

P - Channel 30V (D-S) MOSFET

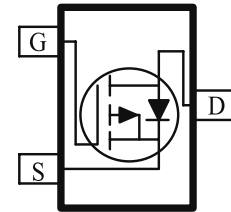
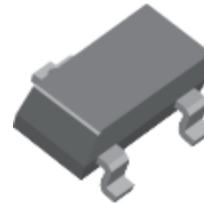
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOT-23 saves board space
- Fast switching speed
- High performance trench technology



ESD Protected
2000V

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.057 @ $V_{GS} = -10$ V	-3.6
	0.089 @ $V_{GS} = -4.5$ V	-2.8



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Ratings	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 25	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	± 3.6	A
	$T_A = 70^\circ\text{C}$		± 2.9	
Pulsed Drain Current ^b		I_{DM}	± 10	
Continuous Source Current (Diode Conduction) ^a		I_S	0.4	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	1.25	W
	$T_A = 70^\circ\text{C}$		0.8	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$t \leq 5$ sec	R_{THJA}	100	$^\circ\text{C/W}$
	Steady-State		150	

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Switch Off Characteristics						
Zero Gate Voltage Drain Current	IDSS	VDS = -24 V, VGS = 0 V			-1	μA
		VDS = -24 V, VGS = 0 V, TJ = 55°C			-10	
Gate-Body Leakage	IGSS	VDS = 0 V, VGS = ±8 V			±100	nA
Gate-Threshold Voltage	VGS(th)	VDS = VGS, ID = -250 uA	-0.80			V
On-State Drain Current ^A	ID(on)	VDS = -5 V, VGS = -4.5 V	-2			A
Drain-Source On-Resistance ^A	rDS(on)	VGS = -10 V, ID = -3.6 A			57	mΩ
		VGS = -4.5 V, ID = -2.8 A			89	
Forward Tranconductance ^A	gfs	VDS = -5 V, ID = -3.6 A		2		S
Diode Forward Voltage	VSD	IS = -0.4 A, VGS = 0 V		-0.70		V
Dynamic ^b						
Total Gate Charge	QG	VDS = -10 V, VGS = -5 V, ID = -3.6 A		6.4		nC
Gate-Source Charge	QGS			1.9		
Gate-Drain Charge	QGD			2.5		
Turn-On Delay Time	td(on)	VDS = -15 V, ID = -1 A, RG = 50 Ω VGEN = -10 V		10		ns
Rise Time	tr			2.8		
Turn-Off Delay Time	td(off)			53.6		
Fall Time	tf			46		

Notes

- Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics (P-Channel)

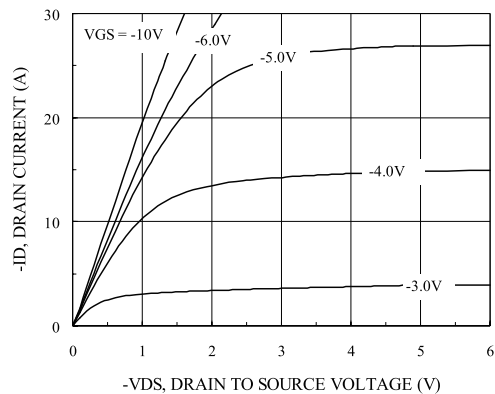


Figure 1. On-Region Characteristics

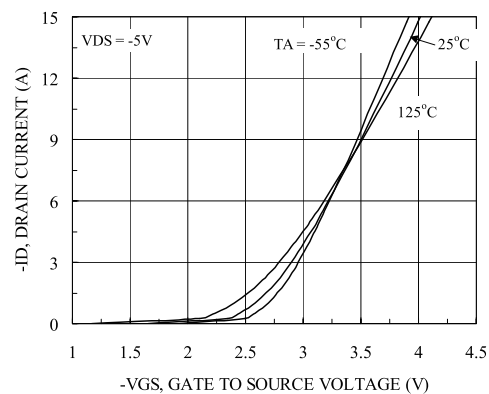


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

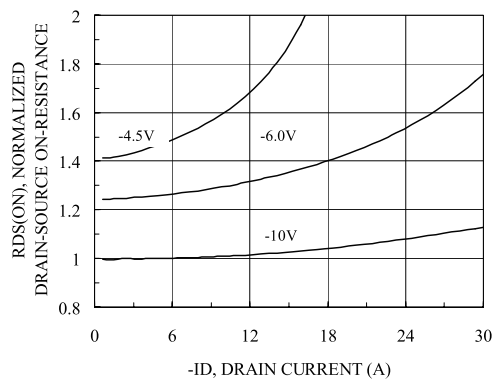


Figure 3. On Resistance Vs Vgs Voltage

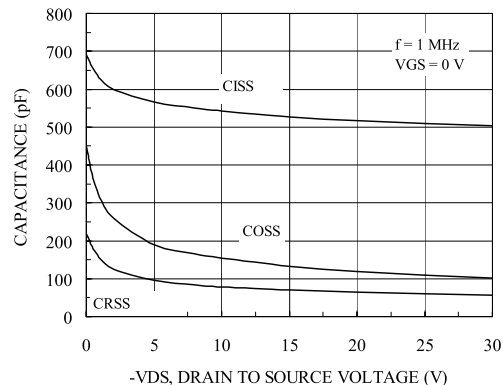


Figure 4. Capacitance Characteristics

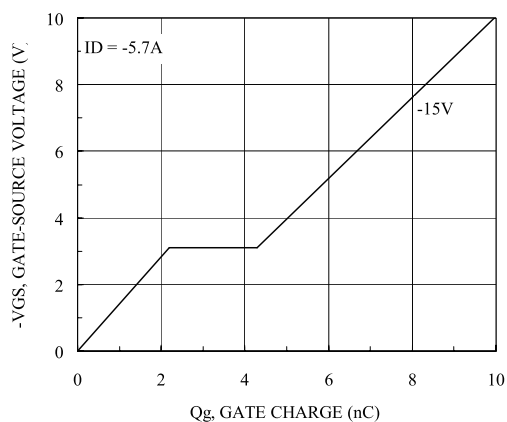


Figure 5. Gate Charge Characteristics

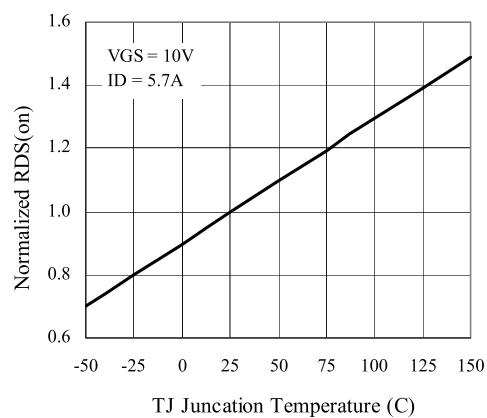


Figure 6. On-Resistance Variation with Temperature

Typical Electrical Characteristics (P-Channel)

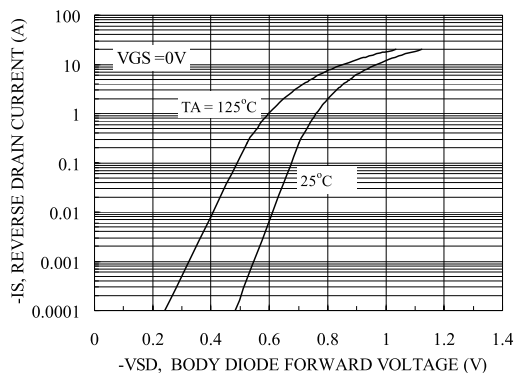


Figure 7. Transfer Characteristics

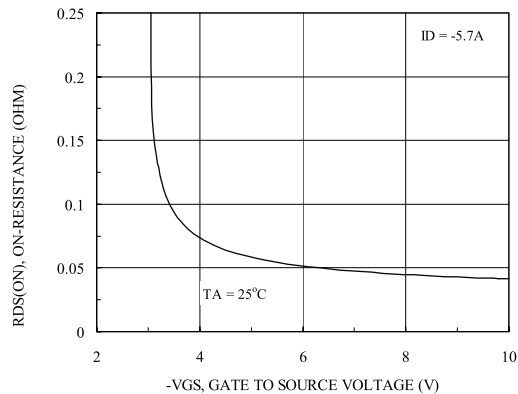


Figure 8. On-Resistance with Gate to Source Voltage

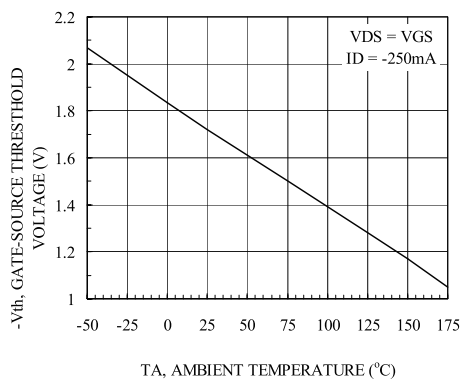


Figure 9. Vth Gate to Source Voltage Vs Temperature

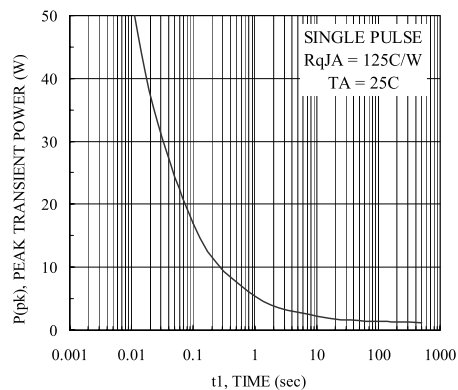


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

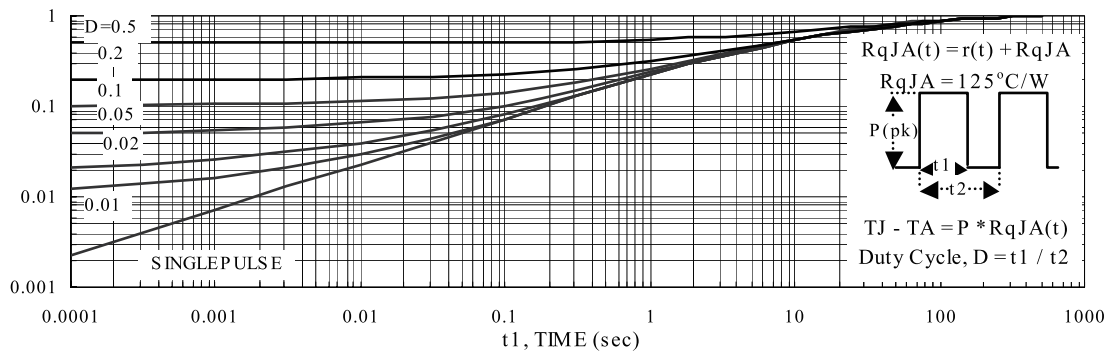
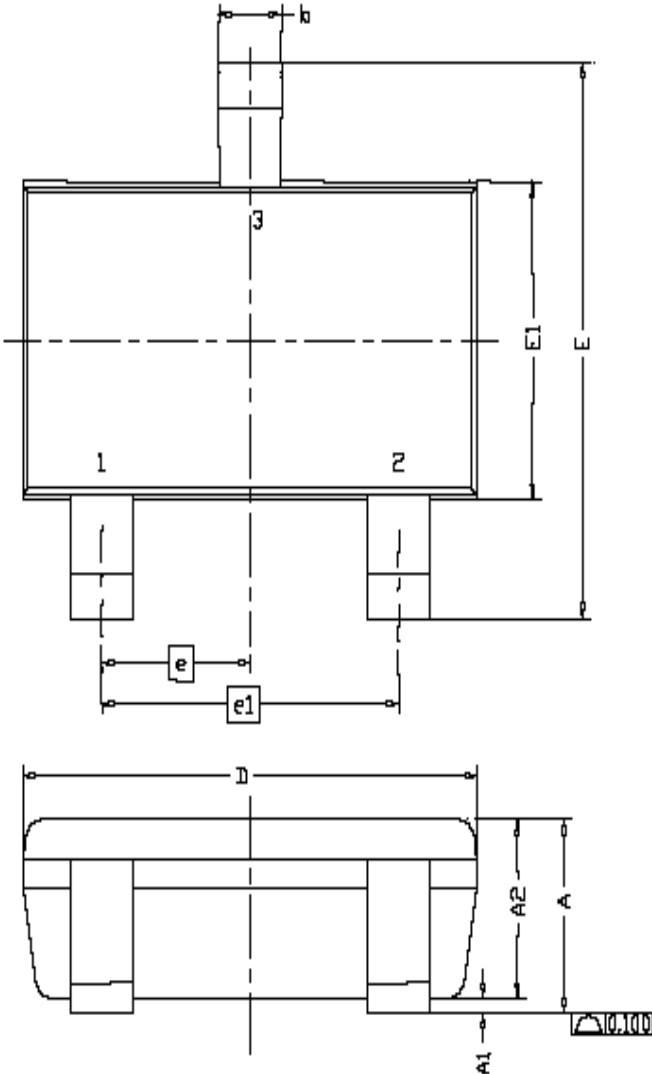


Figure 11. Transient Thermal Response Curve

Package Information



DIM.	MILLIMETERS		
	MIN	NOM	MAX
A	0.935	0.95	1.10
A1	0.01	---	0.10
A2	0.85	0.90	0.925
b	0.30	0.40	0.50
c	0.10	0.15	0.25
D	2.70	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L1	0.60REF		
L2	0.25BSC		
R	0.10	---	---
θ	0°	4°	8°
θ1	7°NOM		

