

GTM CORPORATION

ISSUED DATE :2005/08/08
REVISED DATE :

GP9960

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	40V
RDS(ON)	25mΩ
Id	7A

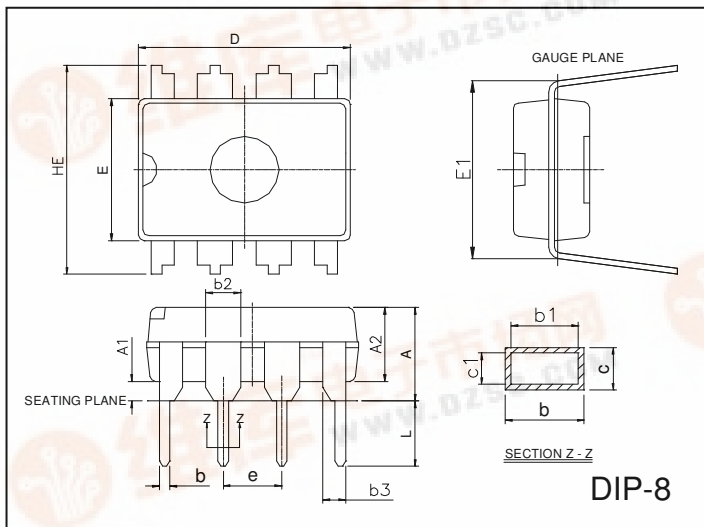
Description

The GP9960 provides the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.

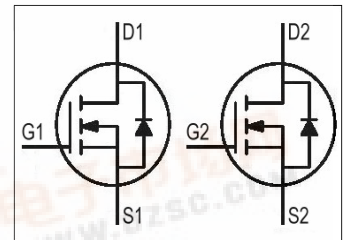
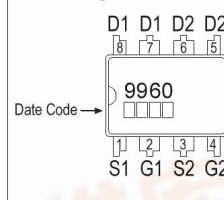
Features

- *Low On-Resistance
- *Fast Switching Speed

Package Dimensions



Marking :



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	-	0.5334	c1	0.203	0.279
A1	0.381	-	D	9.017	10.16
A2	2.921	4.953	E	6.096	7.112
b	0.356	0.559	E1	7.620	8.255
b1	0.356	0.508	e	2.540 BSC	
b2	1.143	1.778	HE	-	10.92
b3	0.762	1.143	L	2.921	3.810
c	0.203	0.356			

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ³	$I_D @ TA=25^\circ C$	7	A
Continuous Drain Current ³	$I_D @ TA=70^\circ C$	5.6	A
Pulsed Drain Current ¹	I_{DM}	20	A
Total Power Dissipation	$P_D @ TA=25^\circ C$	2	W
Linear Derating Factor		0.016	W/ $^\circ C$
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	$^\circ C$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	Rthj-a	62.5	$^\circ C/W$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	40	-	-	V	$V_{GS}=0, I_D=250\mu A$
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	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	25	-	S	$V_{DS}=10V, I_D=7A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}= \pm 20V$
Drain-Source Leakage Current(Tj=25°C)	I_{DSS}	-	-	1	μA	$V_{DS}=40V, V_{GS}=0$
Drain-Source Leakage Current(Tj=70°C)		-	-	25	μA	$V_{DS}=32V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	25	m Ω	$V_{GS}=10V, I_D=7A$
		-	-	40		$V_{GS}=4.5V, I_D=5A$
Total Gate Charge ²	Q_g	-	14.7	-	nC	$I_D=7A$ $V_{DS}=20V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	7.1	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	6.8	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	11.5	-	ns	$V_{DS}=20V$ $I_D=1A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=20\Omega$
Rise Time	T_r	-	6.3	-		
Turn-off Delay Time	$T_{d(off)}$	-	28.2	-		
Fall Time	T_f	-	12.6	-		
Input Capacitance	C_{iss}	-	1725	-	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	235	-		
Reverse Transfer Capacitance	C_{rss}	-	145	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	1.3	V	$I_S=2.3A, V_{GS}=0V$
Continuous Source Current (Body Diode)	I_S	-	-	1.54	A	$V_D=V_G=0V, V_S=1.3V$

Notes: 1. Pulse width limited by Max. junction temperature.

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

3. Mounted on 1 in² copper pad of FR4 board; 90°C/W when mounted on Min. copper pad.

Characteristics Curve

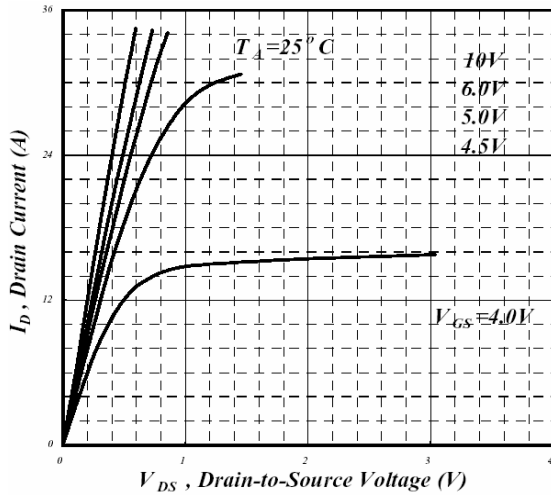


Fig 1. Typical Output Characteristics

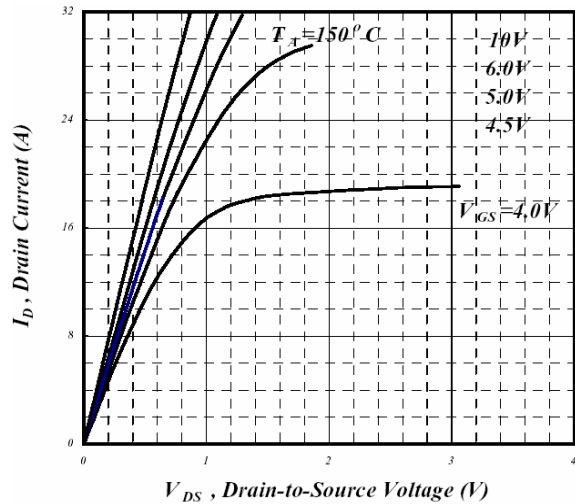


Fig 2. Typical Output Characteristics

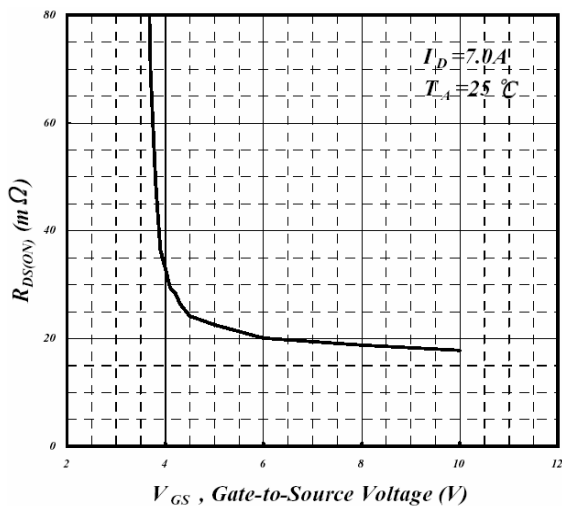


Fig 3. On-Resistance v.s. Gate Voltage

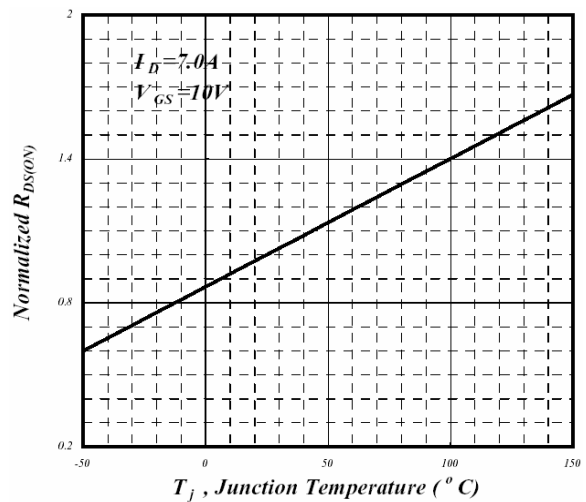


Fig 4. Normalized On-Resistance v.s. Junction Temperature

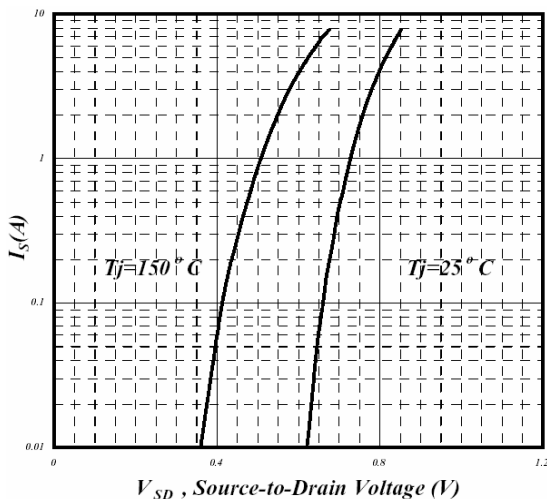


Fig 5. Forward Characteristics of Reverse Diode

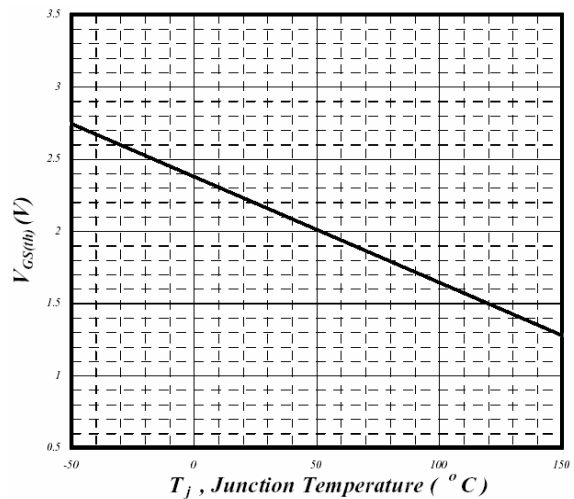


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

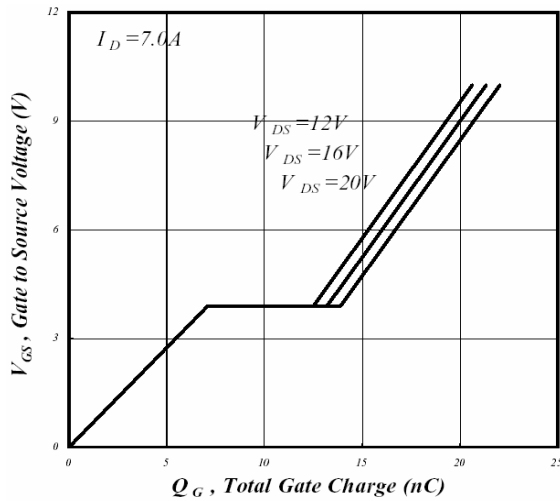


Fig 7. Gate Charge Characteristics

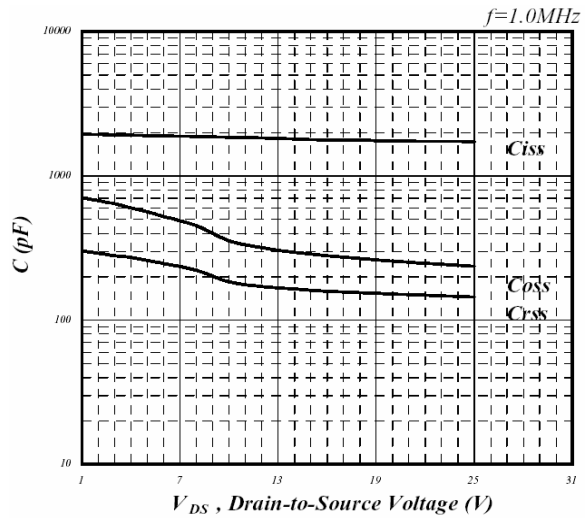


Fig 8. Typical Capacitance Characteristics

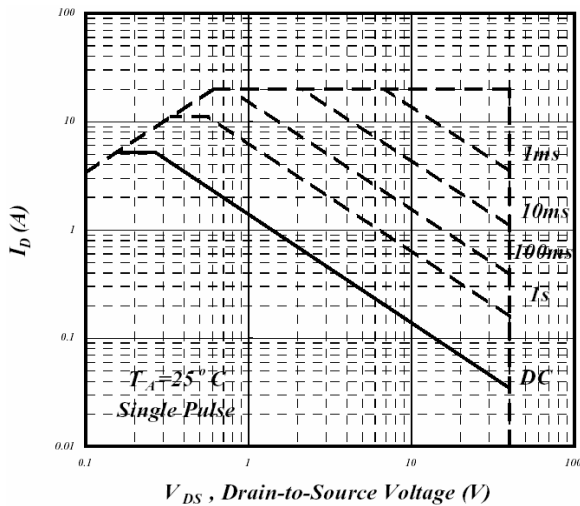


Fig 9. Maximum Safe Operating Area

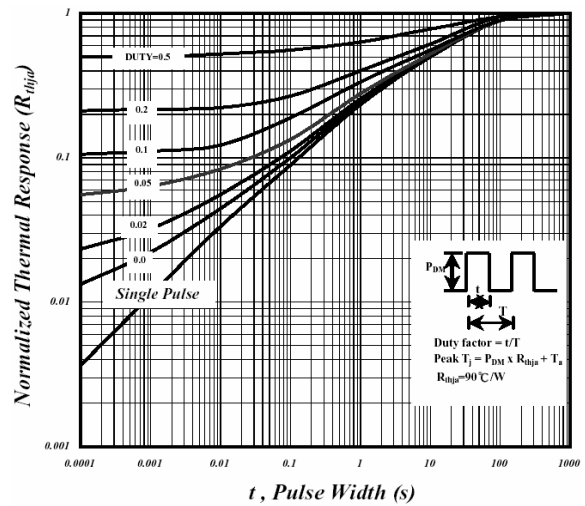


Fig 10. Effective Transient Thermal Impedance

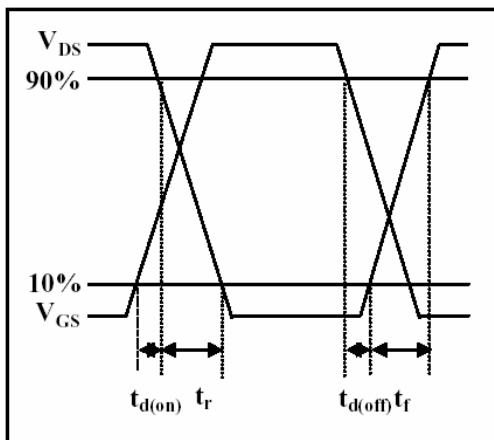


Fig 11. Switching Time Waveform

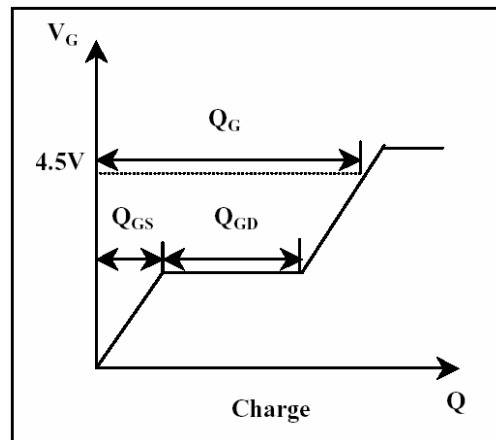


Fig 12. Gate Charge Waveform

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