

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

TO-251

Marking :

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	7.20	7.80	K	0.45	0.60
E	2.30 REF.		L	0.90	1.50
F	0.60	0.90	M	5.40	5.80

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 =250uA
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 =250uA
Forward Transconductance	g _{fs}	-	33	-	S	V _{DS} =5V, I _D =18A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±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") Charge	Q _{gd}	-	9	-		
Turn-on Delay Time ²	T _{d(on)}	-	12	-	ns	V _{DS} =10V I _D =18A V _{GS} =5V R _G =3.3Ω R _D =0.56Ω
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/μs
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

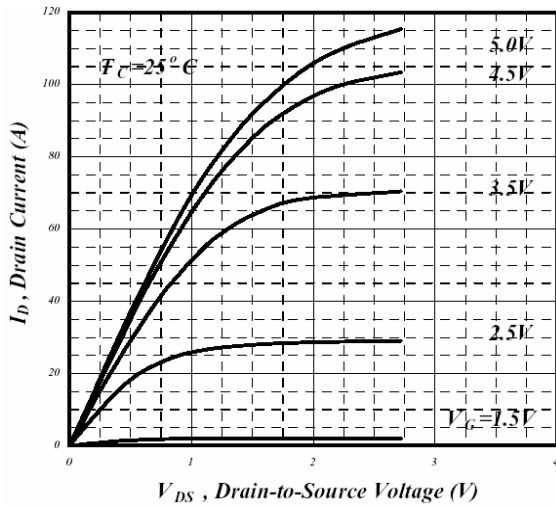


Fig 1. Typical Output Characteristics

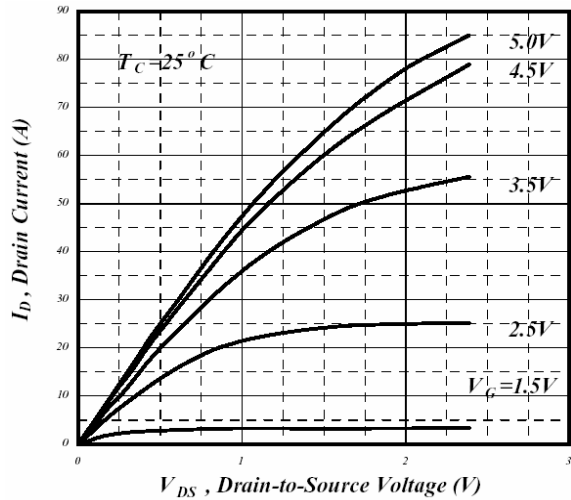


Fig 2. Typical Output Characteristics

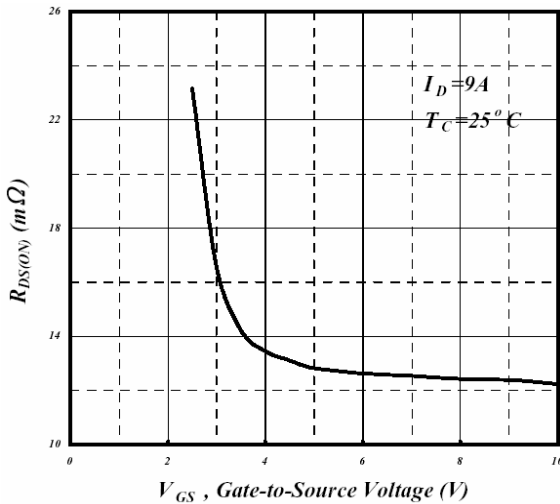


Fig 3. On-Resistance v.s. Gate Voltage

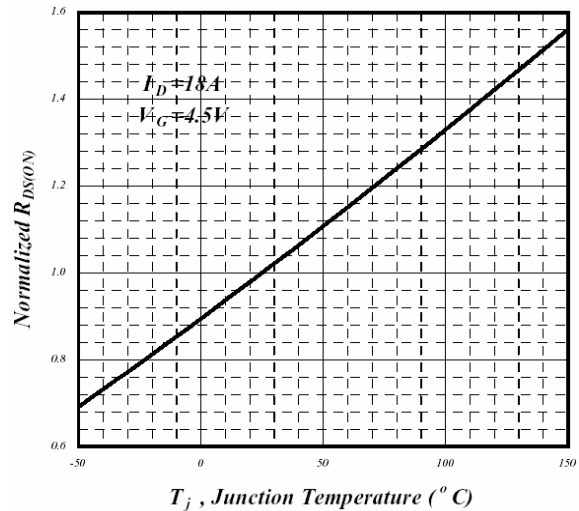


Fig 4. Normalized On-Resistance v.s. Junction Temperature

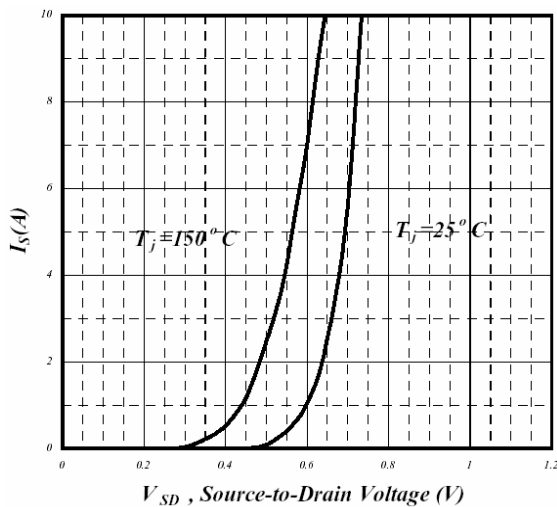


Fig 5. Forward Characteristics of Reverse Diode

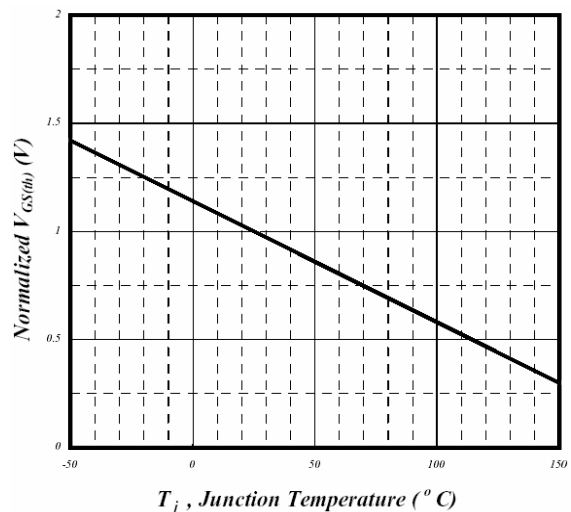


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

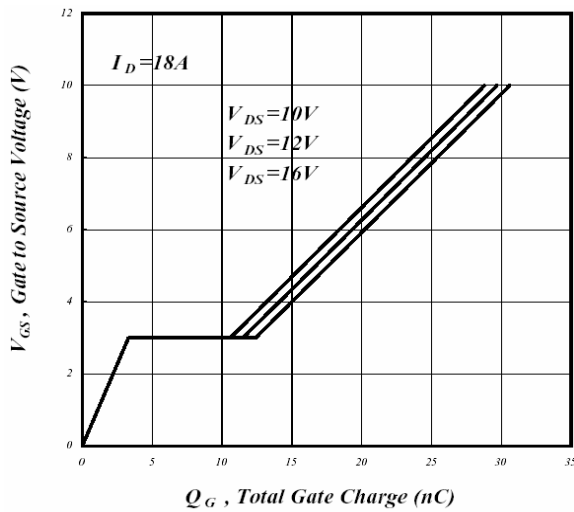


Fig 7. Gate Charge Characteristics

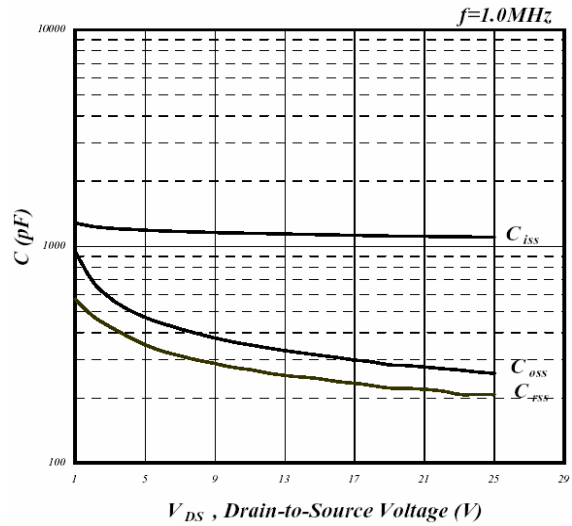


Fig 8. Typical Capacitance Characteristics

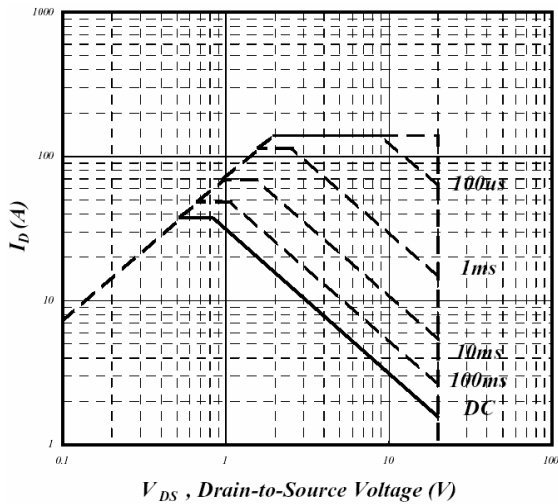


Fig 9. Maximum Safe Operating Area

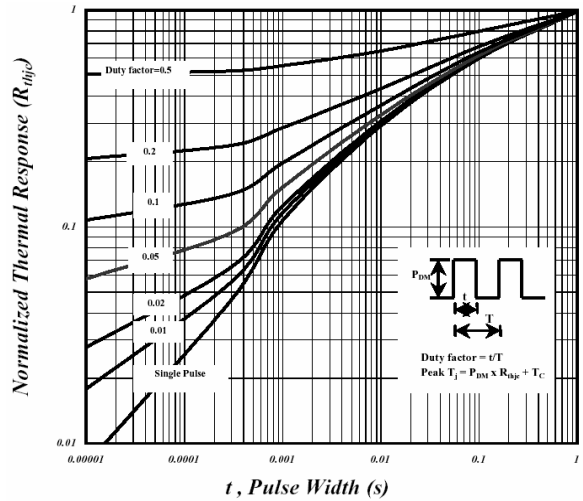


Fig 10. Effective Transient Thermal Impedance



Fig 11. Switching Time Waveform

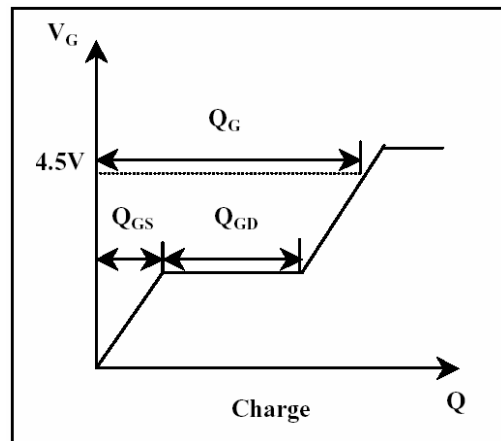


Fig 12. Gate Charge Waveform

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