

GSC9478

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	60V
RDS(ON)	64mΩ
ID	4.8A

Description

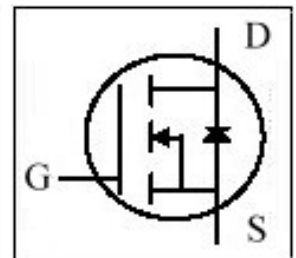
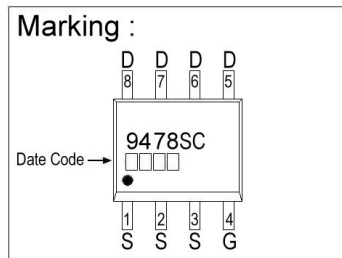
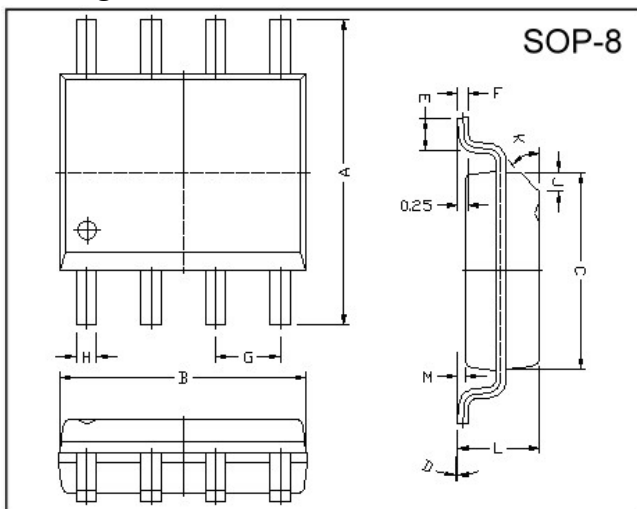
The GSC9478 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Features

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

Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current ³	$I_D @TA=25^\circ C$	4.8	A
Continuous Drain Current ³	$I_D @TA=70^\circ C$	3.8	A
Pulsed Drain Current ¹	I_{DM}	30	A
Total Power Dissipation	$P_D @TA=25^\circ C$	2.5	W
Linear Derating Factor		0.02	W/°C
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	$R_{thj-amb}$	50	°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}	60	-	-	V	$V_{GS}=0, I_D=250\mu A$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.06	-	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}	-	6	-	S	$V_{DS}=10V, I_D=4A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 25V$
Drain-Source Leakage Current(T _j =25°C)	I_{DSS}	-	-	1	uA	$V_{DS}=60V, V_{GS}=0$
Drain-Source Leakage Current(T _j =70°C)		-	-	25	uA	$V_{DS}=48V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	64	mΩ	$V_{GS}=10V, I_D=4A$
		-	-	72		$V_{GS}=4.5V, I_D=3A$
Total Gate Charge ²	Q_g	-	9	15	nC	$I_D=4A$ $V_{DS}=48V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	2	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	5	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	8	-	ns	$V_{DS}=30V$ $I_D=1A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=30\Omega$
Rise Time	T_r	-	6	-		
Turn-off Delay Time	$T_{d(off)}$	-	20	-		
Fall Time	T_f	-	4	-		
Input Capacitance	C_{iss}	-	710	1140	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	80	-		
Reverse Transfer Capacitance	C_{rss}	-	51	-		
Gate Resistance	R_g	-	2.1	-	Ω	$f=1.0MHz$

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	1.2	V	$I_S=2A, V_{GS}=0V$
Reverse Recovery Time ²	T_{rr}	-	28	-	ns	$I_S=4A, V_{GS}=0V$ $di/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	36	-	nC	

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

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

3. Surface mounted on 1 in² copper pad of FR4 board; 125°C/W when mounted on Min. copper pad.

Characteristics Curve

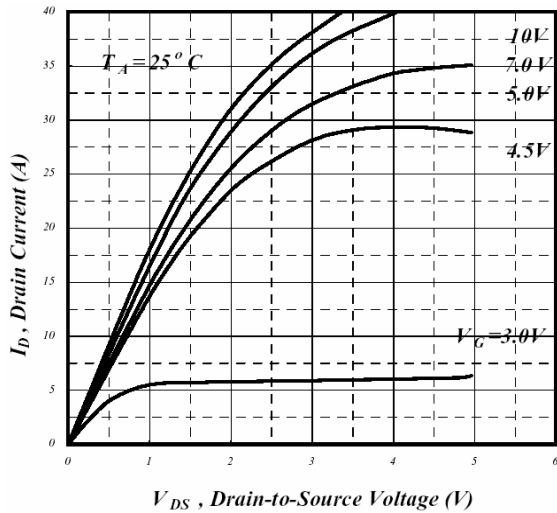


Fig 1. Typical Output Characteristics

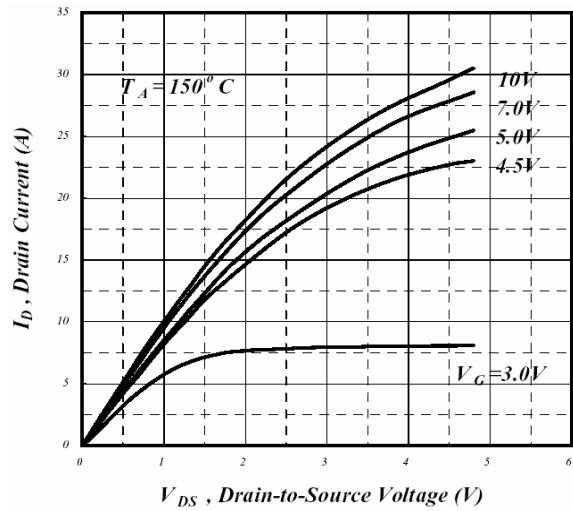


Fig 2. Typical Output Characteristics

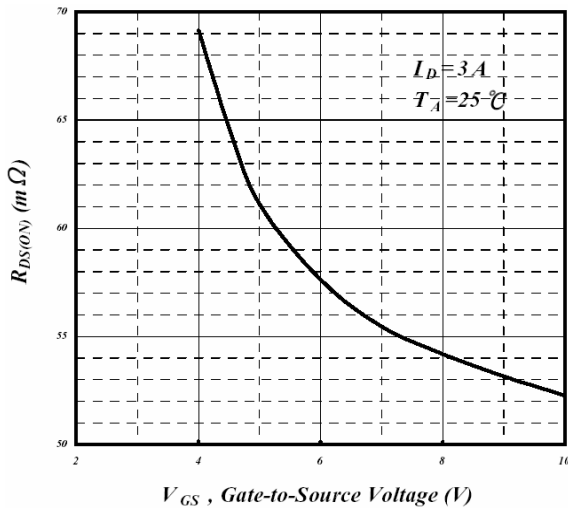


Fig 3. On-Resistance v.s. Gate Voltage

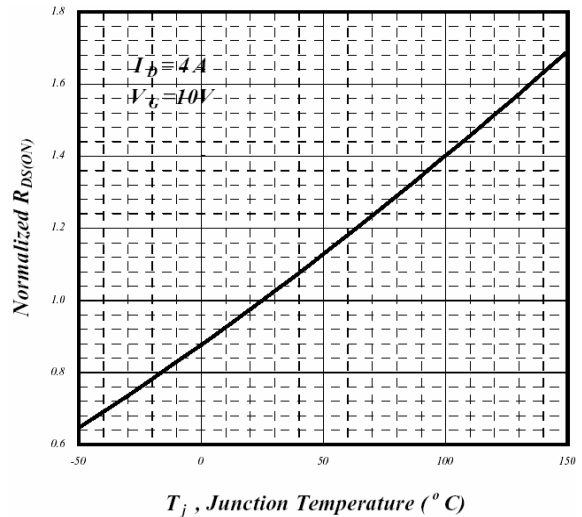


Fig 4. Normalized On-Resistance v.s. Junction Temperature

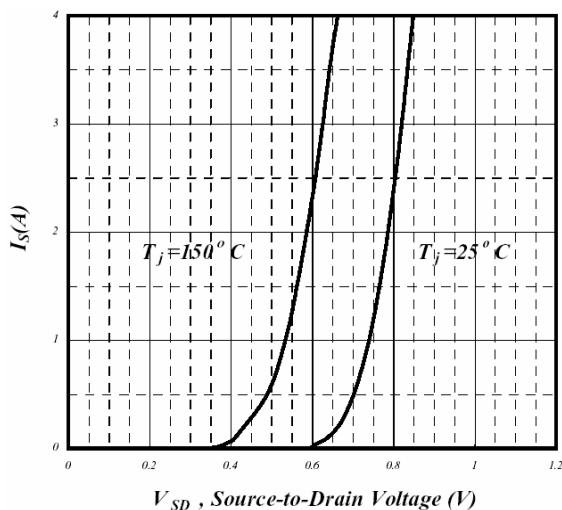


Fig 5. Forward Characteristics of Reverse Diode

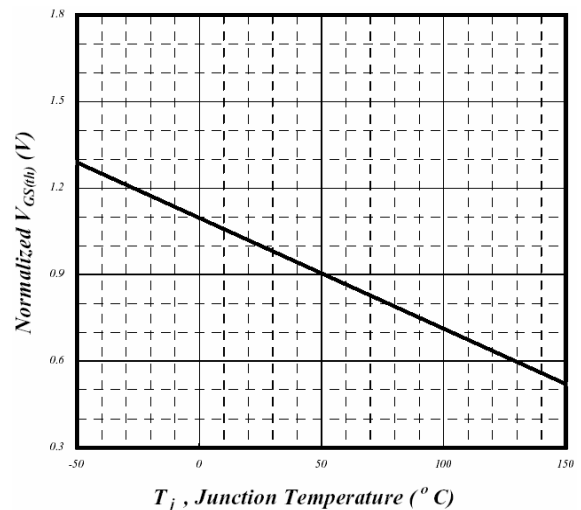
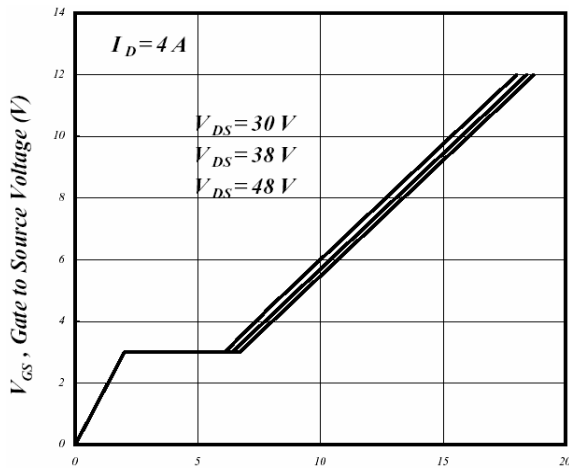
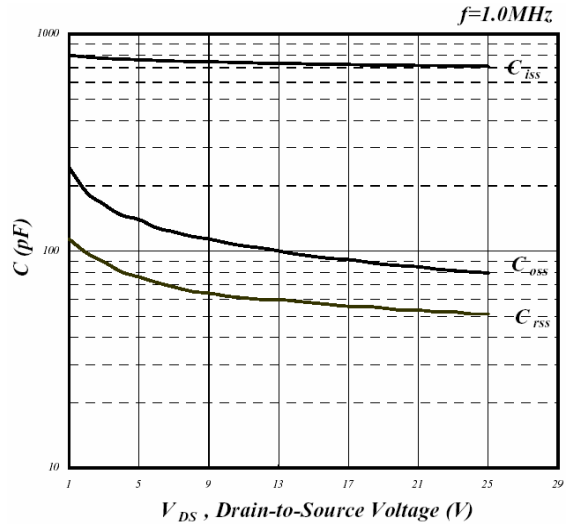


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



Q_G , Total Gate Charge (nC)
Fig 7. Gate Charge Characteristics



$f=1.0\text{MHz}$
Fig 8. Typical Capacitance Characteristics

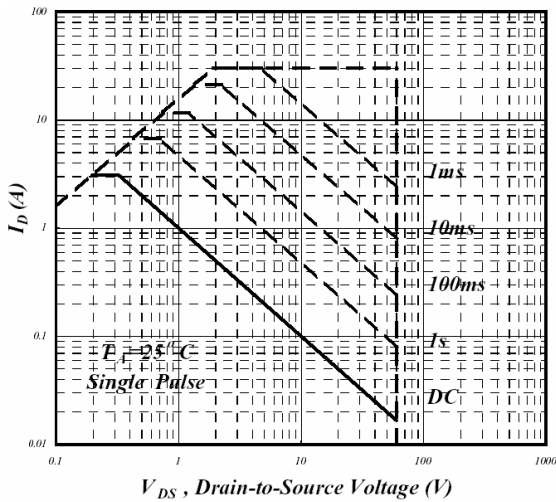


Fig 9. Maximum Safe Operating Area

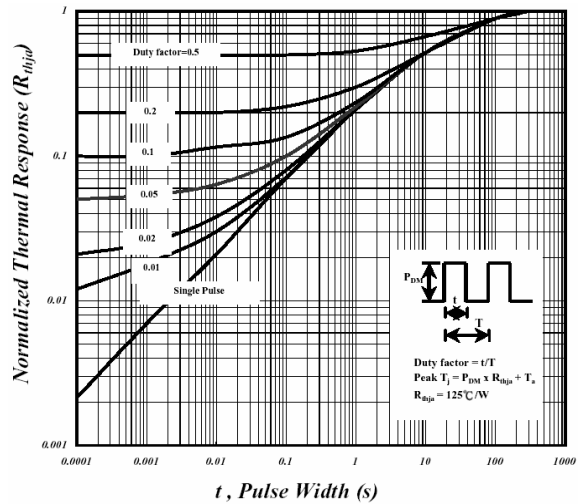


Fig 10. Effective Transient Thermal Impedance

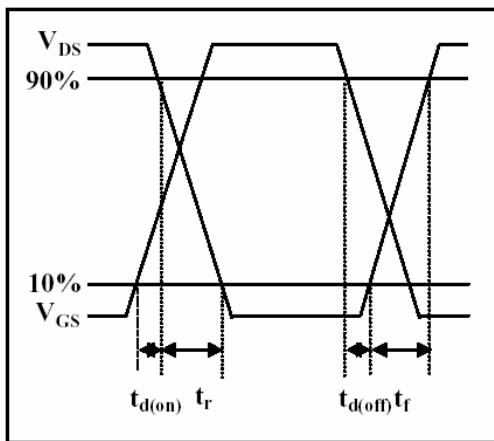


Fig 11. Switching Time Waveform

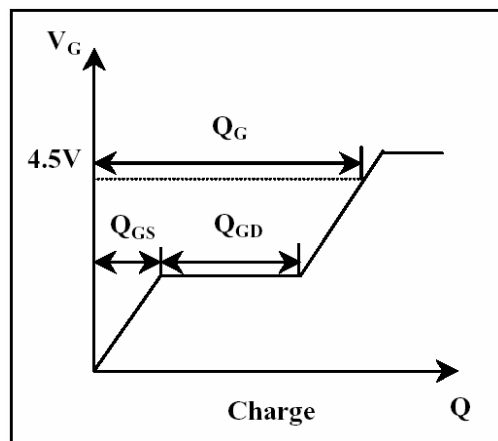


Fig 12. Gate Charge Waveform

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