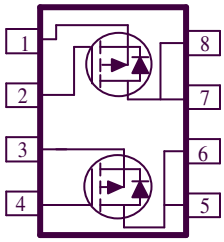
P-Channel 20-V (D-S) MOSFET

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.

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ m(Ω)	I_D (A)
-20	52 @ V_{GS} = -4.5V	-4.9
	89 @ V_{GS} = -2.5V	-4.0
	124 @ Vgs = -1.8V	-3.6

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8 saves board space
- Fast switching speed
- High performance trench technology

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}	-20	V
Gate-Source Voltage		V_{GS}	±12	
Continuous Drain Current[a]	T_A=25°C	I_D	-5.2	A
	T_A=70°C		-4.1	
Pulsed Drain Current[b]		I_{DM}	±50	
Continuous Source Current (Diode Conduction)[a]		I_S	-2.1	A
Power Dissipation[a]	T_A=25°C	P_D	2.1	W
	T_A=70°C		1.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Case[a]	t <= 5 sec	$R_{\theta JC}$	40	°C/W
Maximum Junction-to-Ambient[a]	t <= 5 sec	$R_{\theta JA}$	60	°C/W

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**	
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 uA	-0.7			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16 V, V_{GS} = 0 V			-1	uA
		V_{DS} = -16 V, V_{GS} = 0 V, T_J = 55°C			-5	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = -4.5 V, V_{GS} = -10 V	-20			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -4.9 A			52	mΩ
		V_{GS} = -2.5 V, I_D = -4.0 A			89	
		V_{GS} = -1.8 V, I_D = -3.6 A			124	
Forward Tranconductance[A]	g_{fs}	V_{DS} = -15 V, I_D = -4.9 A		20		S
Diode Forward Voltage	V_{SD}	I_S = 2.5 A, V_{GS} = 0 V		-0.6		V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -4.9 A		16.7		nC
Gate-Source Charge	Q_{gs}			1.8		
Gate-Drain Charge	Q_{gd}			1.9		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -10 V, R_L = 6 Ω , I_D = -1 A, VGEN = -4.5 V		7		nS
Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			14		
Fall-Time	t_f			9		

Notes

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

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

Typical Electrical Characteristics (P-Channel)

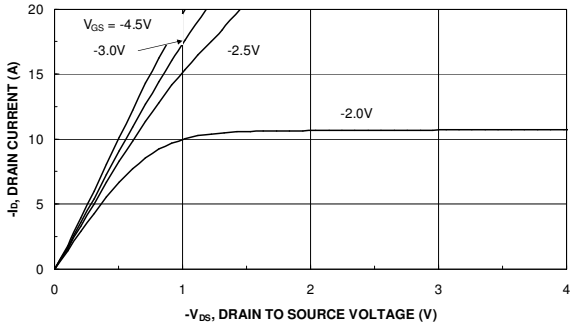


Figure 1. Output Characteristics

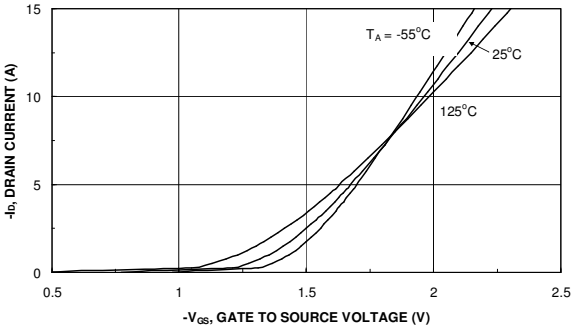


Figure 2. Transfer Characteristics

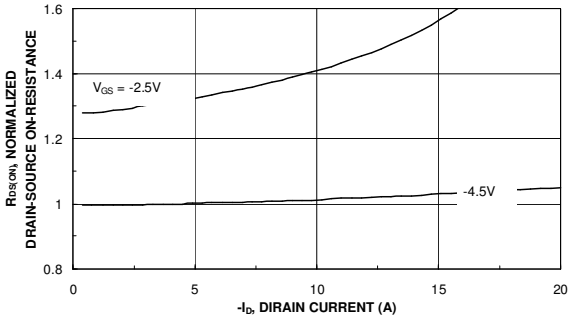


Figure 3. On-Resistance vs. Drain Current

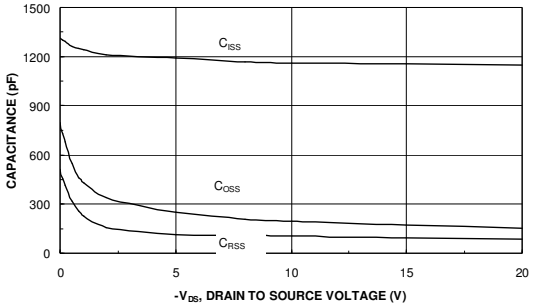


Figure 4. Capacitance

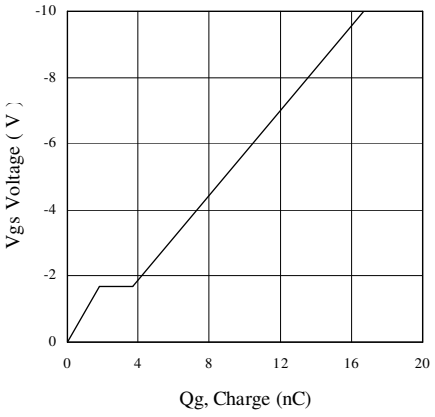


Figure 5. Gate Charge

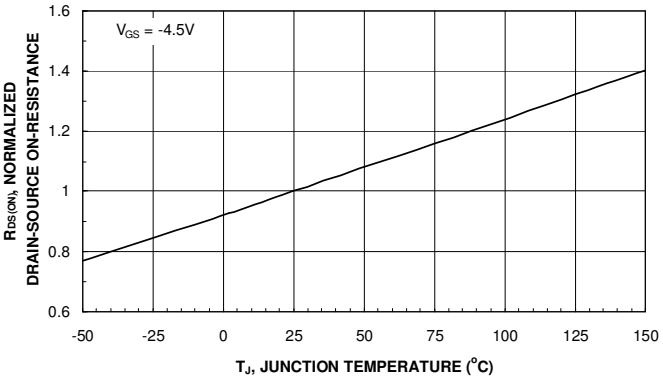


Figure 6. On-Resistance vs. Junction Temperature

Typical Electrical Characteristics (P-Channel)

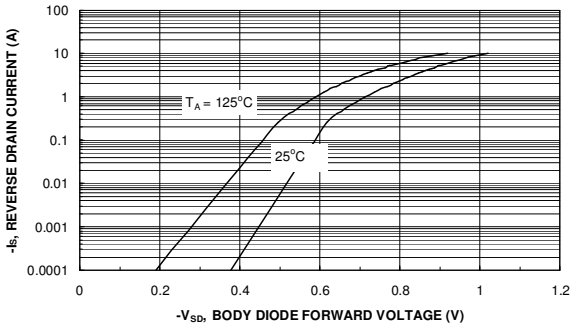


Figure 7. Source-Drain Diode Forward Voltage

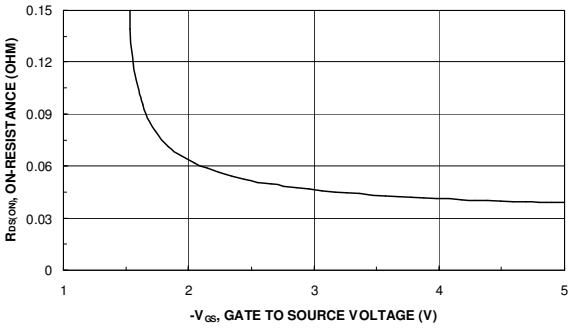


Figure 8. On-Resistance with Gate to Source Voltage

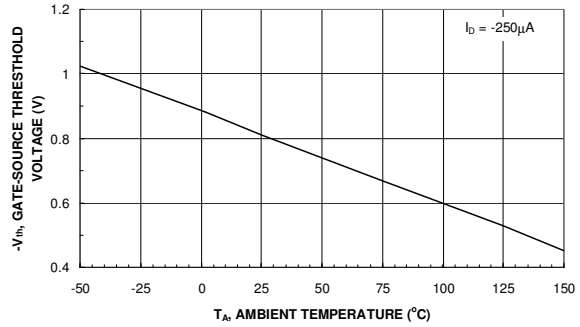


Figure 9. Vth Gate to Source Voltage Vs Temperature

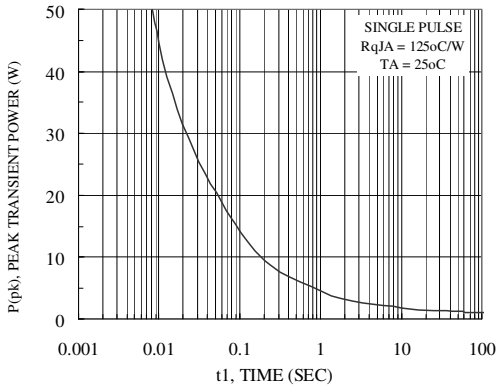


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

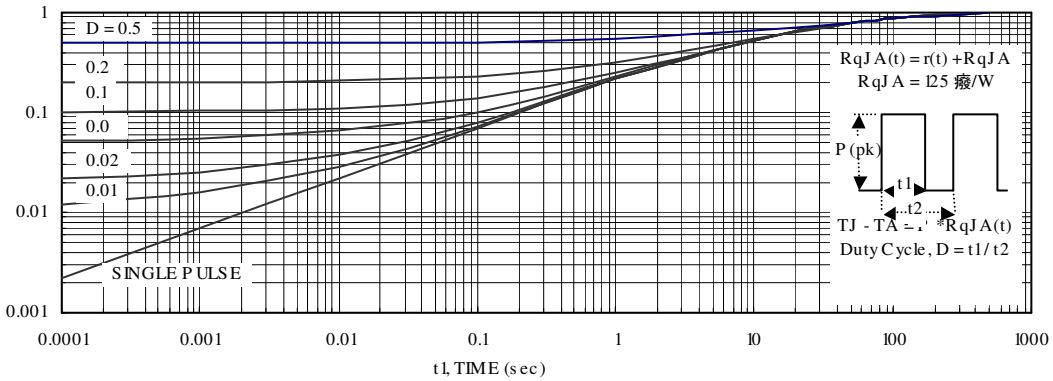
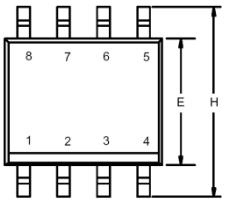
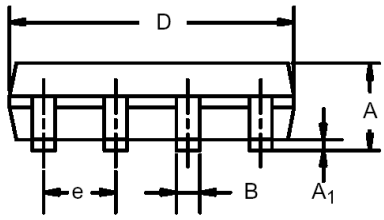


Figure 11. Transient Thermal Response Curve

Package Information

SO-8: 8LEAD





Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°