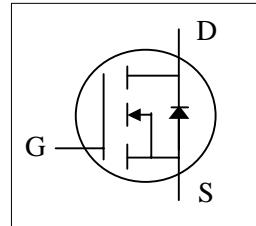


N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

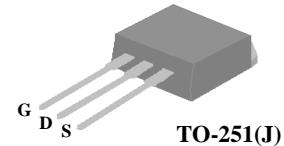
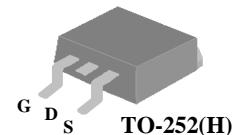
Repetitive Avalanche Rated
Fast Switching Speed
Simple Drive Requirement



BV_{DSS}	600V
$R_{DS(ON)}$	3.6Ω
I_D	3.3A

DESCRIPTION

The TO-252 package is universally preferred for all commercial-Industrial surface mount applications and suited for AC/DC converters. The through-hole version (SSM03N70GH/GJ) is available for low-profile applications.



RoHS-compliant

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Units
V_{DS}	Drain-Source Voltage		V
V_{GS}	Gate-Source Voltage	±30	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$		A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$		A
I_{DM}	Pulsed Drain Current ¹	13.2	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation	45	W
	Linear Derating Factor	0.36	W/°C
E_{AS}	Single Pulse Avalanche Energy ²	85	mJ
I_{AR}	Avalanche Current	3.3	A
E_{AR}	Repetitive Avalanche Energy	3.3	mJ
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

THERMAL DATA

Symbol	Parameter	Value	Units
R_{thj-c}	Thermal Resistance Junction-case	Max.	°C/W
R_{thj-a}	Thermal Resistance Junction-ambient	Max.	°C/W

ELECTRICAL CHARACTERISTICS

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

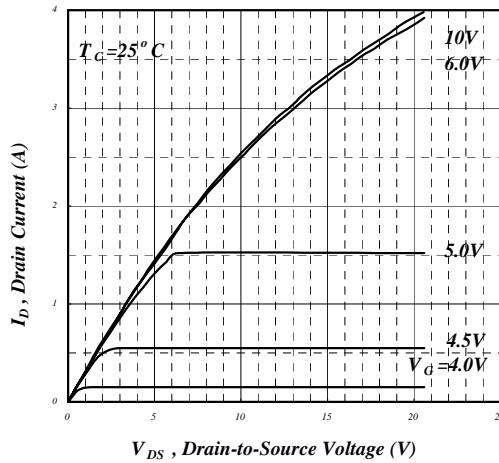
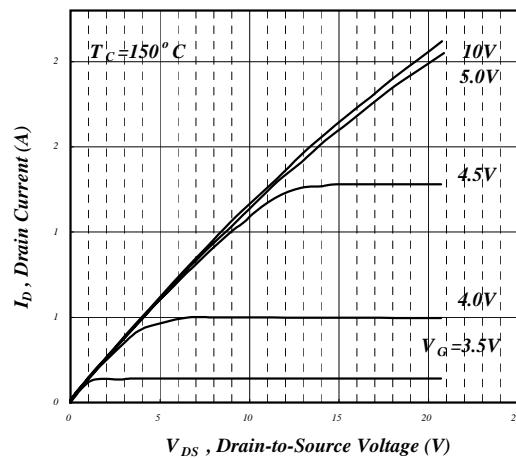
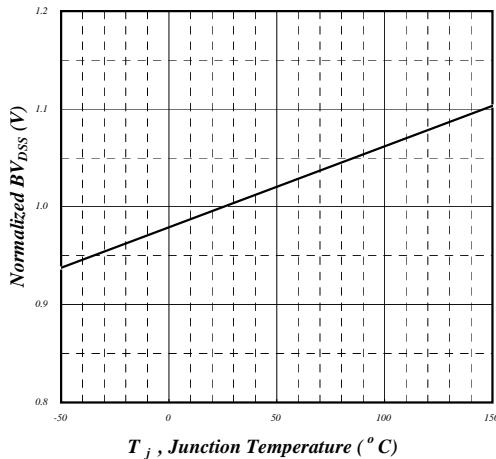
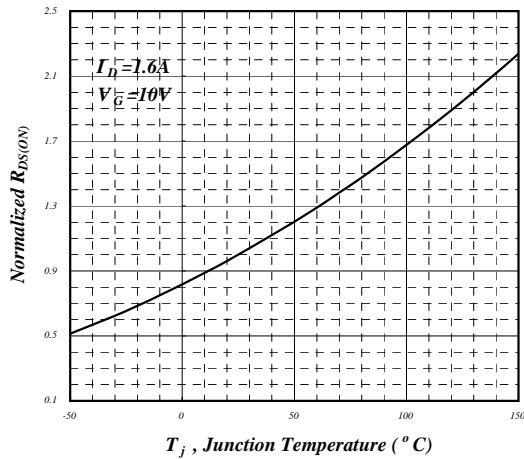
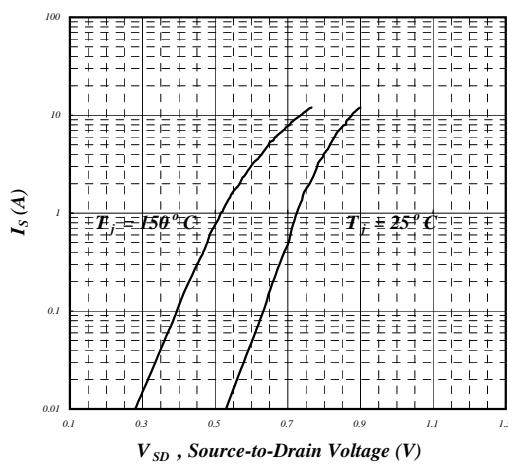
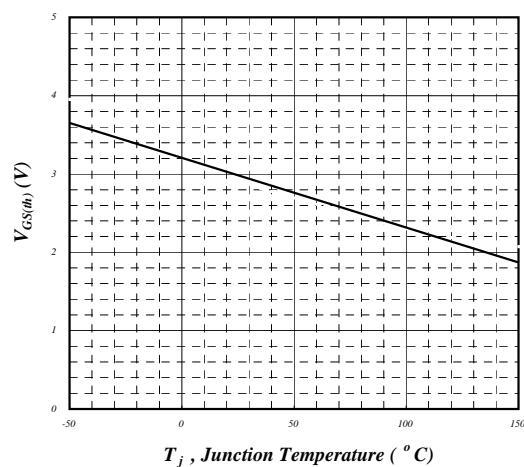
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$, $I_D=250\mu\text{A}$	600	-	-	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	-	0.6	-	$\text{V}/^\circ\text{C}$
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{\text{GS}}=10\text{V}$, $I_D=1.6\text{A}$	-	-	3.6	Ω
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}$, $I_D=250\mu\text{A}$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{\text{DS}}=10\text{V}$, $I_D=1.6\text{A}$	-	2	-	S
I_{DSS}	Drain-Source Leakage Current ($T_j=25^\circ\text{C}$)	$V_{\text{DS}}=600\text{V}$, $V_{\text{GS}}=0\text{V}$	-	-	10	μA
	Drain-Source Leakage Current ($T_j=150^\circ\text{C}$)	$V_{\text{DS}}=480\text{V}$, $V_{\text{GS}}=0\text{V}$	-	-	100	μA
I_{GSS}	Gate-Source Leakage	$V_{\text{GS}}=\pm 30\text{V}$	-	-	± 100	nA
Q_g	Total Gate Charge ³	$I_D=3.3\text{A}$	-	11.4	-	nC
Q_{gs}	Gate-Source Charge	$V_{\text{DS}}=480\text{V}$	-	3.1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{\text{GS}}=10\text{V}$	-	4.2	-	nC
$t_{\text{d(on)}}$	Turn-on Delay Time ³	$V_{\text{DD}}=300\text{V}$	-	8.4	-	ns
t_r	Rise Time	$I_D=3.3\text{A}$	-	6	-	ns
$t_{\text{d(off)}}$	Turn-off Delay Time	$R_G=10\Omega$, $V_{\text{GS}}=10\text{V}$	-	17.7	-	ns
t_f	Fall Time	$R_D=91\Omega$	-	5.9	-	ns
C_{iss}	Input Capacitance	$V_{\text{GS}}=0\text{V}$	-	600	-	pF
C_{oss}	Output Capacitance	$V_{\text{DS}}=25\text{V}$	-	45	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	4	-	pF

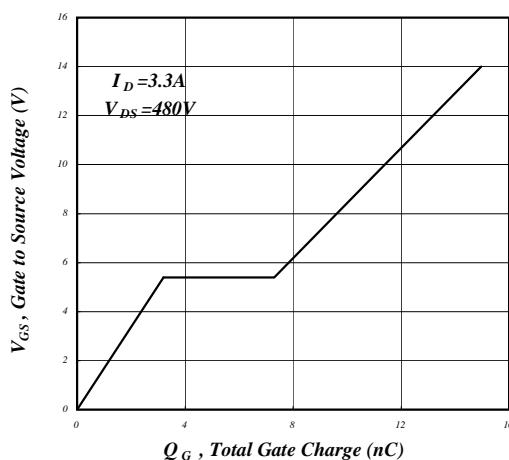
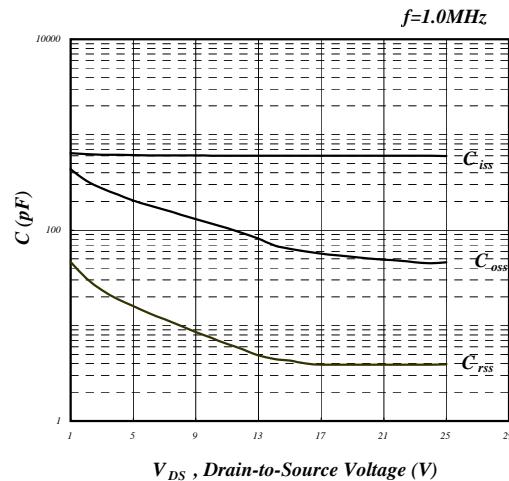
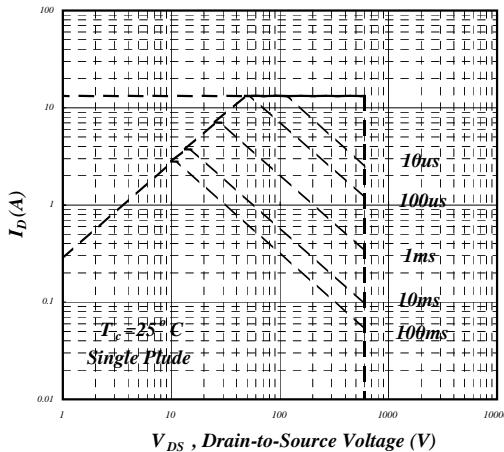
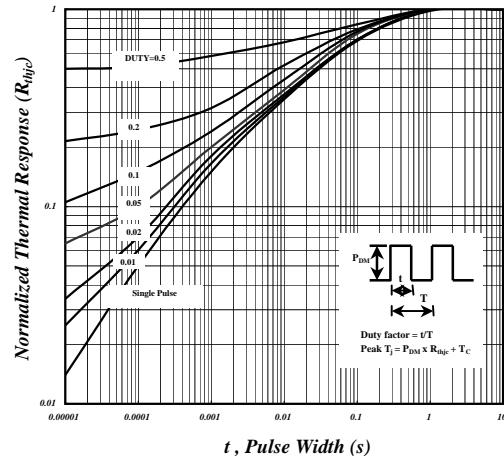
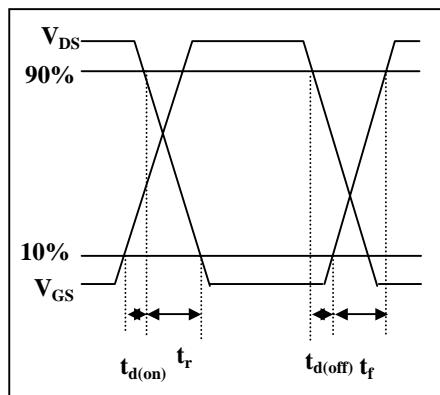
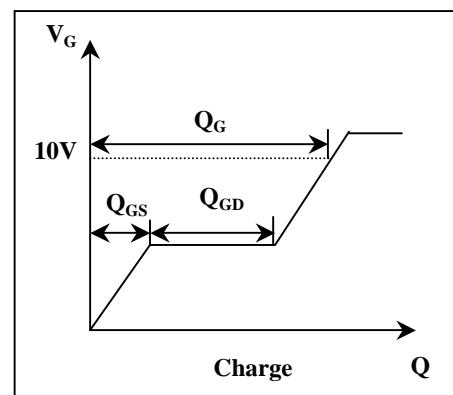
SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ³	$I_S=3\text{A}$, $V_{\text{GS}}=0\text{V}$	-	-	1.5	V
t_{rr}	Reverse Recovery Time ²	$I_S=3\text{A}$, $V_{\text{GS}}=0\text{V}$,	-	422	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100\text{A}/\mu\text{s}$	-	2580	-	nC

Notes:

- 1.Pulse width limited by safe operating area.
- 2.Starting $T_j=25^\circ\text{C}$, $V_{\text{DD}}=50\text{V}$, $L=15\text{mH}$, $R_G=25\Omega$, $I_{\text{AS}}=3\text{A}$.
- 3.Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

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 Waveform

Fig 12. Gate Charge Waveform

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