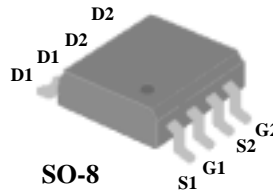


# N-CANNEL ENHANCEMENT MODE POWER MOSFET

## PRODUCT SUMMARY

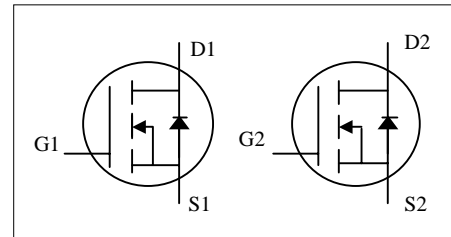
Low On-Resistance  
Simple Drive Requirement  
Dual N MOSFET Package



$BV_{DSS}$	30V
$R_{DS(ON)}$	22m $\Omega$
$I_D$	7.8A

## DESCRIPTION

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



**Pb-free; RoHS-compliant**

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current <sup>3</sup>	7.8	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current <sup>3</sup>	6.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	30	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	2	W
	Linear Derating Factor	0.016	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{thj-a}$	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 62.5	$^\circ C/W$

## 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	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^{\circ}\text{C}$ , $I_D=1\text{mA}$	-	0.02	-	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=7A$	-	-	22	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	-	32	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=7A$	-	12	-	S
$I_{DSS}$	Drain-Source Leakage Current ( $T_J=25^{\circ}\text{C}$ )	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
	Drain-Source Leakage Current ( $T_J=70^{\circ}\text{C}$ )	$V_{DS}=24V, V_{GS}=0V$	-	-	25	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge <sup>2</sup>	$I_D=7A$	-	13	21	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=24V$	-	3	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	9	-	nC
$t_{d(on)}$	Turn-on Delay Time <sup>2</sup>	$V_{DS}=15V$	-	10	-	ns
$t_r$	Rise Time	$I_D=1A$	-	7	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	22	-	ns
$t_f$	Fall Time	$R_D=15\Omega$	-	8	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	720	1150	pF
$C_{oss}$	Output Capacitance	$V_{DS}=25V$	-	230	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	200	-	pF
$R_g$	Gate Resistance	$f=1.0\text{MHz}$	-	1.2	1.8	$\Omega$

## SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{SD}$	Forward On Voltage <sup>2</sup>	$I_S=1.7A, V_{GS}=0V$	-	-	1.2	V
$t_{rr}$	Reverse Recovery Time <sup>2</sup>	$I_S=7A, V_{GS}=0V,$	-	16	-	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	8	-	nC

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board,  $t \leq 10\text{sec}$ ;  $135^{\circ}\text{C}/W$  when mounted on Min. copper pad.

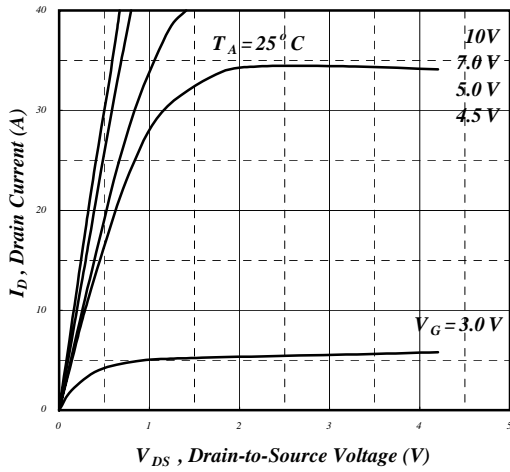


Fig 1. Typical Output Characteristics

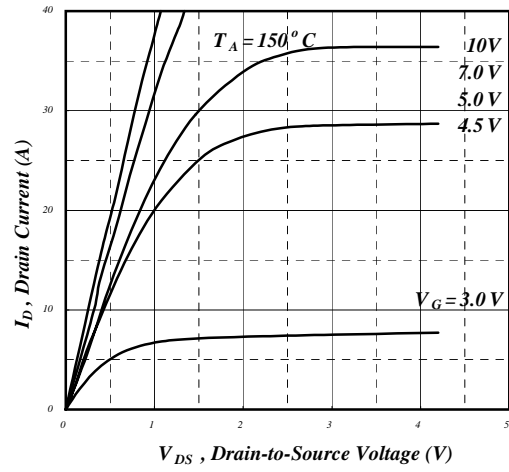


Fig 2. Typical Output Characteristics

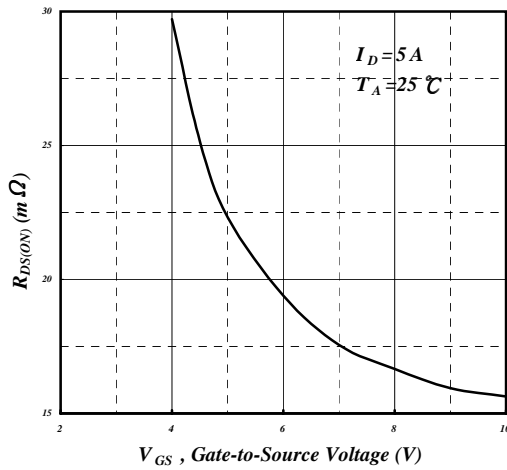


Fig 3. On-Resistance v.s. Gate Voltage

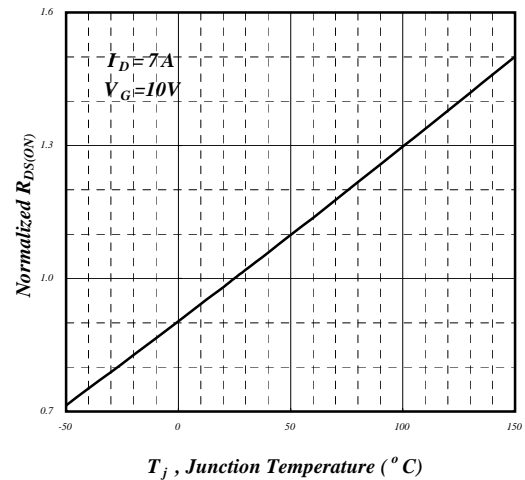


Fig 4. Normalized On-Resistance v.s. Junction Temperature

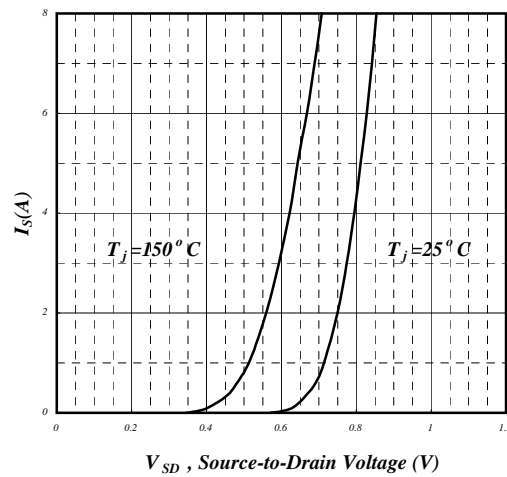


Fig 5. Forward Characteristic of Reverse Diode

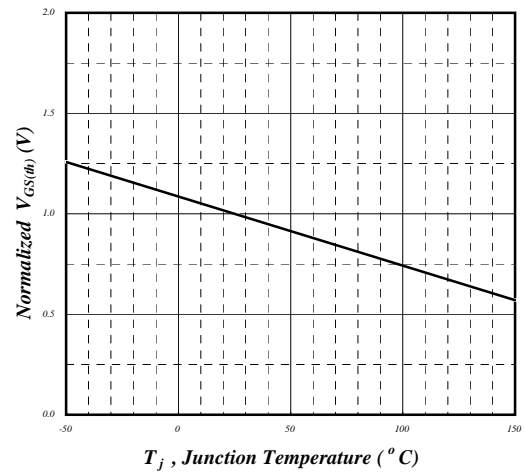
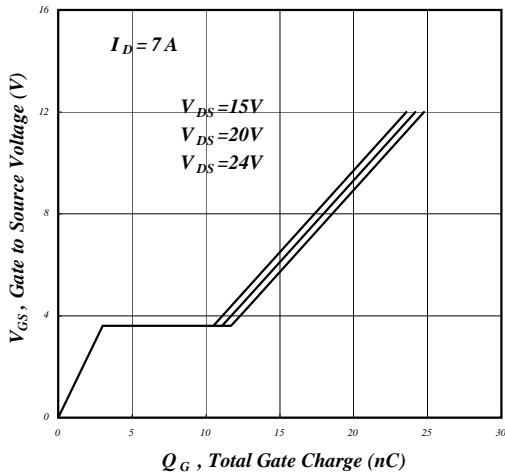
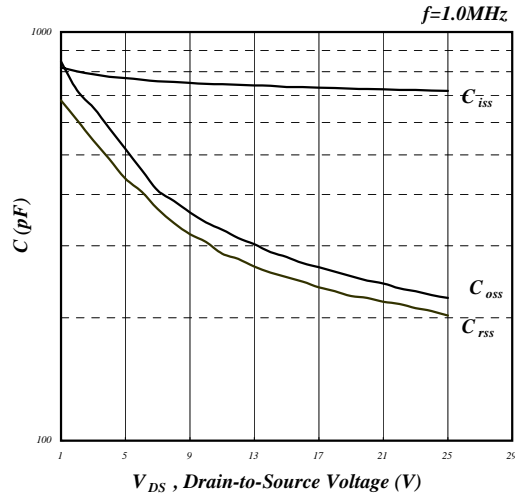


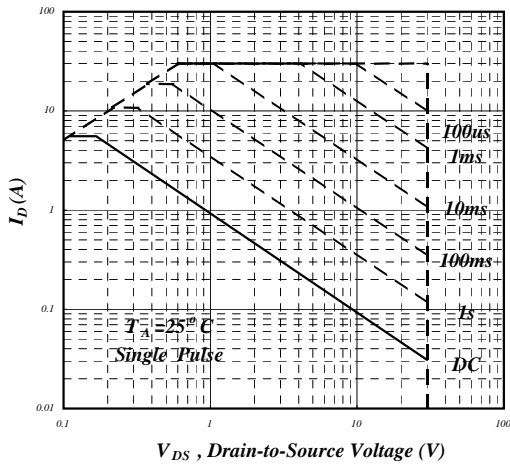
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



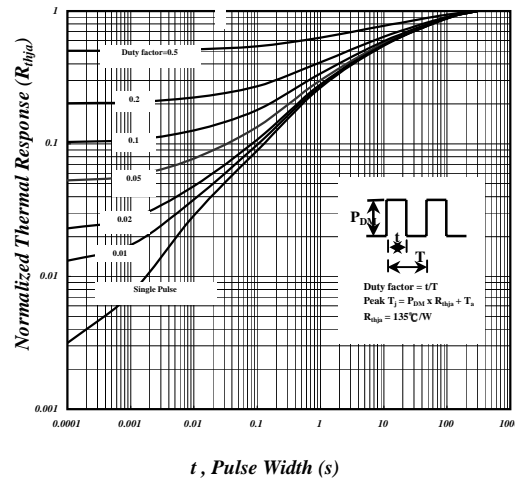
**Fig 7. Gate Charge Characteristics**



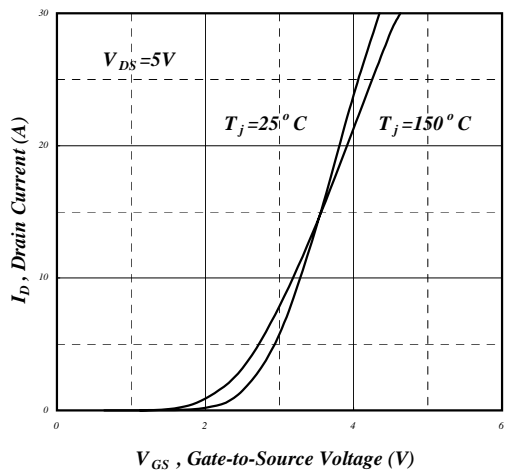
**Fig 8. Typical Capacitance Characteristics**



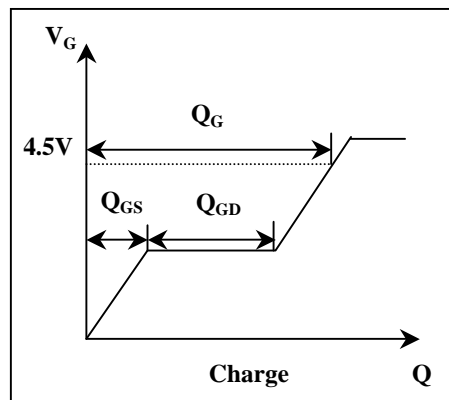
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Transfer Characteristics**



**Fig 12. Gate Charge Waveform**

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