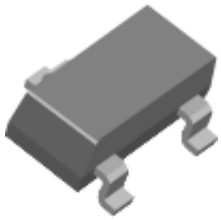
P - Channel Logic Level MOSFET

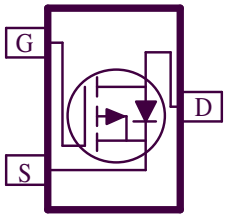
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.30 @ V_{GS} = -10 V	-1.0
	0.50 @ V_{GS} = -4.5V	-0.9

Pb-free
RoHS COMPLIANT
HALOGEN FREE





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current[a]	T_A=25°C	I_D	±0.9	A
	T_A=70°C		±0.75	
Pulsed Drain Current[b]		I_{DM}	±10	
Continuous Source Current (Diode Conduction)[a]		I_S	0.4	A
Power Dissipation[a]	T_A=25°C	P_D	0.5	W
	T_A=70°C		0.42	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient[a]	t <= 5 sec	R_{THJA}	250	°C/W
	Steady-State		285	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

b. Pulse width limited by maximum junction temperature

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Switch Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = -250 uA	-30			
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24 V, V_{GS} = 0 V			-1	µA
		V_{DS} = -24 V, V_{GS} = 0 V, T_J = 55°C			-10	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Switch On Characteristics						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 uA	-0.80	-1.7	-2.6	V
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -4.5 V	-2			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = -10 V, I_D = -1.0 A		0.25	0.30	Ω
		V_{GS} = -4.5 V, I_D = -0.9 A T_J = 55°C		0.53	0.66	
		V_{GS} = -4.5 V, I_D = -0.9 A		0.45	0.50	
Forward Tranconductance[A]	g_{fs}	V_{DS} = -5 V, I_D = -1.1 A		2		S
Diode Forward Voltage	V_{SD}	I_S = -0.4 A, V_{GS} = 0 V		-0.70	-1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -10 V, V_{GS} = -5 V, I_D = -0.9 A		2.0	3.0	nC
Gate-Source Charge	Q_{gs}			0.5		
Gate-Drain Charge	Q_{gd}			1.1		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = -10 V, I_D = -0.9 A, R_G = 50 Ω, V_{GEN} = -10 V		8	16	ns
Rise Time	t_r			16	32	
Turn-Off Delay Time	$t_{d(off)}$			36	93	
Fall-Time	t_f			33	94	

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics

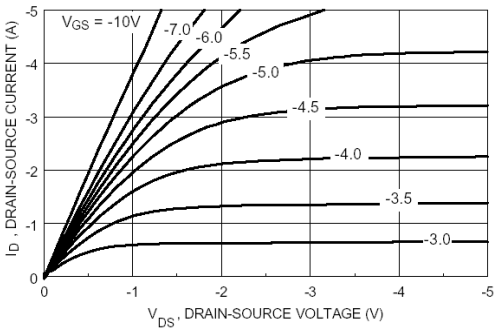


Figure 1. On-Region Characteristics

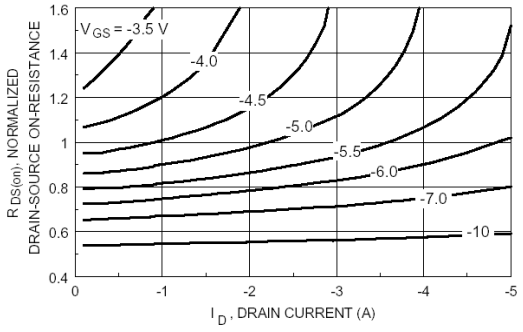


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

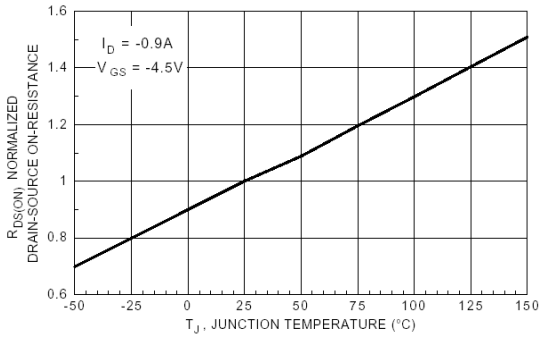


Figure 3. On-Resistance Variation with Temperature

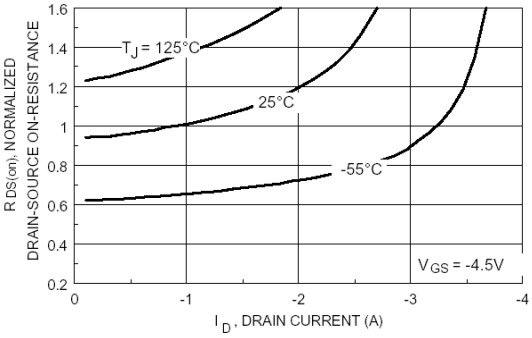


Figure 4. On-Resistance Variation with Gate to Source Voltage

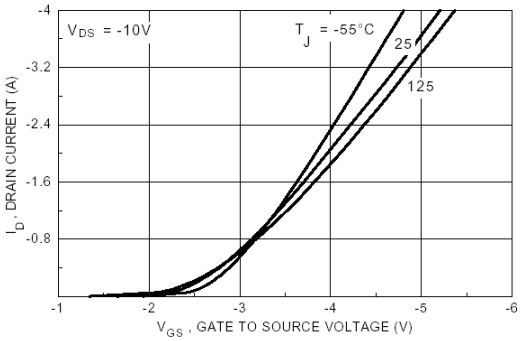


Figure 5. Transfer Characteristics

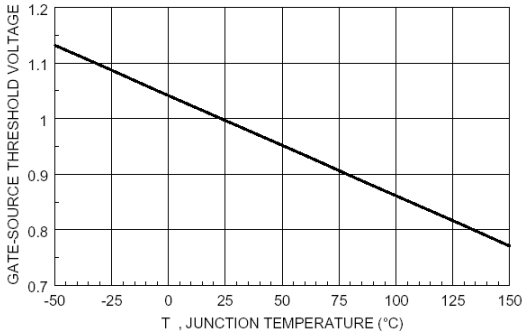


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics

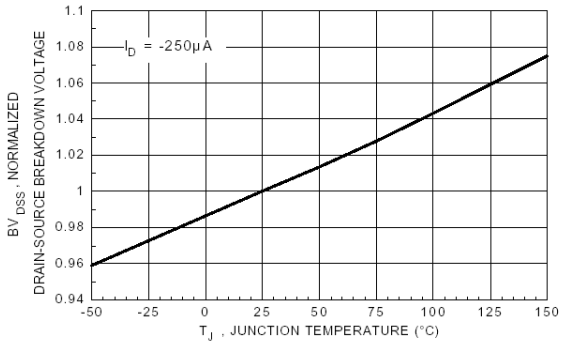


Figure 7. Breakdown Voltage With Temperature

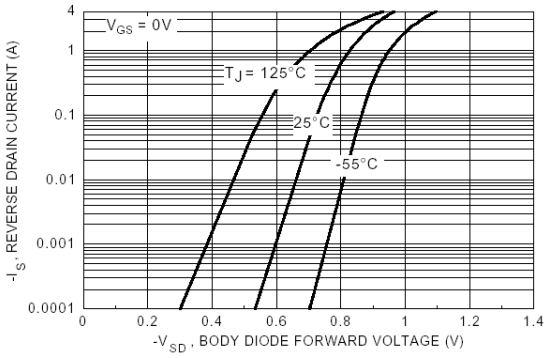


Figure 8. Body Diode Forward Voltage With Source Current & Temperature

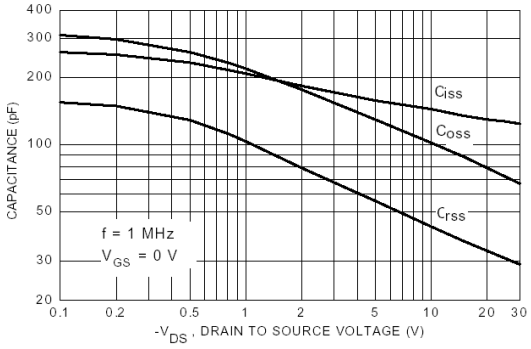


Figure 9. Capacitance Characteristic

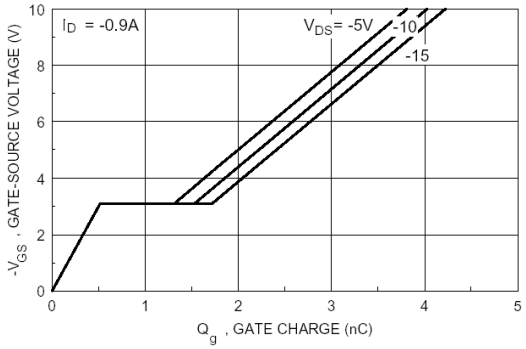


Figure 10. Gate Charge Characteristic

Normalized Thermal Transient Impedance, Junction to Ambient

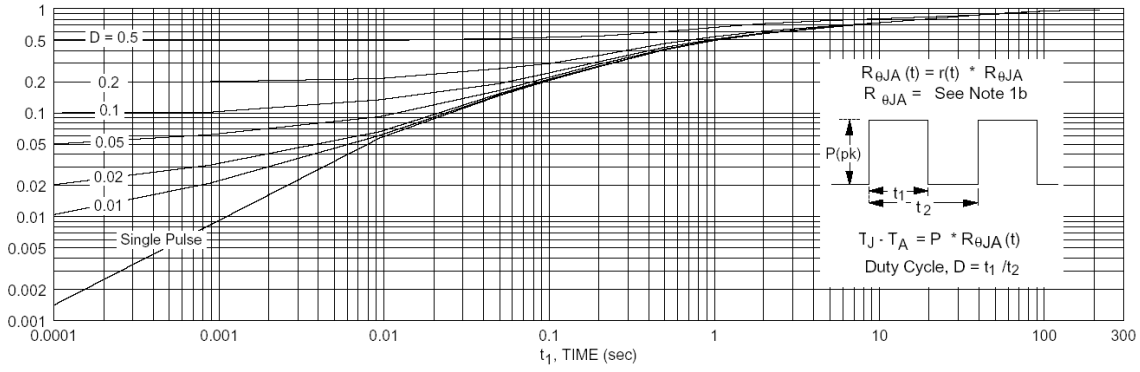


Figure 11. Transient Thermal Response Curve

Typical Electrical Characteristics

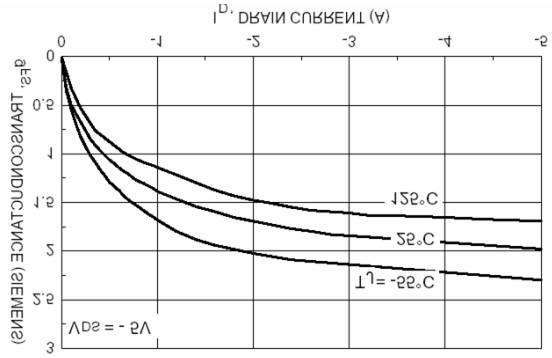


Figure 13. Transconductance Variation With Current & Temperature

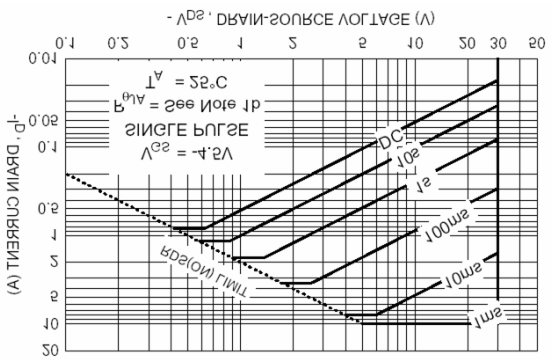


Figure 14. Maximum Safe Operation Area

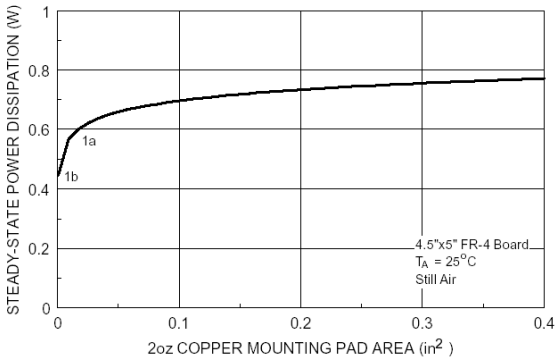


Figure 15. SOT-3 Maximum Steady-State Variation Power Dissipation versus Copper Pad Area

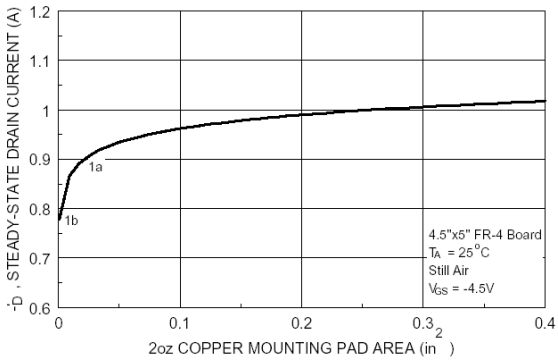
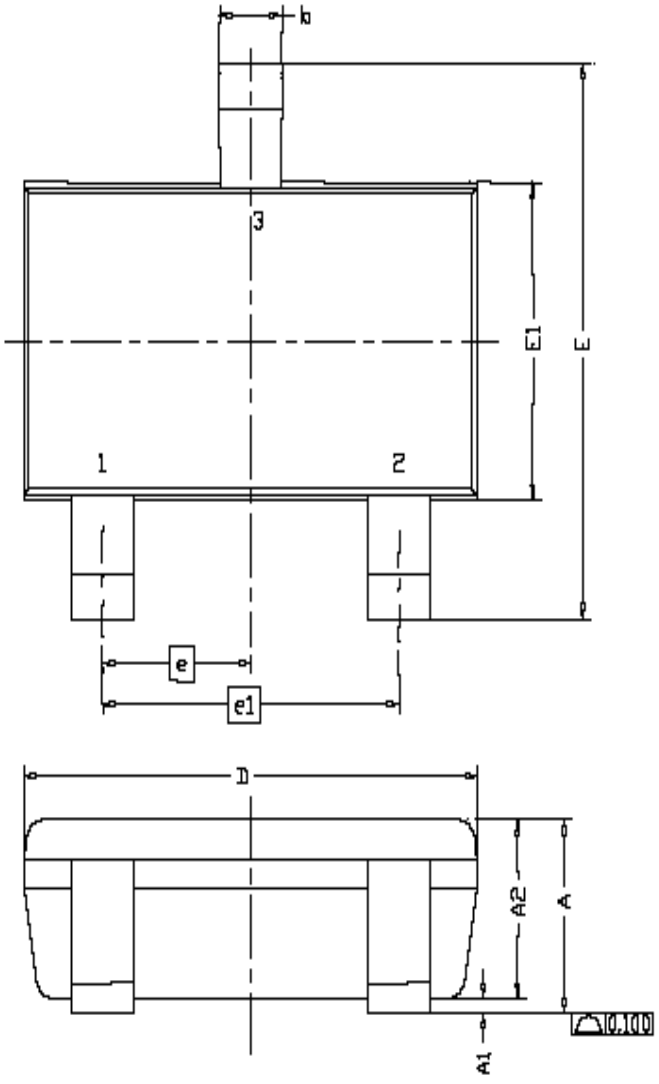


Figure 16. Maximum State-State Drain Current Versus Copper Pad Area

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