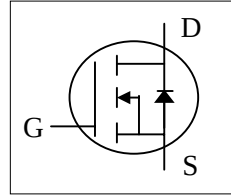


N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

Lower Gate Charge
Simple Drive Requirement
Fast Switching Characteristic

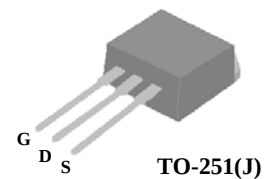
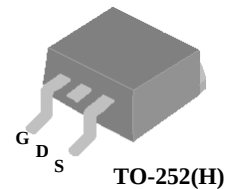


BV_{DSS}	30V
$R_{DS(ON)}$	10m Ω
I_D	57A

DESCRIPTION

The advanced power MOSFETs from Silicon Standard Corp. provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (SSM9408GH) are available for low-profile applications.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current	57	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current	41	A
I_{DM}	Pulsed Drain Current ¹	228	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	53.6	W
	Linear Derating Factor	0.36	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

THERMAL DATA

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case Max.	2.8	$^\circ\text{C}/\text{W}$
Rthj-a	Thermal Resistance Junction-ambient Max.	110	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

($T_J=25^{\circ}\text{C}$ unless otherwise specified)

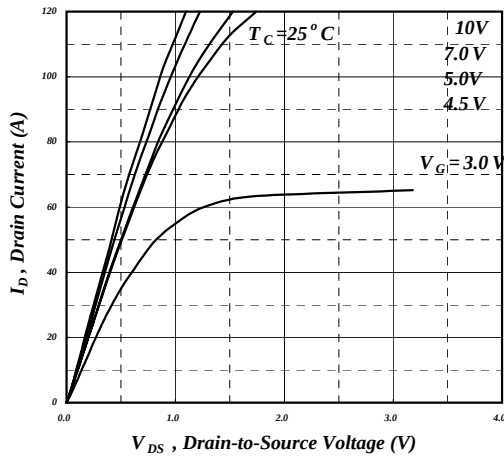
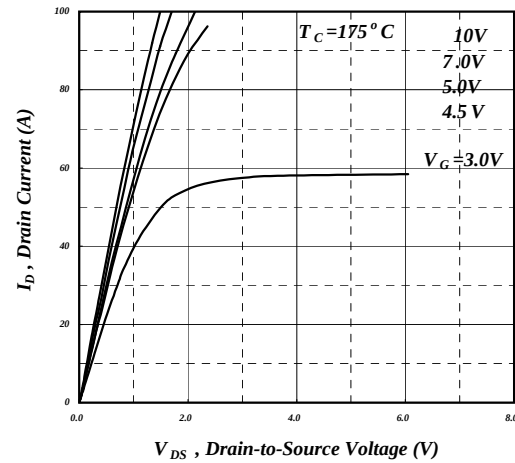
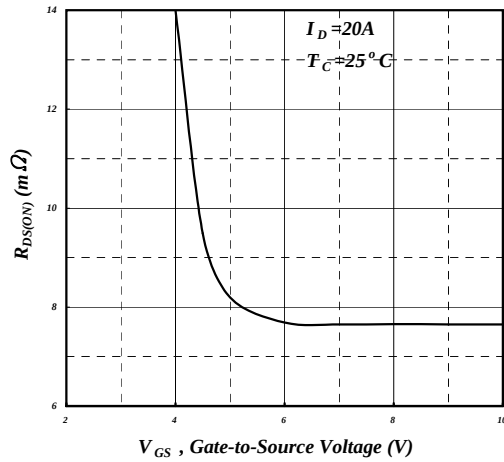
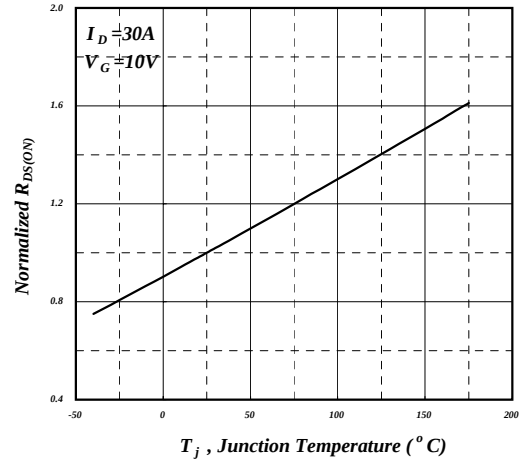
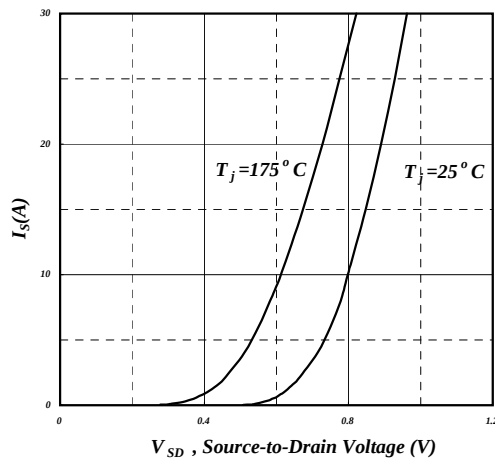
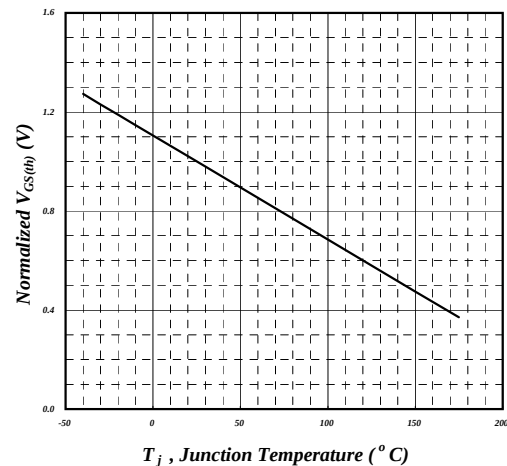
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25°C , $I_D=250\mu A$	-	0.02	-	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=30A$	-	-	10	$m\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	-	12	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	2.5	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=30A$	-	30	-	S
I_{DSS}	Drain-Source Leakage Current ($T_J=25^{\circ}\text{C}$)	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
	Drain-Source Leakage Current ($T_J=175^{\circ}\text{C}$)	$V_{DS}=24V, V_{GS}=0V$	-	-	500	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=10A$	-	13	21	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=24V$	-	2.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	7	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=15V$	-	8	-	ns
t_r	Rise Time	$I_D=1A$	-	6	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	24	-	ns
t_f	Fall Time	$R_D=15\Omega$	-	9	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	860	1380	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	210	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	150	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	2	3	Ω

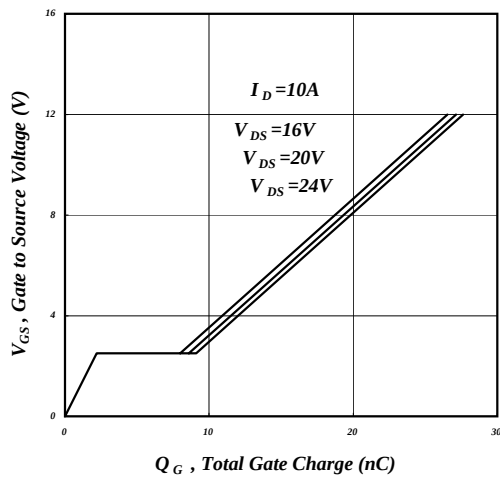
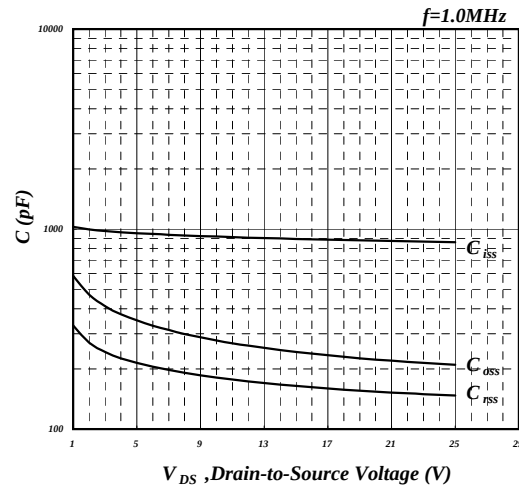
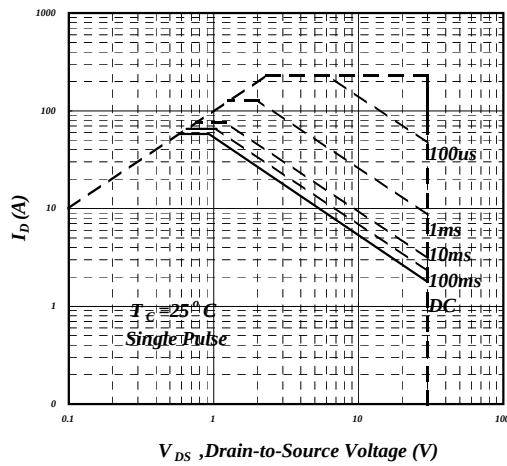
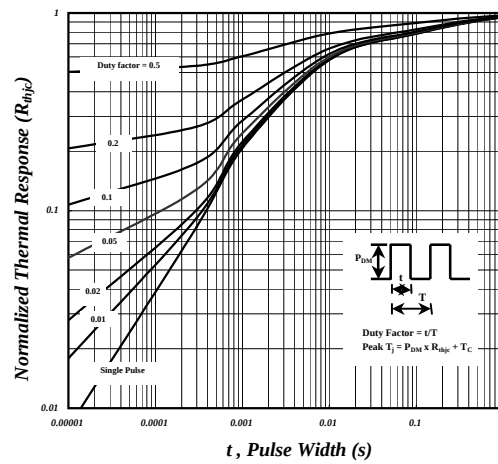
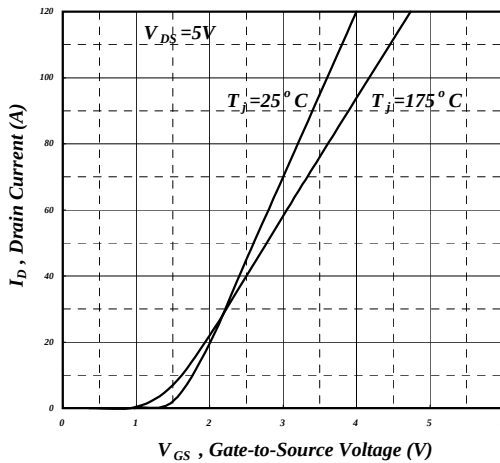
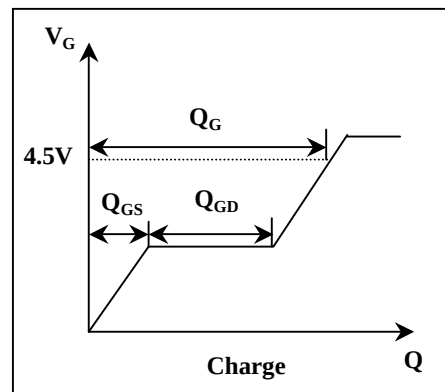
SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=30A, V_{GS}=0V$	-	-	1.2	V
t_{rr}	Reverse Recovery Time ²	$I_S=10A, V_{GS}=0V,$	-	23	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	17	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test


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. Transfer Characteristics

Fig 12. Gate Charge Waveform

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