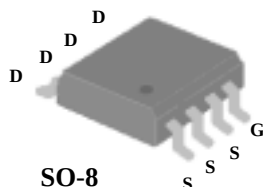


N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

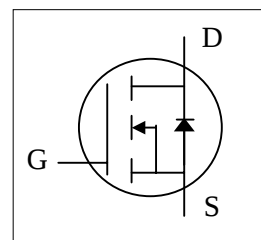
Low On-Resistance
Fast Switching Speed
Surface Mount Package



BV_{DSS}	40V
$R_{DS(ON)}$	15m Ω
I_D	10A

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	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ³	10	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ³	8	A
I_{DM}	Pulsed Drain Current ¹	48	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	2.5	W
	Linear Derating Factor	0.02	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	Thermal Resistance Junction-ambient ³ Max.	50	$^\circ\text{C}/\text{W}$

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	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25°C , $I_D=1mA$	-	0.032	-	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=10A$	-	-	15	$m\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	-	25	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=10A$	-	35	-	S
I_{DSS}	Drain-Source Leakage Current ($T_J=25^{\circ}\text{C}$)	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
	Drain-Source Leakage Current ($T_J=70^{\circ}\text{C}$)	$V_{DS}=32V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=10A$	-	14.7	-	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=20V$	-	7.1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	6.8	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=20V$	-	11.5	-	ns
t_r	Rise Time	$I_D=1A$	-	6.3	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	28.2	-	ns
t_f	Fall Time	$R_D=20\Omega$	-	12.6	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	1725	-	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	235	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0MHz$	-	145	-	pF

SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current (Body Diode)	$V_D=V_G=0V, V_S=1.3V$	-	-	1.92	A
V_{SD}	Forward On Voltage ²	$T_J=25^{\circ}\text{C}, I_S=2.3A, V_{GS}=0V$	-	-	1.3	V

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 in² copper pad of FR4 board ; 125 $^{\circ}\text{C}/W$ when mounted on Min. copper pad.

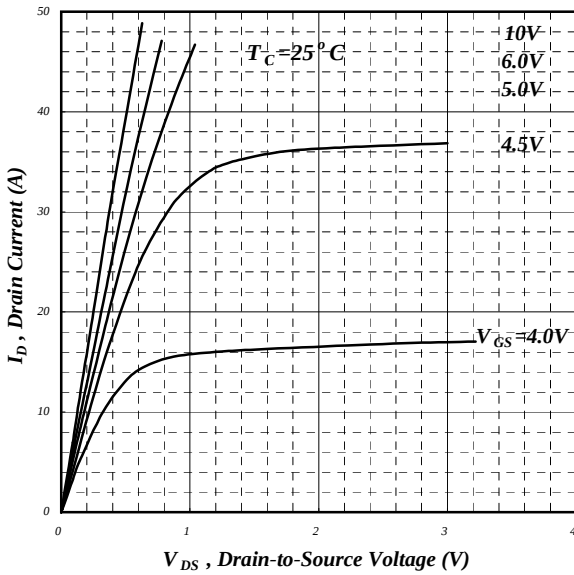


Fig 1. Typical Output Characteristics

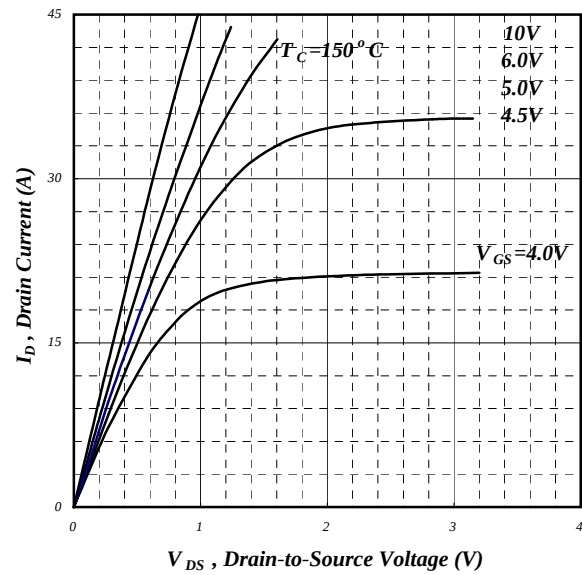


Fig 2. Typical Output Characteristics

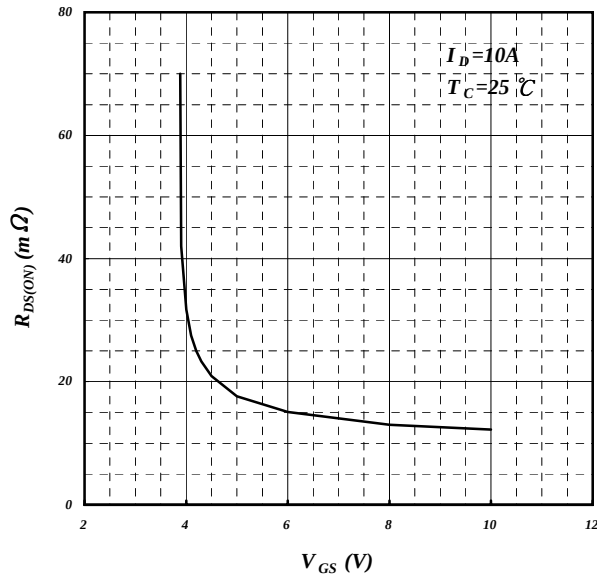
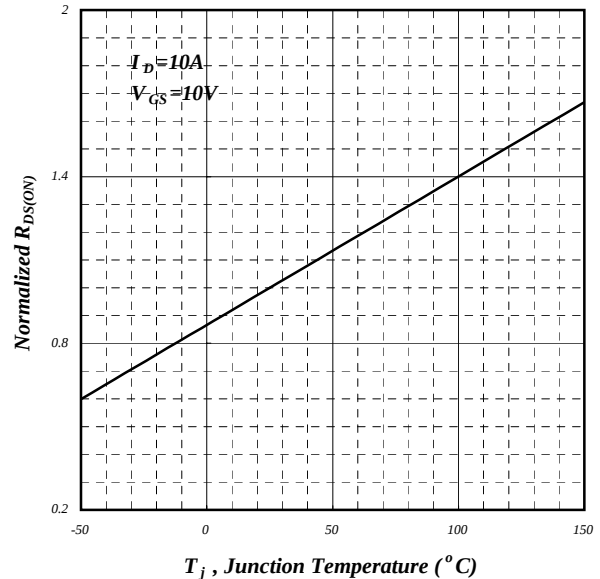


Fig 3. On-Resistance v.s. Gate Voltage



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

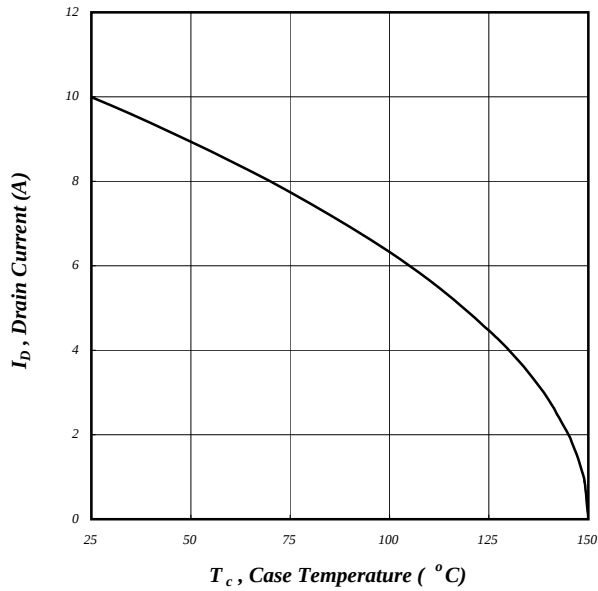


Fig 5. Maximum Drain Current v.s. Case Temperature

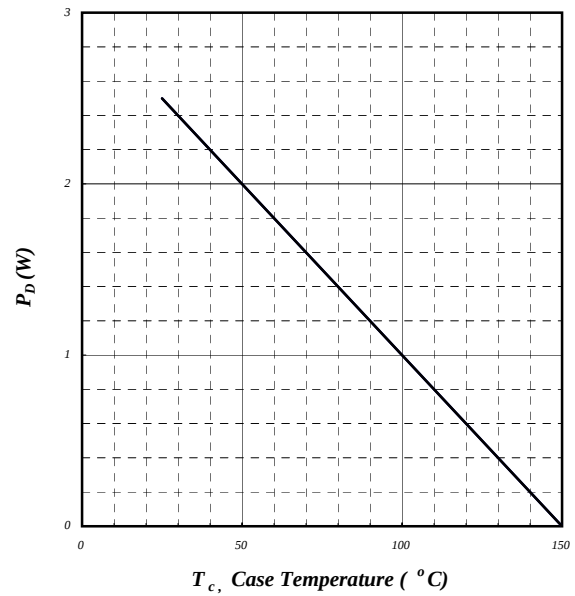


Fig 6. Typical Power Dissipation

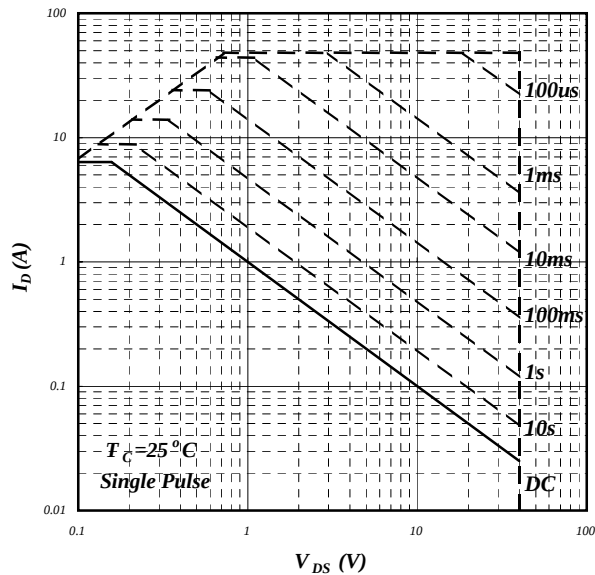


Fig 7. Maximum Safe Operating Area

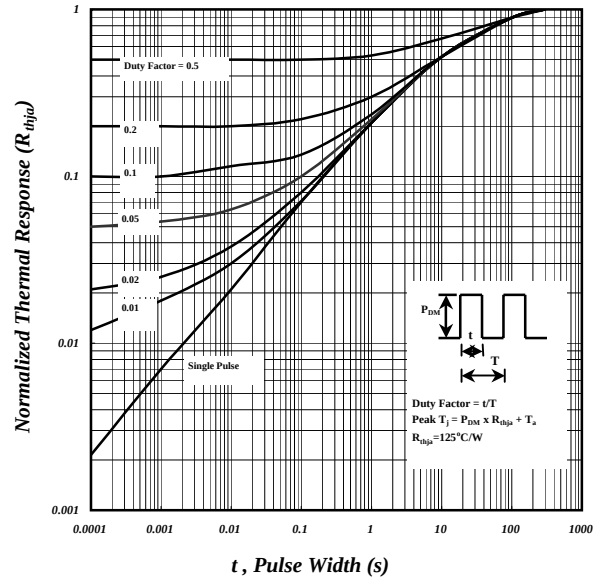
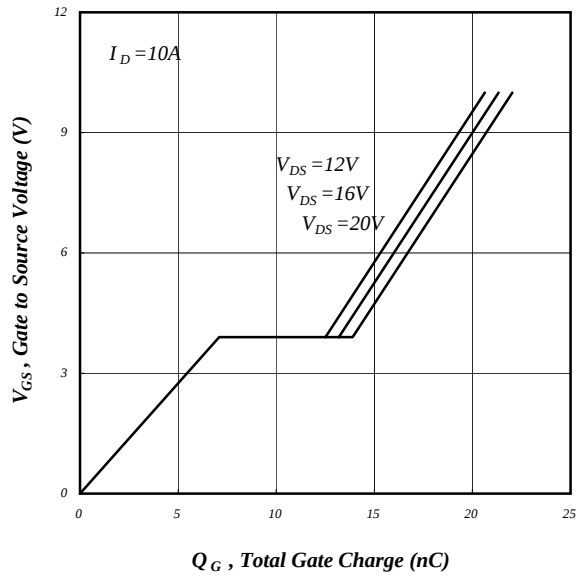
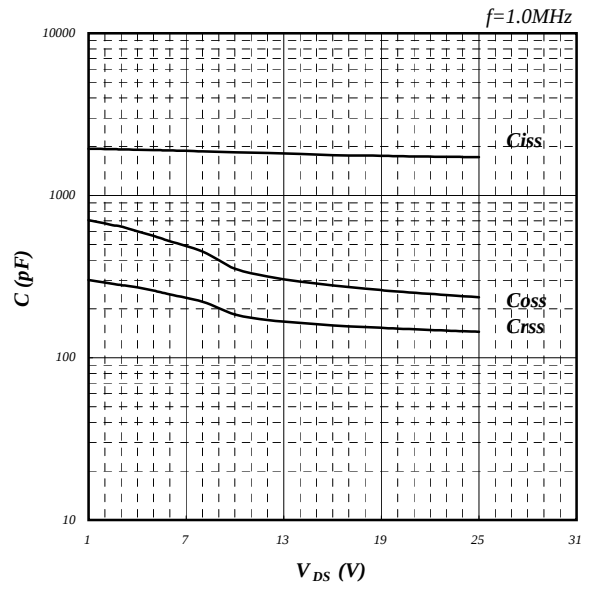
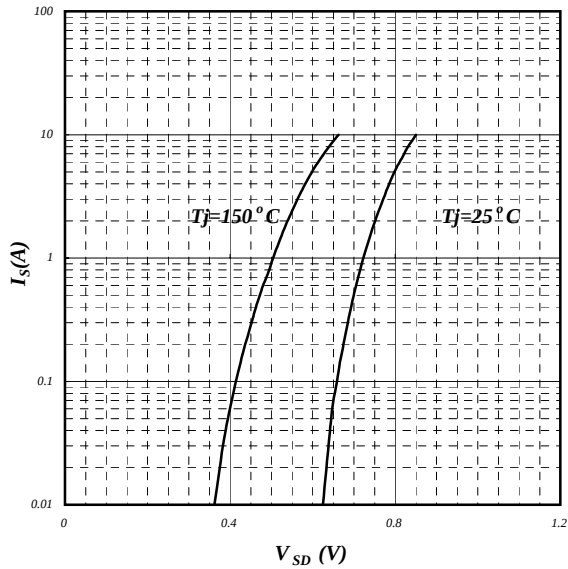
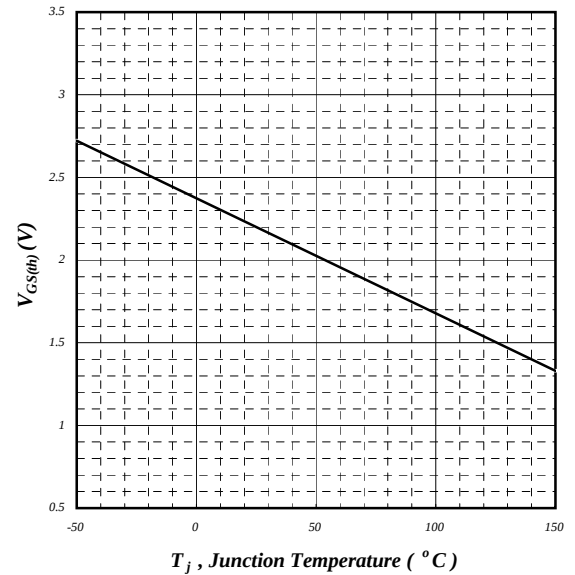
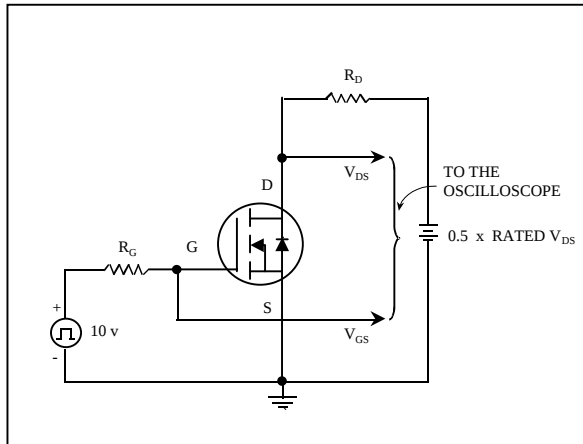
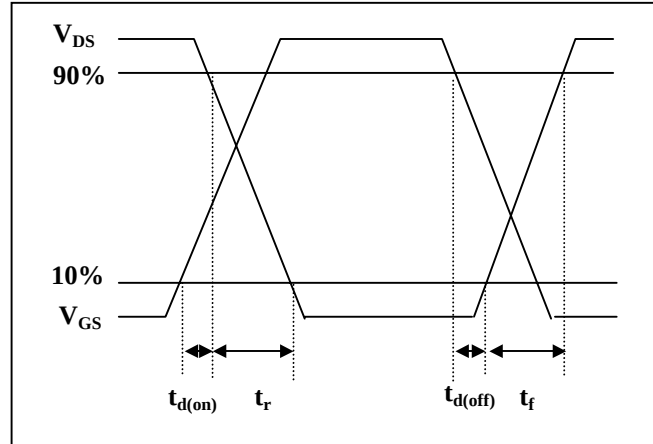
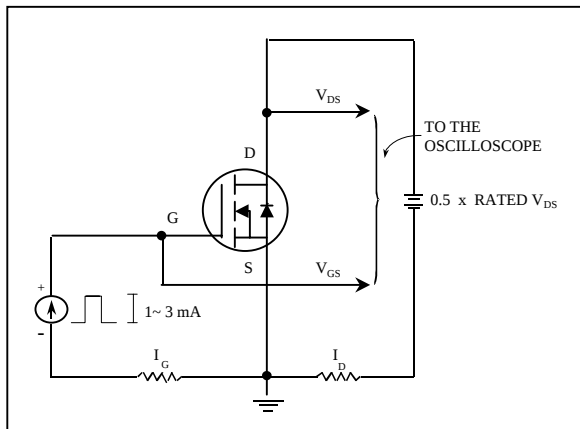
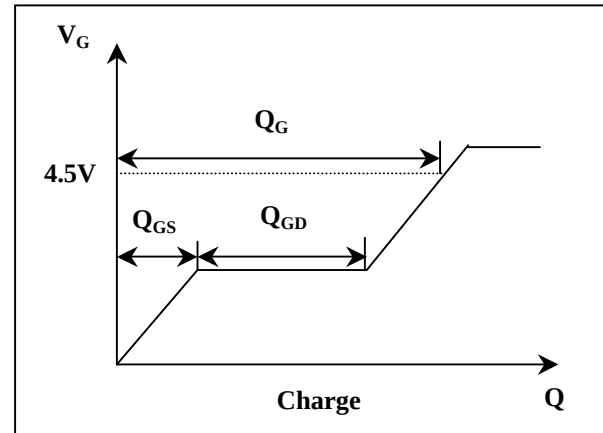


Fig 8. Effective Transient Thermal Impedance


Fig 9. Gate Charge Characteristics

Fig 10. Typical Capacitance Characteristics

Fig 11. Forward Characteristic of Reverse Diode

Fig 12. Gate Threshold Voltage v.s. Junction Temperature


Fig 13. Switching Time Circuit

Fig 14. Switching Time Waveform

Fig 15. Gate Charge Circuit

Fig 16. Gate Charge Waveform

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