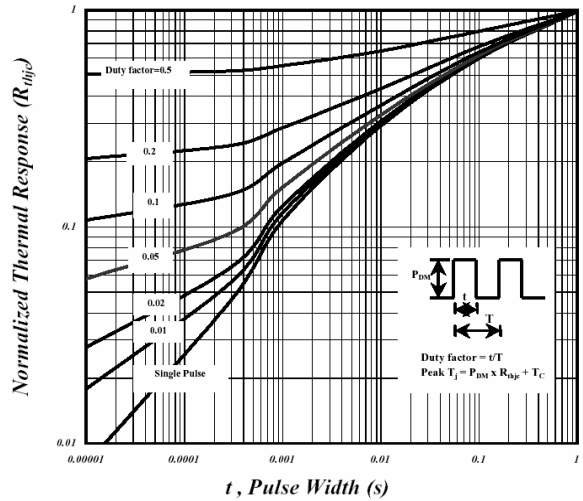


Fig 10. Effective Transient Thermal Impedance

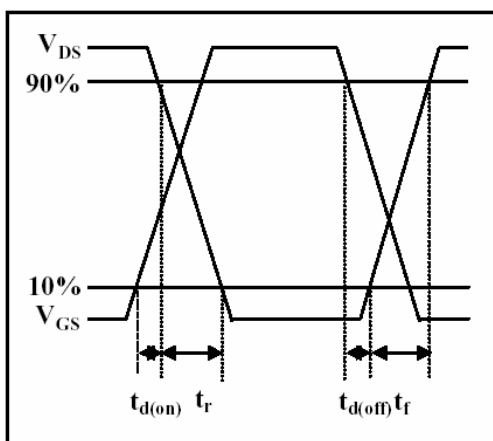


Fig 11. Switching Time Waveform

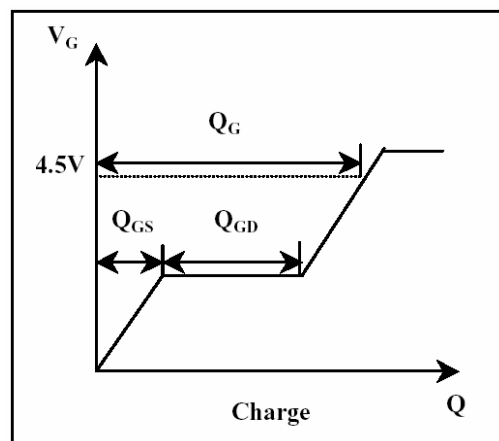


Fig 12. Gate Charge Waveform

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