



P-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	-60 V
I_D	-5 A
$R_{DS(ON)}$ (at $V_{GS}=-10V$)	<55 m
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	<70 m

General Description

Split gate trench MOSFET technology
Extremely low switching loss
Excellent stability and uniformity
Moisture Sensitivity Level 1
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications

Transfer switch
Power MOSFET

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)



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Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =-694 E	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V	-	-	-1	E
		V _{DS} =-60V, V _{GS} =0V, T _J =150°C	-	-	-100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-694 E	-1.5	-2	-3	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-5A	-	40	55	q
		V _{GS} =-4.5V, I _D =-4A	-	50	70	
Diode Forward Voltage	V _{SD}	I _S =-5A, V _{GS} =0V	-	-0.9	-1.2	V
Gate resistance	R _G	f=1MHz, Open drain	-	12	-	
Maximum Body-Diode Continuous Current	I _S		-	-	-5	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHz	-	1050	-	pF
Output Capacitance	C _{oss}		-	380	-	
Reverse Transfer Capacitance	C _{rss}		-	20	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-10V, V _{DS} =-30V, I _D =-5A	-	18.7	-	nC
Gate-Source Charge	Q _{gs}		-	4.7	-	
Gate-Drain Charge	Q _{gd}		-	3	-	
Reverse Recovery Charge	Q _{rr}	I _F =-5A, di/dt=100A/us	-	8	-	nC
Reverse Recovery Time	t _{rr}		-	20	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-30V, I _D =-5A RGEN=2.2	-	7.5	-	ns
Turn-on Rise Time	t _r		-	40	-	
Turn-off Delay Time	t _{D(off)}		-	43	-	
Turn-off fall Time	t _f		-	55	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. P_d is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

C. X_i epi j V NE mqie ih nt li hi q rih r li q m r q q ig q q r h eh mi Om li p p em i r m r q i r nt XE =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



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Typical Electrical and Thermal Characteristics Diagrams

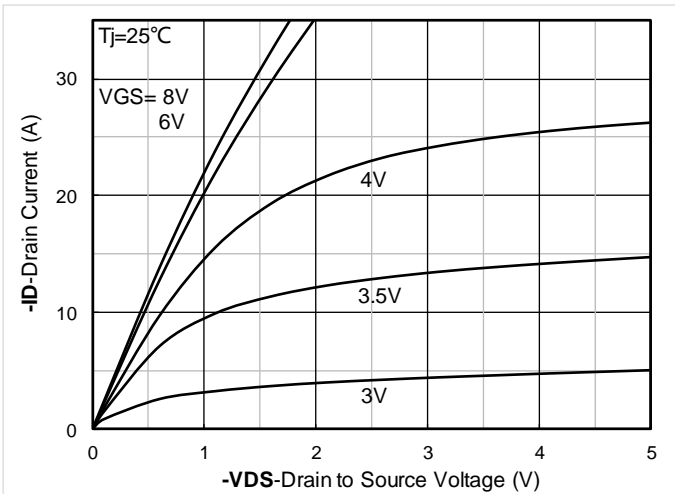


Figure 1. Output Characteristics

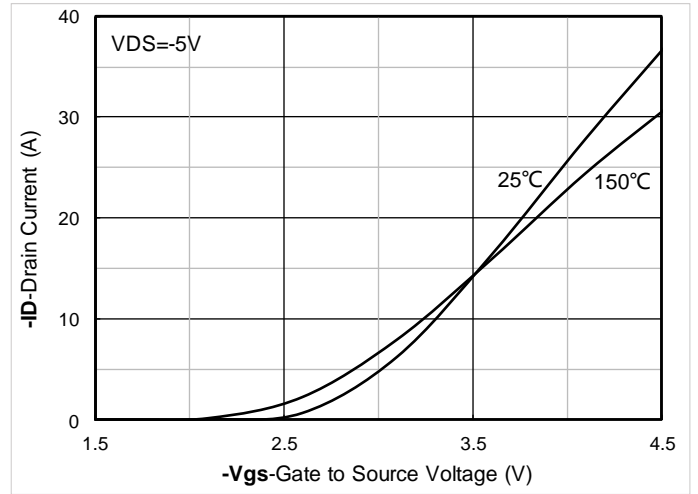


Figure 2. Transfer Characteristics

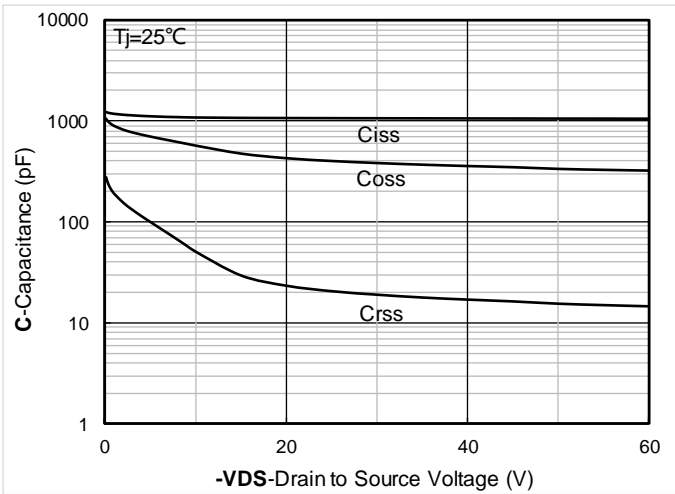


Figure 3. Capacitance Characteristics

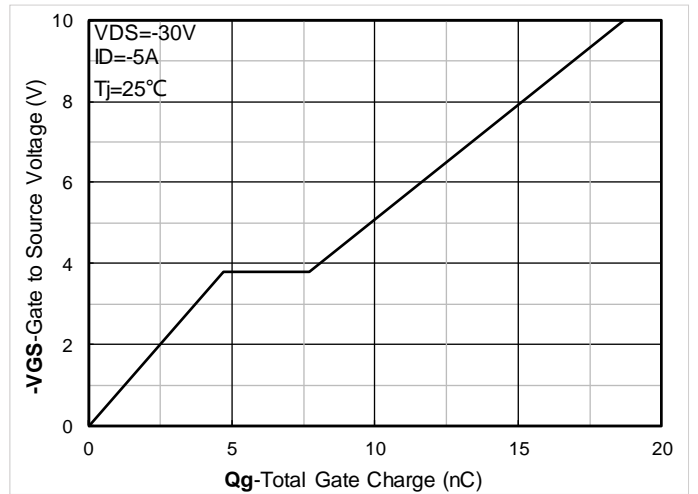


Figure 4. Gate Charge

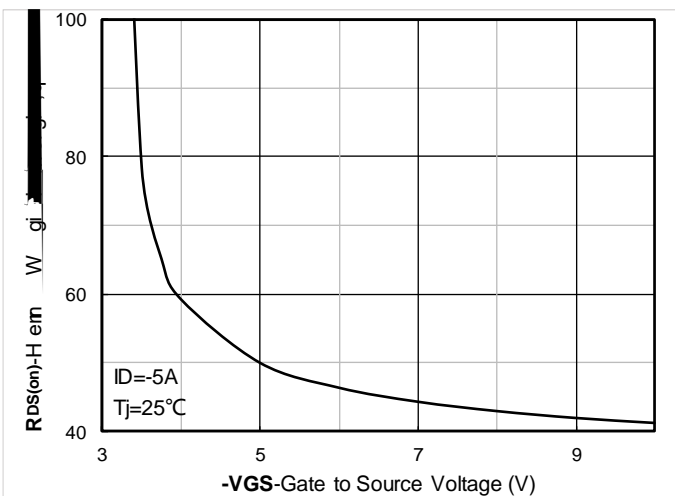


Figure 5. On-Resistance vs Gate to Source Voltage

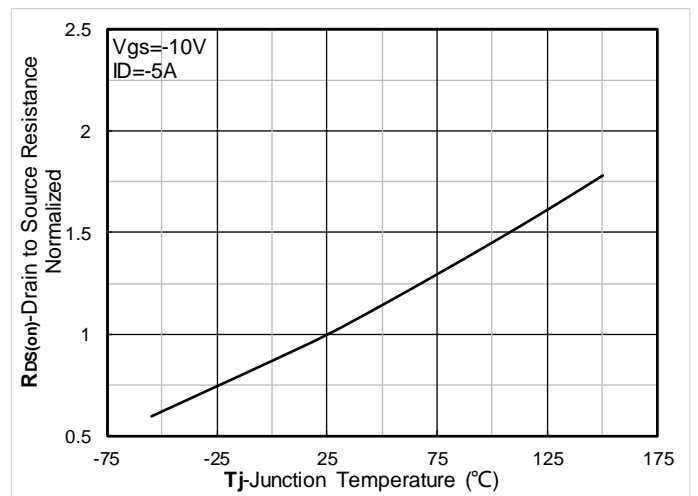


Figure 6. Normalized On-Resistance



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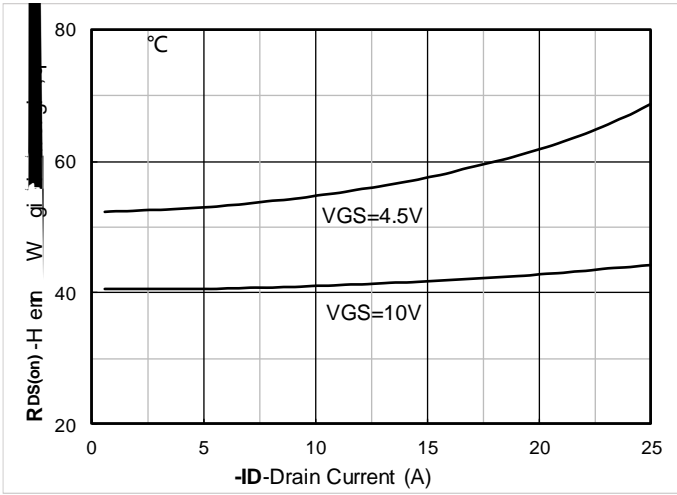


Figure 7. $R_{DS(on)}$ VS Drain Current

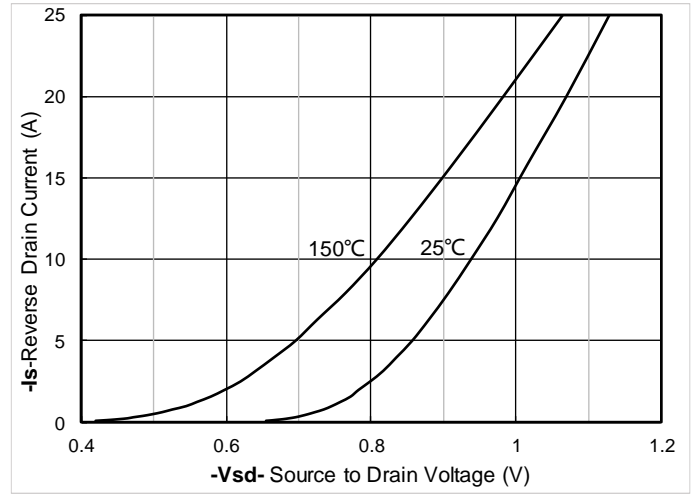


Figure 8. Forward characteristics of reverse diode

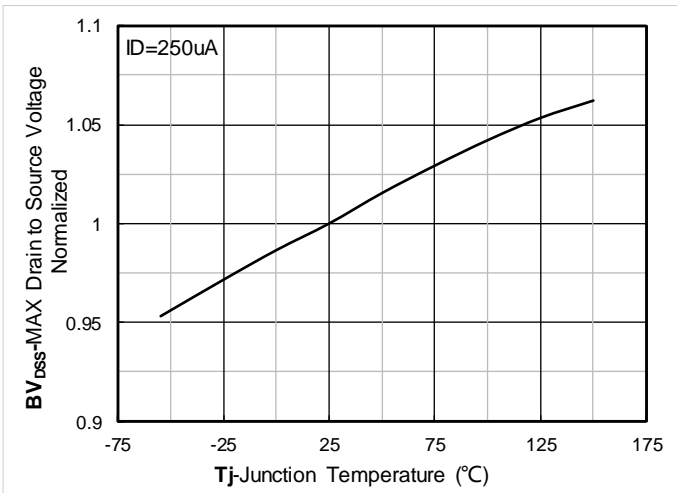


Figure 9. Normalized breakdown voltage

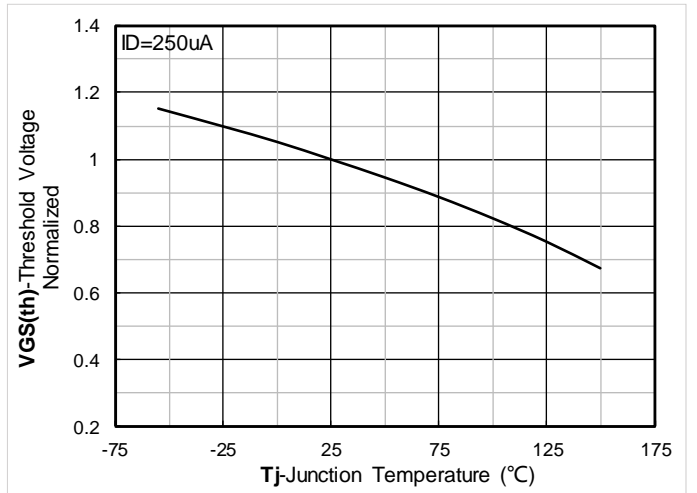


Figure 10. Normalized Threshold voltage

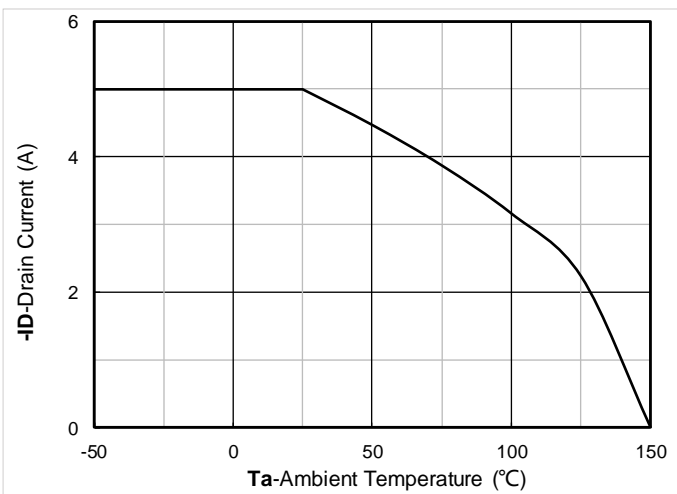


Figure 11. Current dissipation

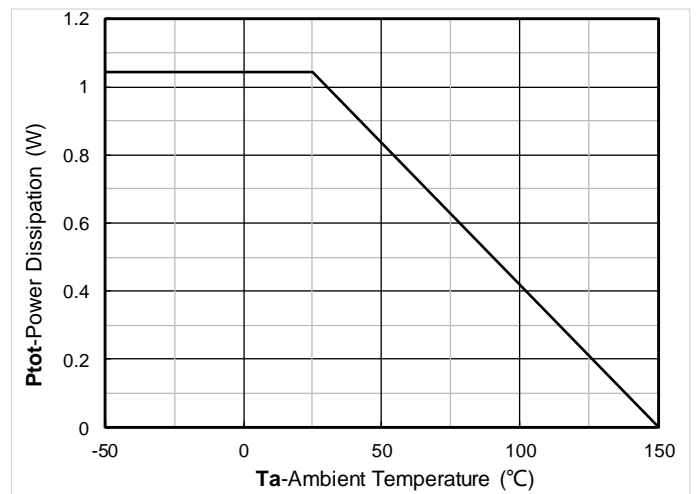


Figure 12. Power dissipation

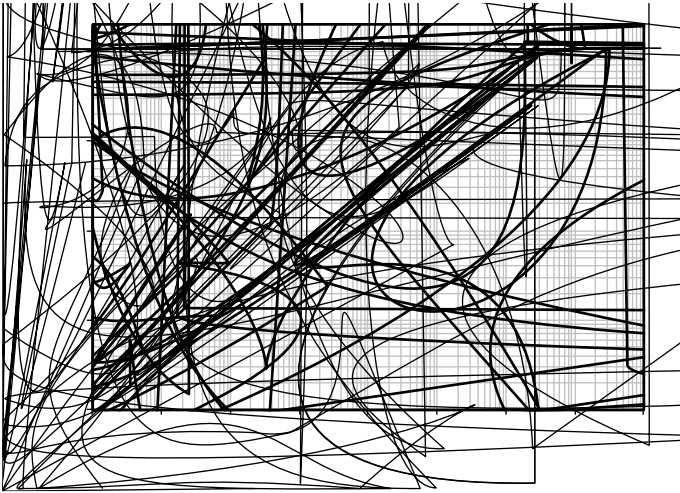


Figure 13. Maximum Transient Thermal Impedance

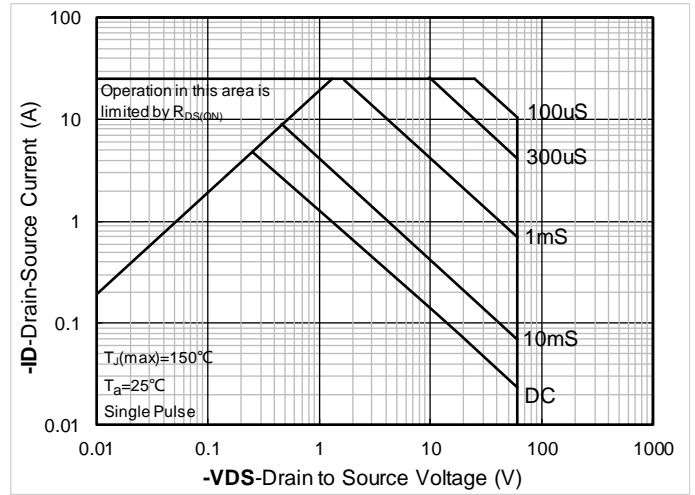
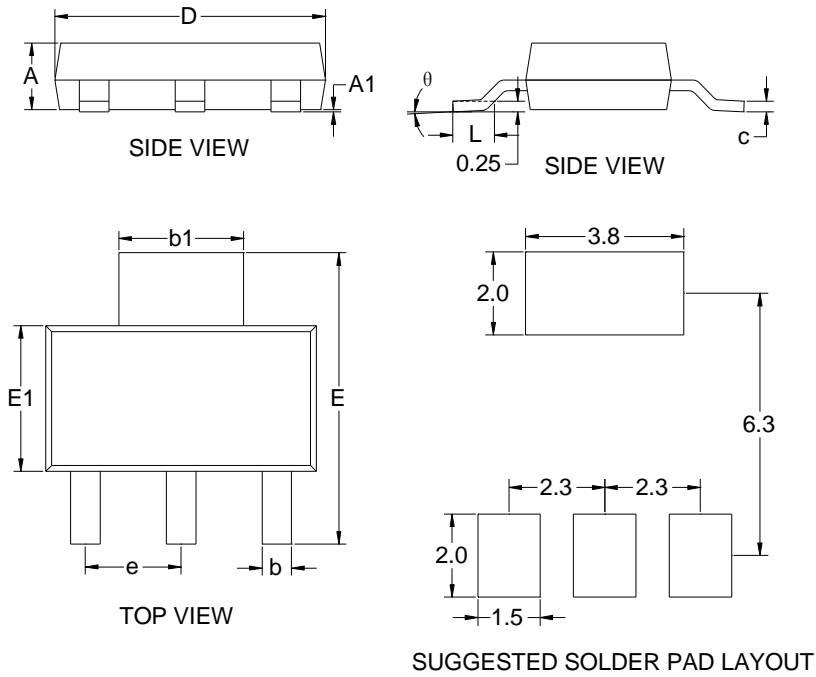


Figure 14. Safe Operation Area



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SOT-223 Package Information



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.0591	0.0670	1.5000	1.7000
A1	0.0008	0.0039	0.0200	0.1000
b	0.0259	0.0330	0.6600	0.8400
b1	0.1140	0.1220	2.9000	3.1000
c	0.0090	0.0138	0.2300	0.3500
D	0.2480	0.2640	6.3000	6.7000
E	0.2637	0.2874	6.7000	7.3000
E1	0.1290	0.1460	3.3000	3.7000
e	0.0866	0.0945	2.2000	2.4000
L	0.0295	0.0492	0.7500	1.2500
θ	0°	10°	0°	10°



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