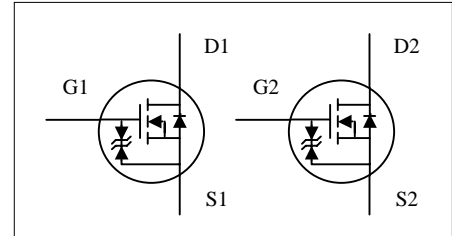


N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

Low on-resistance
Capable of 2.5V gate drive
Optimal DC/DC battery application



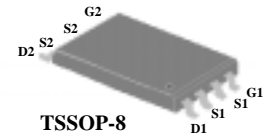
DESCRIPTION

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.

BV_{DSS}	20V
$R_{DS(ON)}$	23m Ω
I_D	5A



Pb-free; RoHS-compliant



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ\text{C}$	Drain Current ³ , V_{GS} @ 4.5V	5	A
$I_D @ T_A = 70^\circ\text{C}$	Drain Current ³ , V_{GS} @ 4.5V	3.5	A
I_{DM}	Pulsed Drain Current ¹	25	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	1	W
	Linear Derating Factor	0.008	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
Rthj-a	Thermal Resistance Junction-ambient ³ Max.	125	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS @T_j=25° C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.02	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =5A	-	-	23	mΩ
		V _{GS} =2.5V, I _D =2A	-	-	29	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.5	-	-	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =5A	-	21	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =20V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =20V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±12V	-	-	±10	uA
Q _g	Total Gate Charge ²	I _D =5A	-	15.9	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =10V	-	1.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	7.4	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =10V	-	6.2	-	ns
t _r	Rise Time	I _D =1A	-	9	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =4.5V	-	30	-	ns
t _f	Fall Time	R _D =10Ω	-	11	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	530	-	pF
C _{oss}	Output Capacitance	V _{DS} =20V	-	245	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	125	-	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 =1.2V	-	-	0.83	A
V _{SD}	Forward On Voltage ²	T _j =25°C, I _S =5A, V _{GS} =0V	-	-	1.2	V

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 ; 208°C/W when mounted on Min. copper pad.

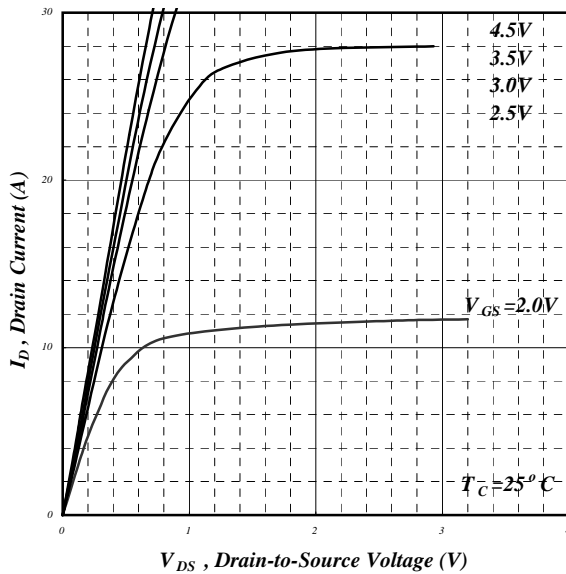


Fig 1. Typical Output Characteristics

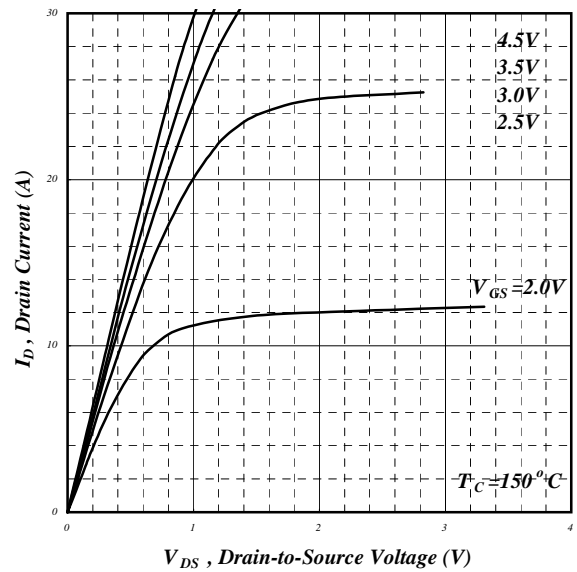


Fig 2. Typical Output Characteristics

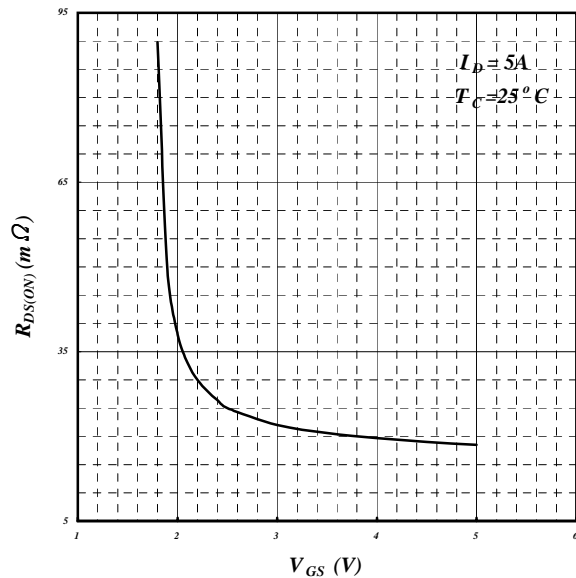


Fig 3. On-Resistance v.s. Gate Voltage

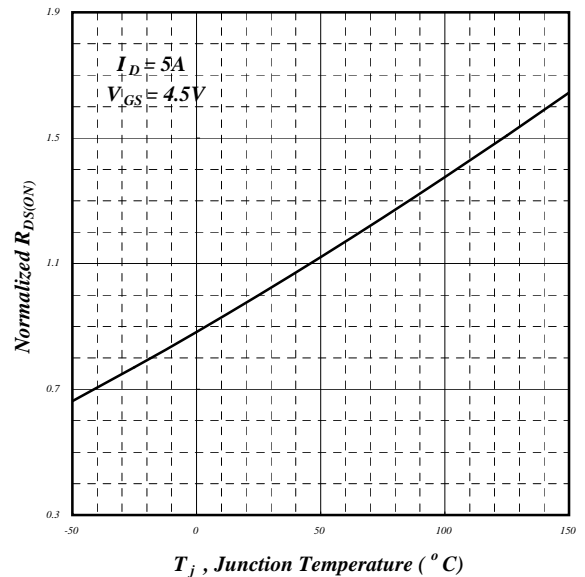


Fig 4. Normalized On-Resistance v.s. Junction Temperature

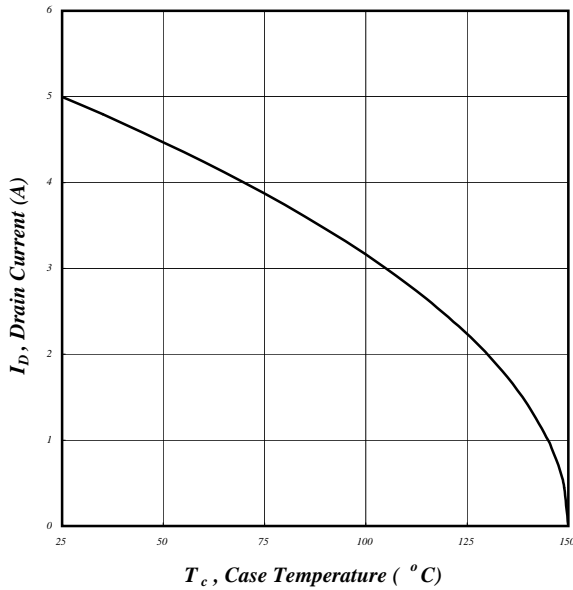


Fig 5. Maximum Drain Current v.s. Case Temperature

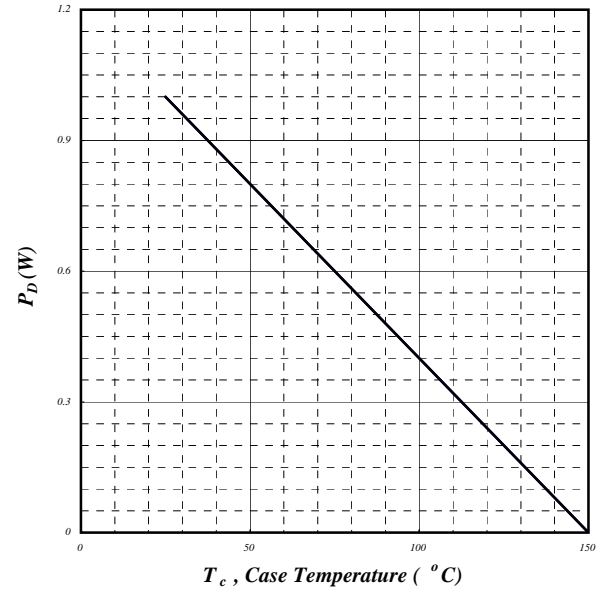


Fig 6. Typical Power Dissipation

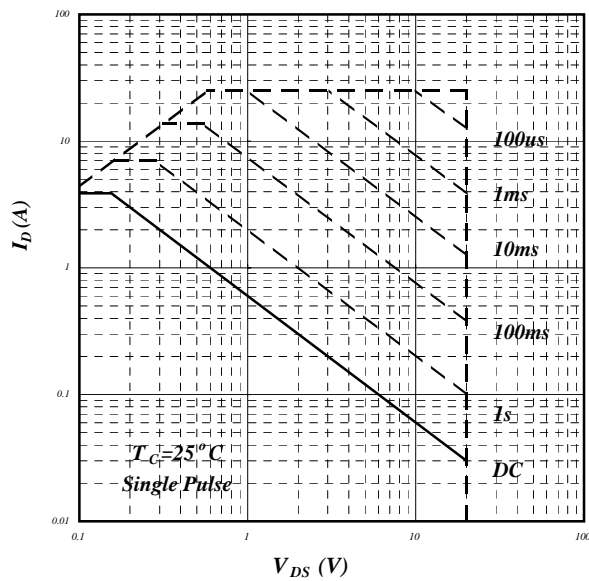


Fig 7. Maximum Safe Operating Area

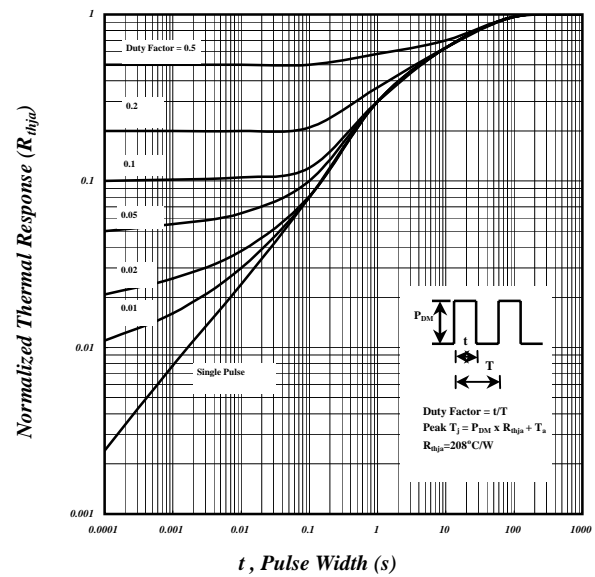


Fig 8. Effective Transient Thermal Impedance

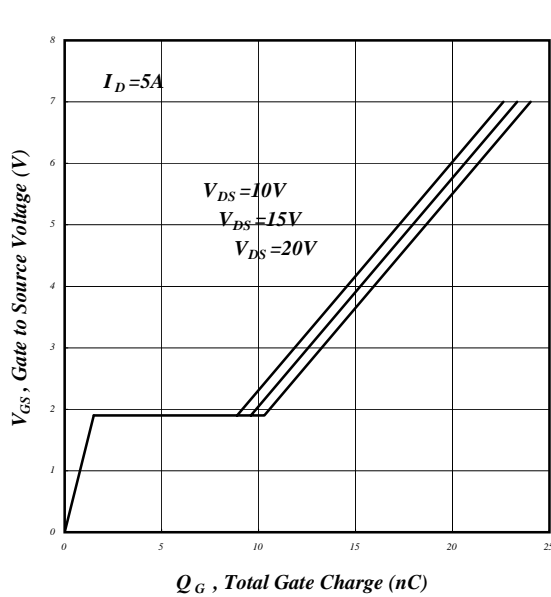


Fig 9. Gate Charge Characteristics

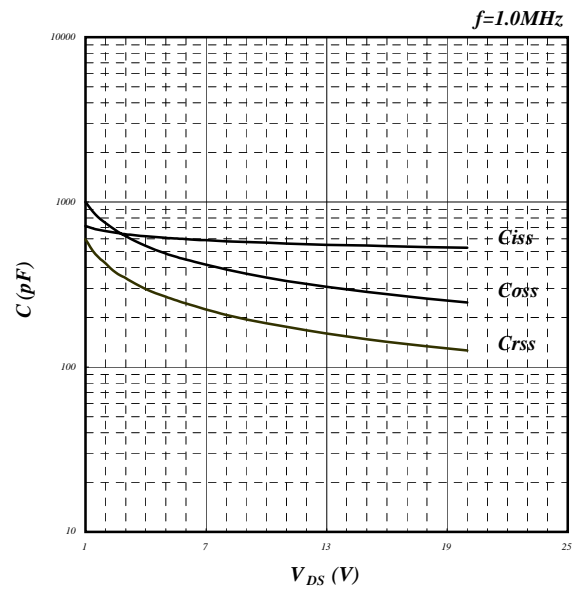


Fig 10. Typical Capacitance Characteristics

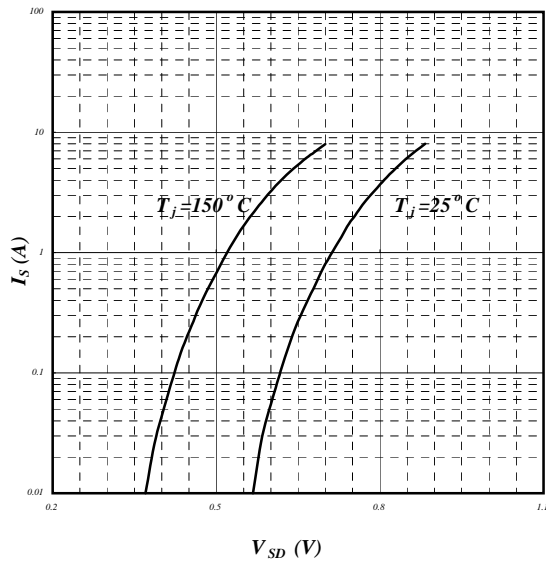


Fig 11. Forward Characteristic of Reverse Diode

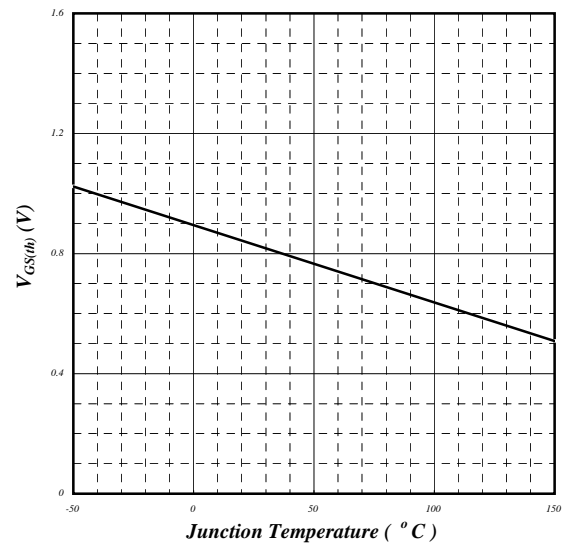
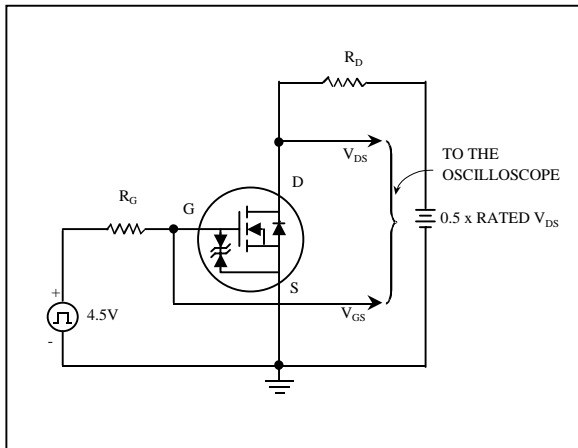
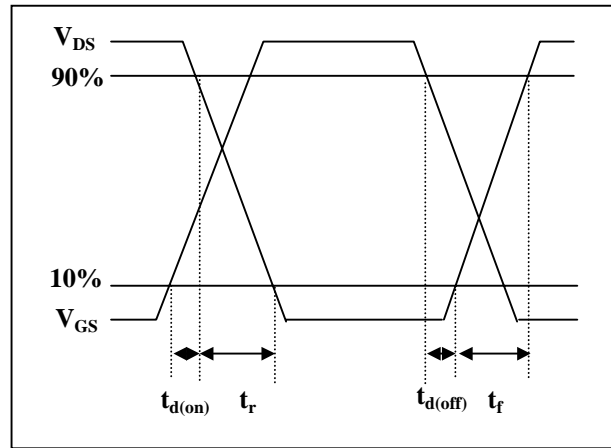
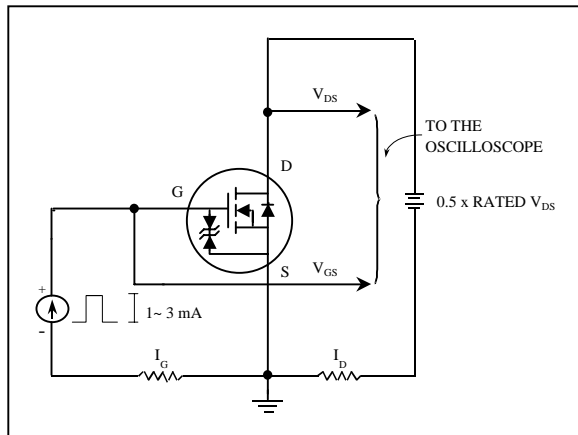
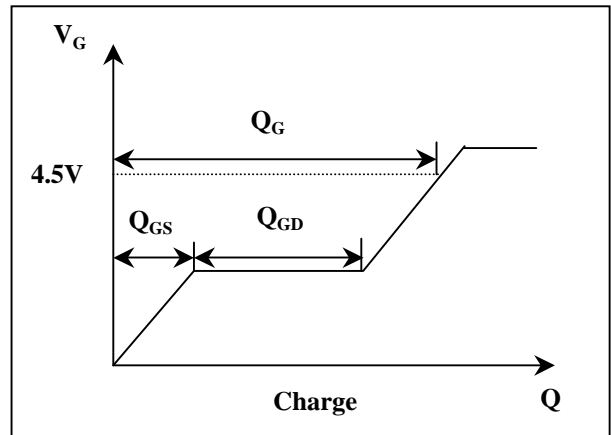


Fig 12. Gate Threshold Voltage v.s. Junction Temperature


Fig 13. Switching Time Circuit

Fig 14. Switching Time Waveform

Fig 15. Gate Charge Circuit

Fig 16. Gate Charge Waveform

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