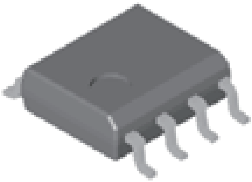
P-Channel 20-V (D-S) MOSFET

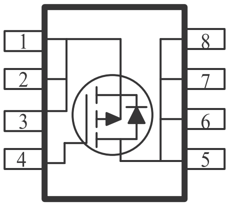
These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature SO-8 Surface Mount Package Sa Board Space
- High power and current handling capability

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ m(Ω)	I_D (A)
-20	13 @ V_{GS} = -4.5V	-11.5
	19 @ V_{GS} = -2.5V	-10
	35 @ V_{GS} = -1.8V	-7.7





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	-13.4	A
	T_A=70°C		-8.4	
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	3.1	W
	T_A=70°C		2.0	
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	$R_{\theta JC}$	25	°C/W
Maximum Junction-to-Ambient[a]	t <= 5 sec	$R_{\theta JA}$	40	°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	-50			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -11.5 A			11.5	mΩ
		V_{GS} = -2.5 V, I_D = -10.4 A			19	
		V_{GS} = -1.8 V, I_D = -7.7 A			35	
Forward Tranconductance[A]	g_{fs}	V_{DS} = -15 V, I_D = -11.5 A		70		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 = -11.5 A		33.4		nC
Gate-Source Charge	Q_{gs}			5.9		
Gate-Drain Charge	Q_{gd}			8.1		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -10 V, R_L = 6 Ω , ID = -1 A, VGEN = -4.5 V		20		nS
Rise Time	t_r			23		
Turn-Off Delay Time	$t_{d(off)}$			289		
Fall-Time	t_f			134		

Notes

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

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

Typical Electrical Characteristics (P-Channel)

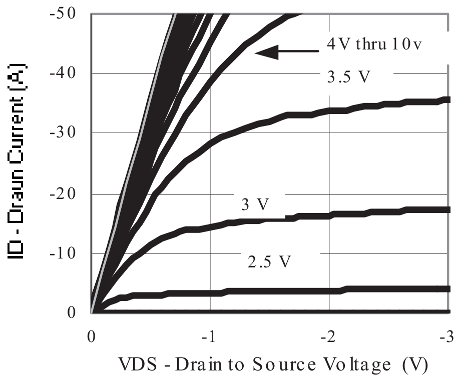


Figure 1. On-Region Characteristics

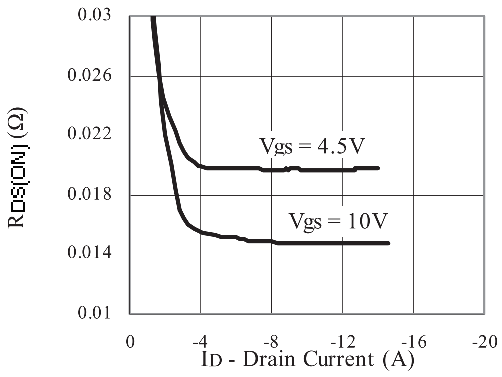


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

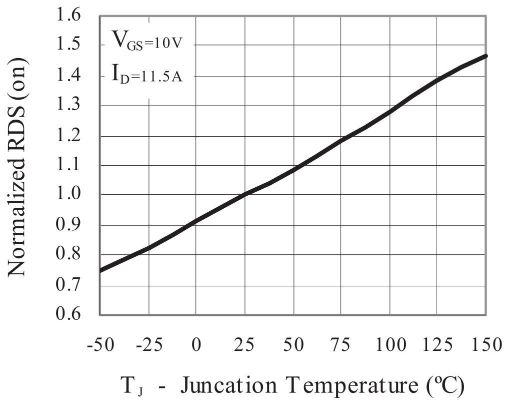


Figure 3. On-Resistance Variation with Temperature

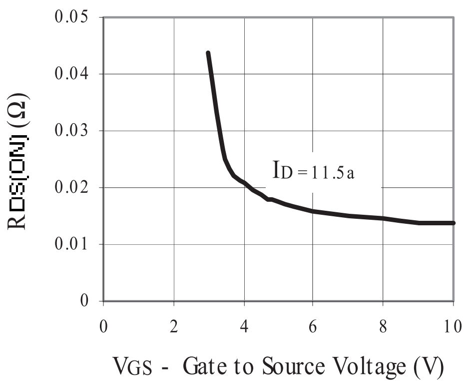


Figure 4. On-Resistance with Gate to Source Voltage

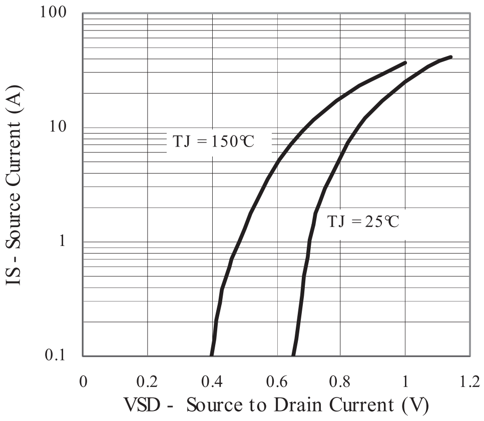


Figure 5. Transfer Characteristics

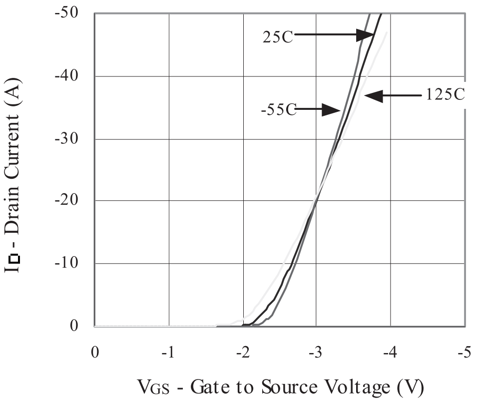


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics (P-Channel)

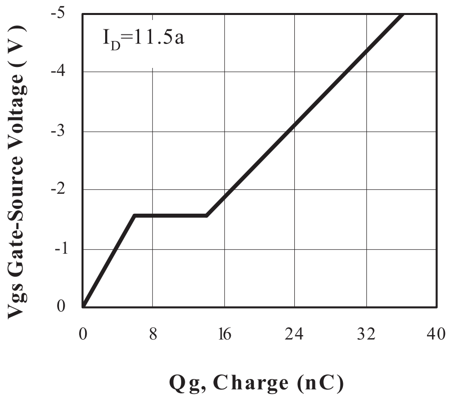


Figure 7. Gate Charge Characteristics

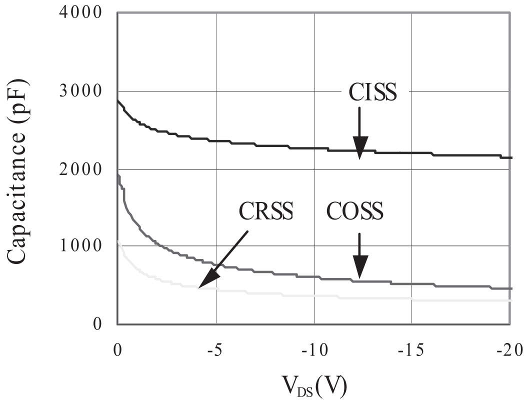


Figure 8. Capacitance Characteristics

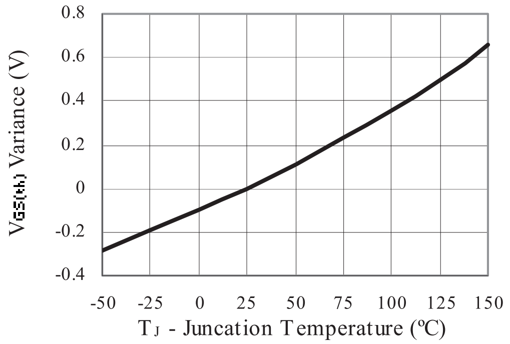


Figure 9. Maximum Safe Operating Area

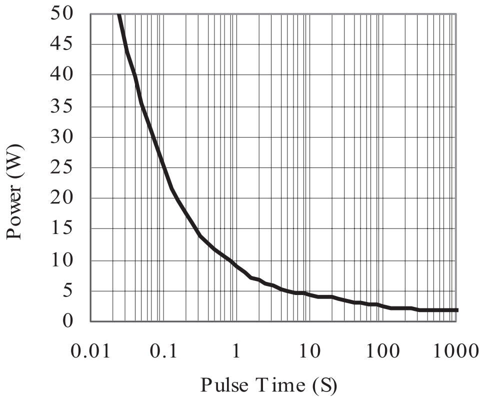


Figure 10. Single Pulse Maximum Power Dissipation

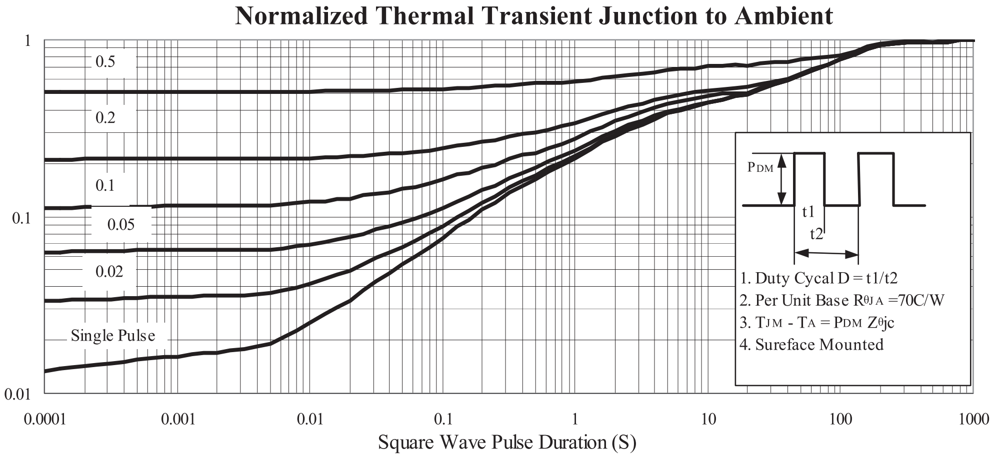
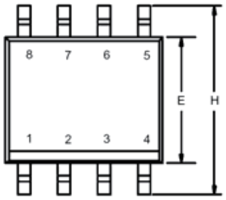
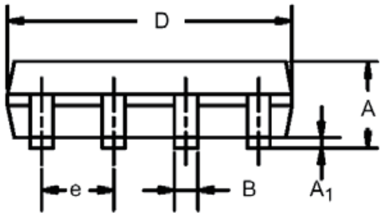


Figure 11. Transient Thermal Response Curve

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°