P-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} -30V
- I_D -4.1A
- $R_{DS(ON)}$(at V_{GS}=-10V) 47mΩ
- $R_{DS(ON)}$(at V_{GS}=-4.5V) 65mΩ

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix “Q” means AEC-Q101 qualified

Applications

- Power management
- Portable equipment

■ Absolute Maximum Ratings (T_A=25 unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	-30	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25	I_D	-4.1	A
	T_A =100		-2.5	
Pulsed Drain Current [A]		I_{DM}	-20	A
Total Power Dissipation [B]	T_A=25	P_D	1.2	W
	T_A =100			

■

PREFERED P/N	PACKING CODE		PACKAGE(pcs)	INNER BOX QUANTITY(pcs)

■ Electrical Characteristics (T_J=25 unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
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=-250μA	-1	-1.5	-2.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.1A		35	47	mΩ
		V_{GS}=-4.5V, I_D=-3.5A		50	65	mΩ
Diode Forward Voltage	V_{SD}	I_S=-4.1A, V_{GS}=0V			-1.2	V
Gate resistance	R_G	f=1MHz		17.5		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		471		pF
Output Capacitance	C_{oss}			84		
Reverse Transfer Capacitance	C_{rss}			69		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-15V, I_D=-4.1A	-	9	-	nC
Gate-Source Charge	Q_{gs}		-	1.5	-	
Gate-Drain Charge	Q_{gd}		-	2.3	-	
Reverse Recovery Charge	Q_{rr}	I_F=-4.1A, di/dt=100A/us	-	12	-	nC
Reverse Recovery Time	t_{rr}		-	32	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-15V, I_D=-4.1A R_{GEN}=2.5Ω	-	9	-	ns
Turn-on Rise Time	t_r			3		
Turn-off Delay Time	$t_{D(off)}$			29		
Turn-off fall Time	t_f			15		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. P_d is based on max. junction temperature, using junction-ambient thermal resistance.
C. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in the still air environment with T_A =25 . The maximum allowed junction temperature of 150 . The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

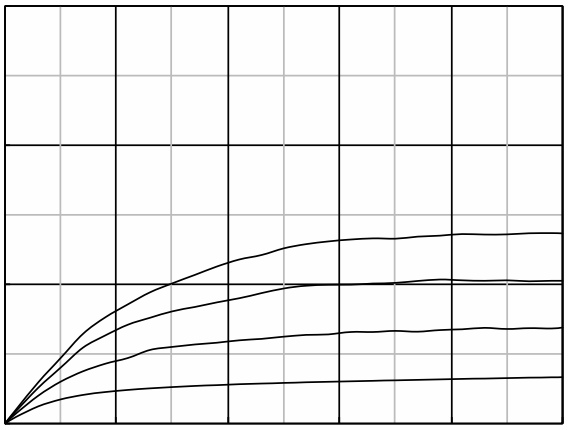


Figure 1. Output Characteristics

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

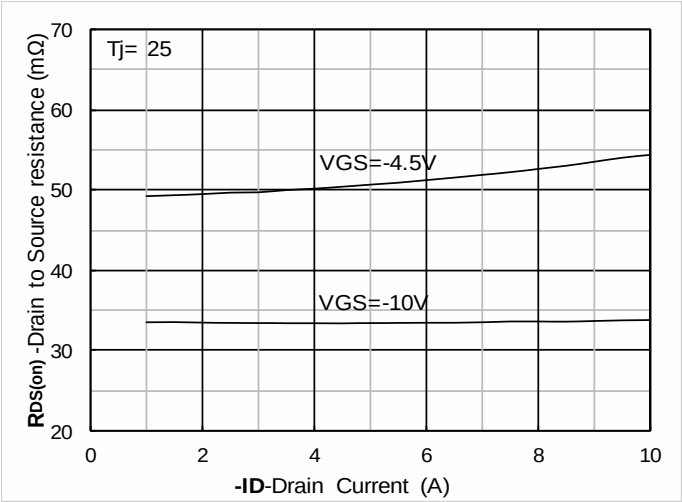


Figure 7. $R_{DS(on)}$ VS Drain Current

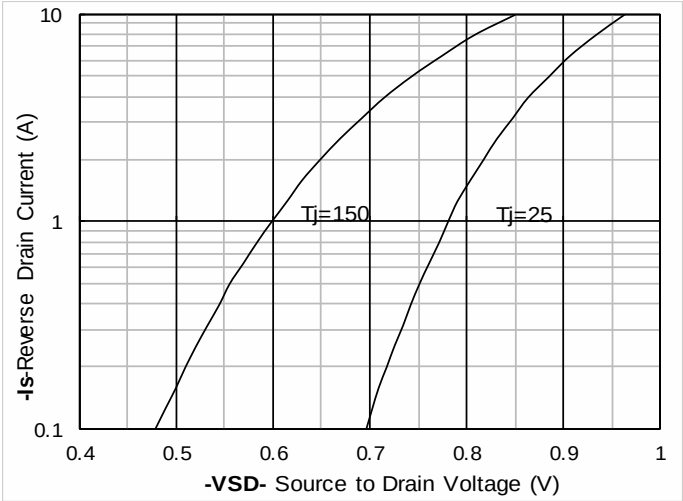


Figure 8. Forward characteristics of reverse diode

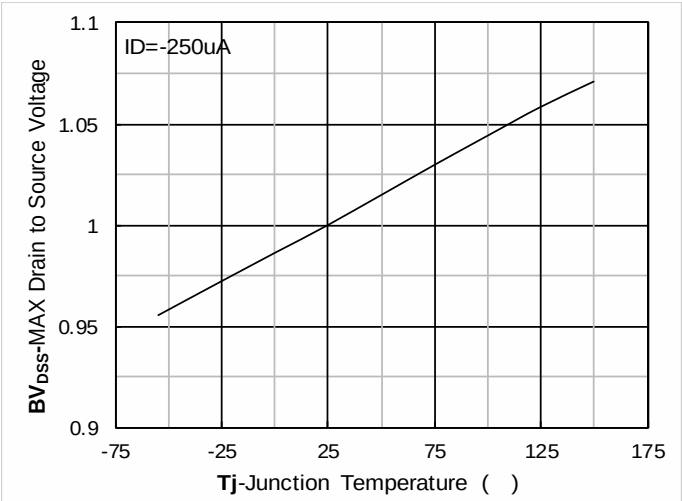


Figure 9. Normalized breakdown voltage

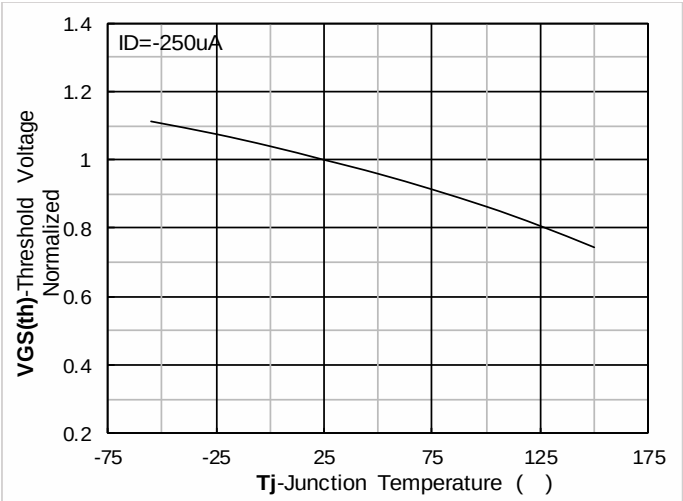


Figure 10. Normalized Threshold voltage

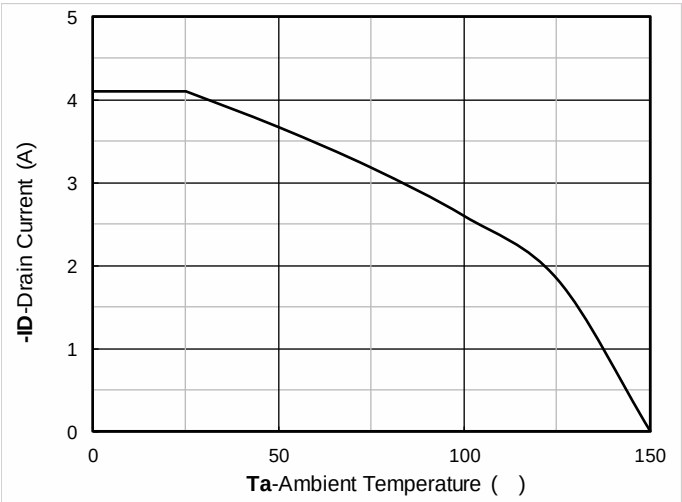


Figure 11. Current dissipation

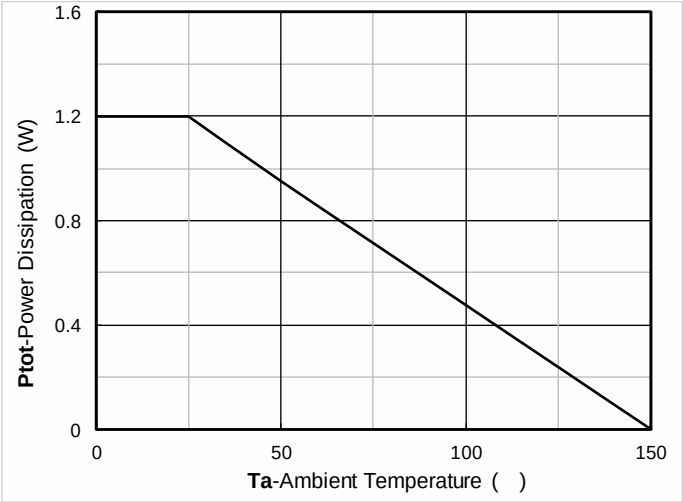
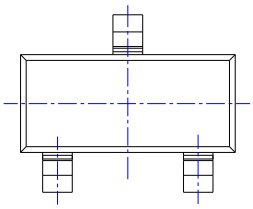
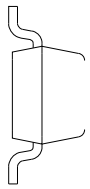


Figure 12. Power dissipation

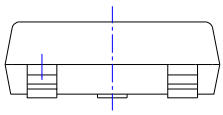
■ SOT-23 Package information



TOP VIEW



SIDE VIEW



UNIT mm

SUGGESTED SOLDER PAD LAYOUT

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