

GI9960

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	40V
RDS(ON)	16mΩ
ID	42A

Description

The GI9960 provides the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

Features

- *Simple Drive Requirement
- *Low Gate Charge
- *Fast Switching

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}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^{\circ}C$	42	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^{\circ}C$	26	A
Pulsed Drain Current ¹	I_{DM}	195	A
Total Power Dissipation	$P_D @T_C=25^{\circ}C$	45	W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C
Linear Derating Factor		0.36	W/°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case	Rthj-c	2.8	°C/W
Thermal Resistance Junction-ambient	Rthj-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}	40	-	-	V	V _{GS} =0, I _D =250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.032	-	V/°C	Reference to 25°C, I _D =1mA
Gate Threshold Voltage	V _{GS(th)}	1.0	-	3.0	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transconductance	g _{fs}	-	30	-	S	V _{DS} =10V, I _D =20A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	1	uA	V _{DS} =40V, V _{GS} =0
Drain-Source Leakage Current(T _j =150°C)		-	-	25	uA	V _{DS} =32V, V _{GS} =0
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	16	mΩ	I _D =20A, V _{GS} =10V
		-	-	25		I _D =18A, V _{GS} =4.5V
Total Gate Charge ²	Q _g	-	18	-	nC	I _D =20A V _{DS} =20V V _{GS} =4.5V
Gate-Source Charge	Q _{gs}	-	6	-		
Gate-Drain ("Miller") Change	Q _{gd}	-	12	-		
Turn-on Delay Time ²	T _{d(on)}	-	9	-	ns	V _{DS} =20V I _D =20A V _{GS} =10V R _G =3.3Ω R _D =1Ω
Rise Time	T _r	-	110	-		
Turn-off Delay Time	T _{d(off)}	-	23	-		
Fall Time	T _f	-	10	-		
Input Capacitance	C _{iss}	-	1500	-	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	250	-		
Reverse Transfer Capacitance	C _{rss}	-	180	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V _{SD}	-	-	1.3	V	I _S =45A, V _{GS} =0V
Reverse Recovery Time	T _{rr}	-	22	-	ns	I _S =20A, V _{GS} =0V di/dt=100A/μs
Reverse Recovery Charge	Q _{rr}	-	27.4	-	nC	

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

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

Characteristics Curve

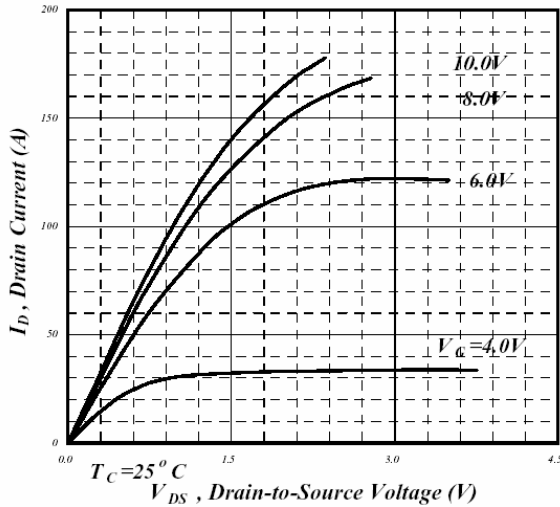


Fig 1. Typical Output Characteristics

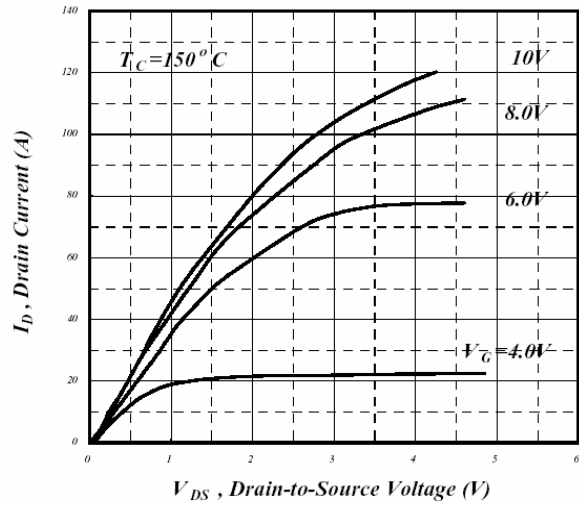


Fig 2. Typical Output Characteristics

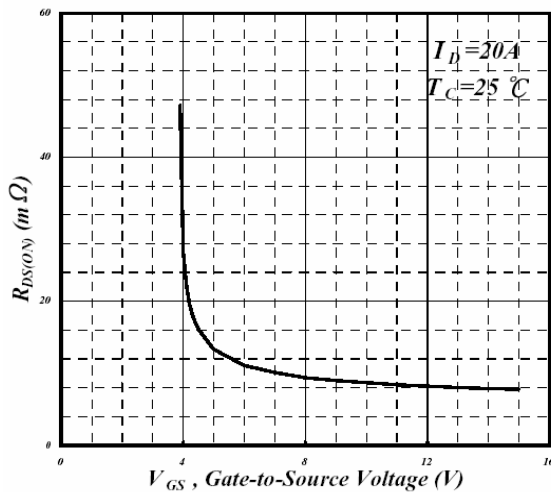


Fig 3. On-Resistance v.s. Gate Voltage

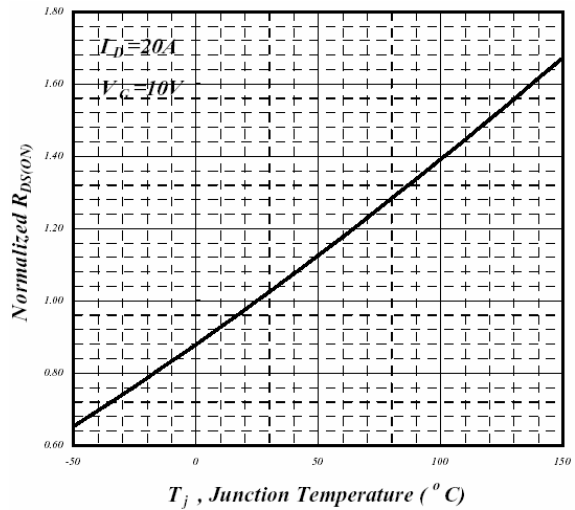


Fig 4. Normalized On-Resistance v.s. Junction Temperature

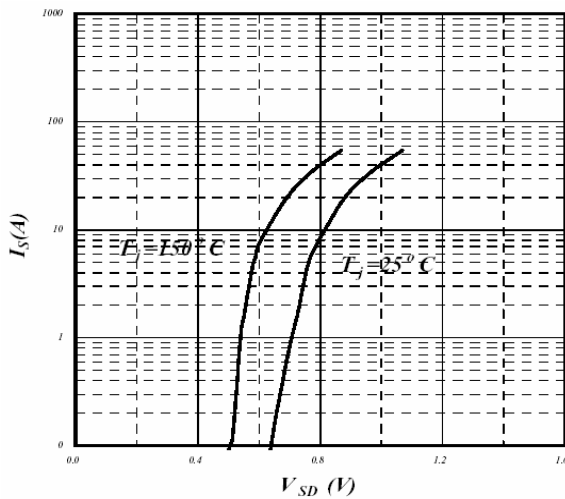


Fig 5. Forward Characteristic of Reverse Diode

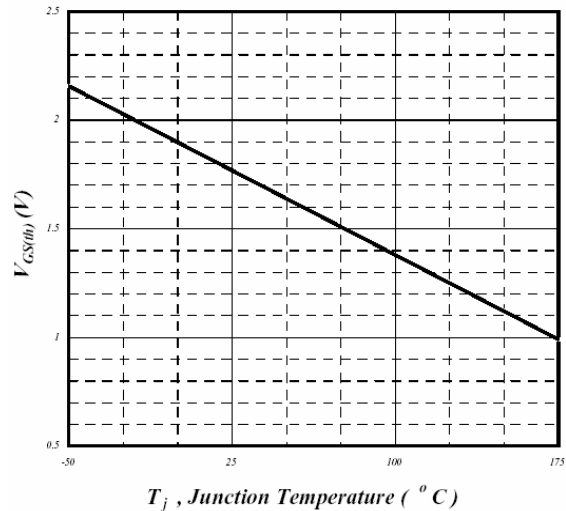


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

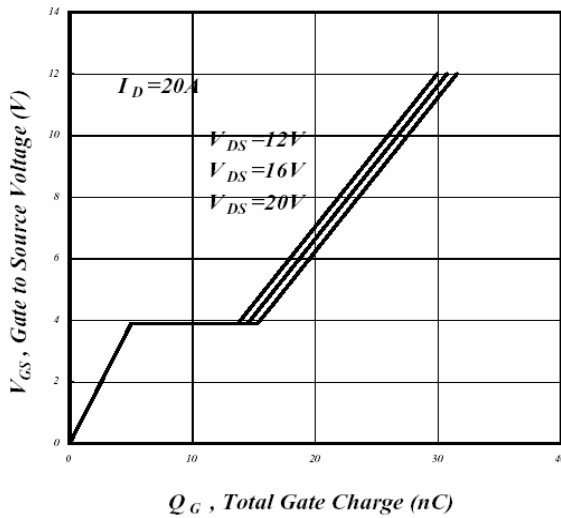


Fig 7. Gate Charge Characteristics

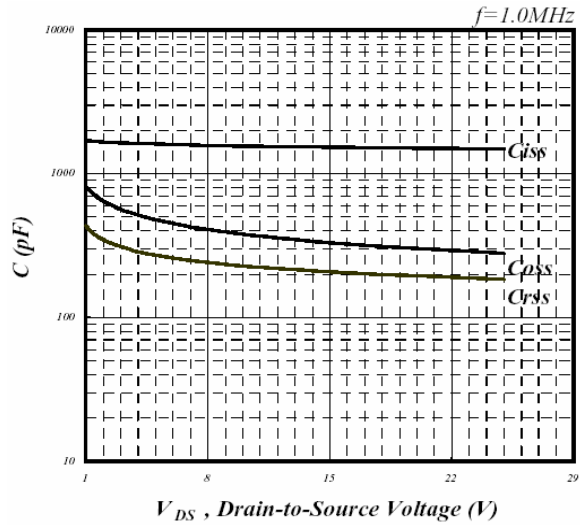


Fig 8. Typical Capacitance Characteristics

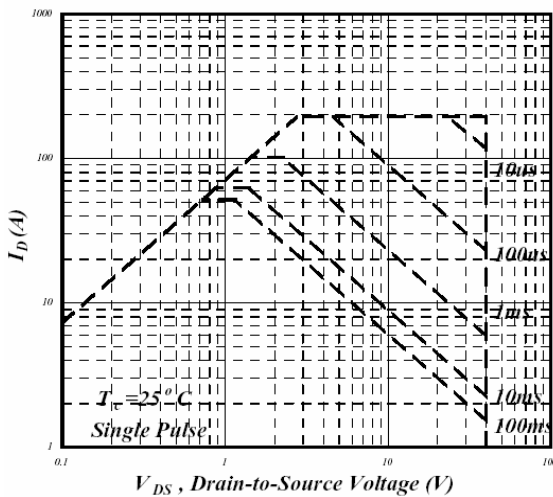


Fig 9. Maximum Safe Operating Area

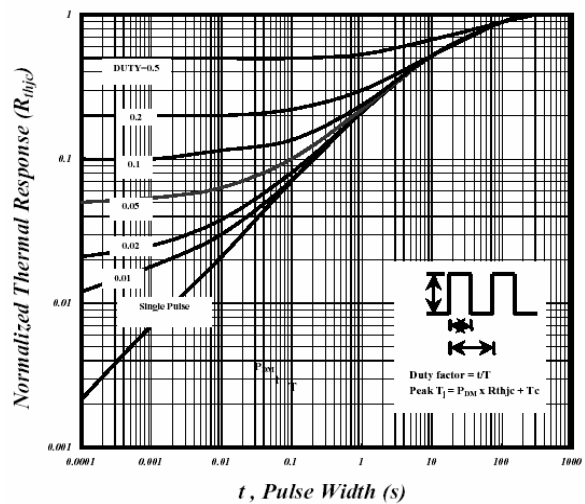


Fig 10. Effective Transient Thermal Impedance

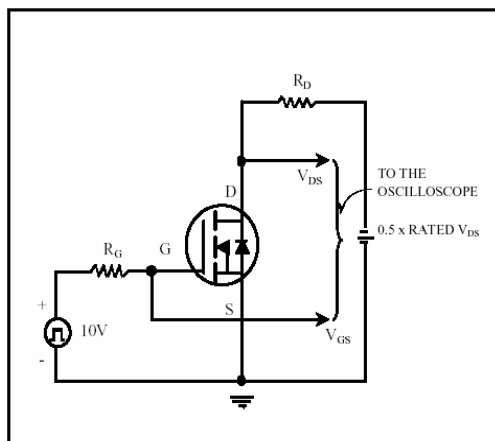


Fig 11. Switching Time Circuit

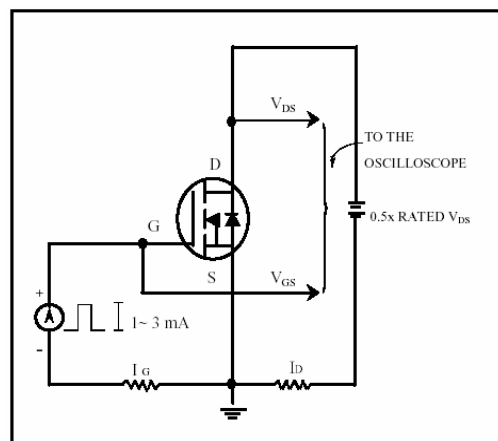


Fig 12. Gate Charge Circuit

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