P-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 100	0.18 at V_{GS} = - 10 V	- 3	7.9
	0.2 at V_{GS} = - 4.5 V	-2.8	

FEATURES

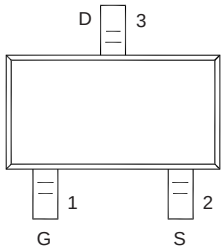
- DT-Trench Power MOSFET
- Ultra Low On-Resistance

Pb-free
RoHS COMPLIANT

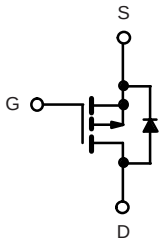
APPLICATIONS

- Active Clamp Circuits in DC/DC Power Supplies

(SOT-23-3L)



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**5 s**	**Steady State**	**Unit**
Drain-Source Voltage		V_{DS}	- 100		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 150 °C)[a, b]	T_A = 25 °C	I_D	- 3.8	- 3	A
	T_A = 70 °C		- 2.5	- 2.8	
Pulsed Drain Current		I_{DM}	- 10.6		
Continuous Source Current (Diode Conduction)[a, b]		I_S	- 5	- 6.8	
Single Pulse Avalanche Current	L = 1.0 mH	I_{AS}	4.5		
Single Pulse Avalanche Energy		E_{AS}	1.01		mJ
Maximum Power Dissipation[a, b]	T_A = 25 °C	P_D	1.25	0.75	W
	T_A = 70 °C		0.8	0.48	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 5 s	R_{thJA}	75	100	°C/W
	Steady State		120	166	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40	50	

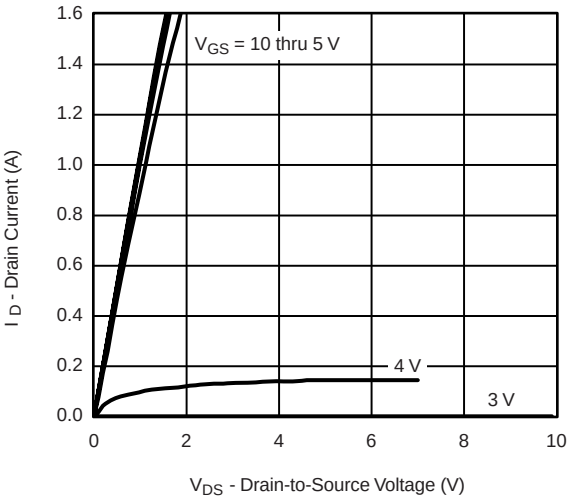
Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. Pulse width limited by maximum junction temperature.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = - 250 µA	- 100			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.2		- 2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 150 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 150 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 15 V, V_{GS} = 10 V	- 2.6			A
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 0.5 A		0.18		Ω
		V_{GS} = - 4.5 V, I_D = - 0.5 A		0.2		
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 0.5 A		2.2		S
Diode Forward Voltage	V_{SD}	I_S = - 1.0 A, V_{GS} = 0 V		0.7	- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 75 V, V_{GS} = 10 V, $I_D \cong$ - 0.5 A		7.7	12	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			2.5		
Gate Resistance	R_g	f = 1.0 MHz		9		Ω
Input Capacitance	C_{iss}	V_{DS} = - 25 V, V_{GS} = 0 V, f = 1 MHz		340	510	pF
Output Capacitance	C_{oss}			30		
Reverse Transfer Capacitance	C_{rss}			16		
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = - 75 V, R_L = 75 Ω, $I_D \cong$ - 1.0 A, V_{GEN} = - 10 V, R_g = 6 Ω		7	11	ns
	t_r			11	17	
Turn-Off Time	$t_{d(off)}$			16	25	
	t_f			11	17	
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = 0.5 A, dI/dt = 100 A/µs		90	135	nC

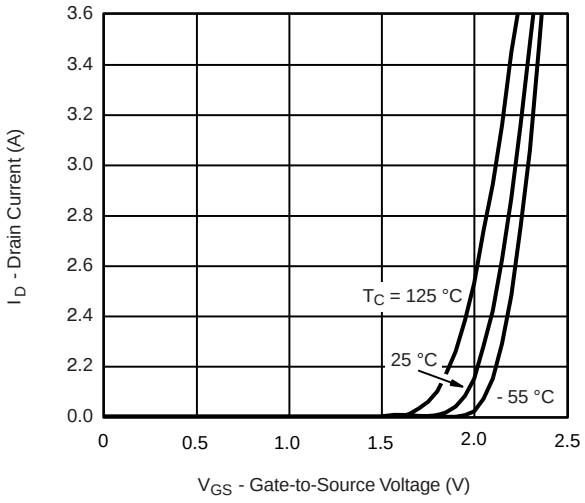
Notes:
a. Pulse test: PW ≤ 300 µs duty cycle ≤ 2 %.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

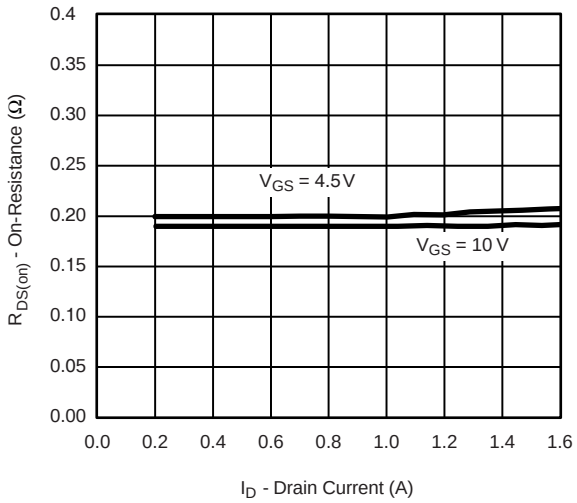
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



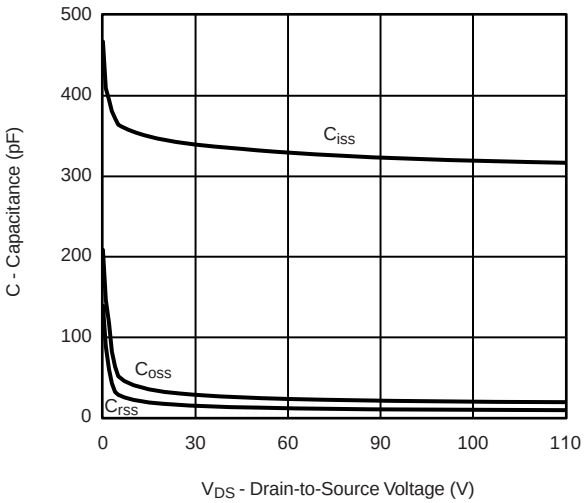
Output Characteristics



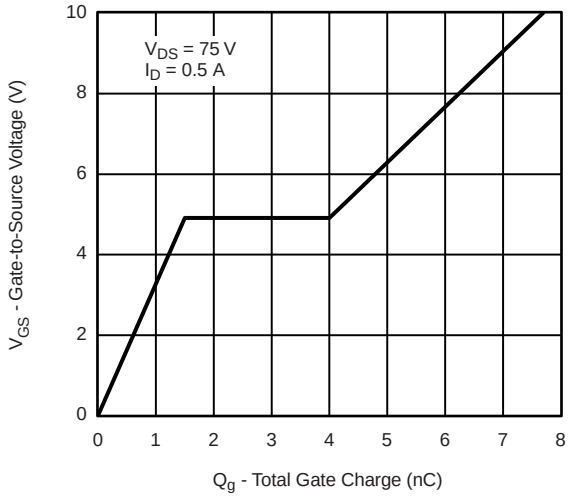
Transfer Characteristics



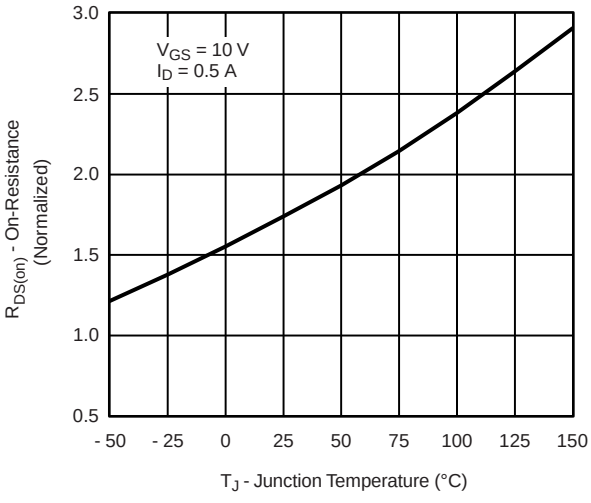
On-Resistance vs. Drain Current



Capacitance

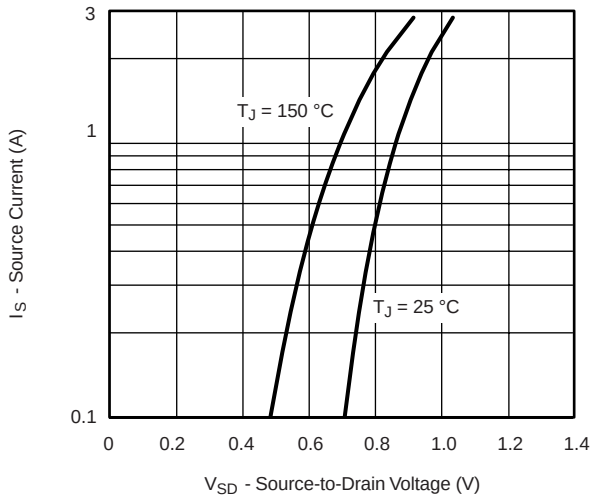


Gate Charge

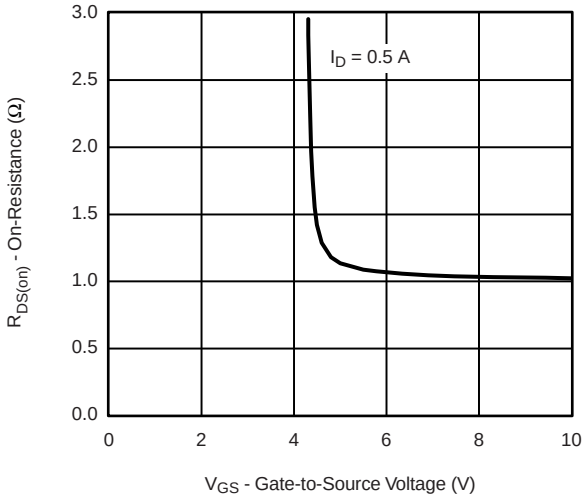


On-Resistance vs. Junction Temperature

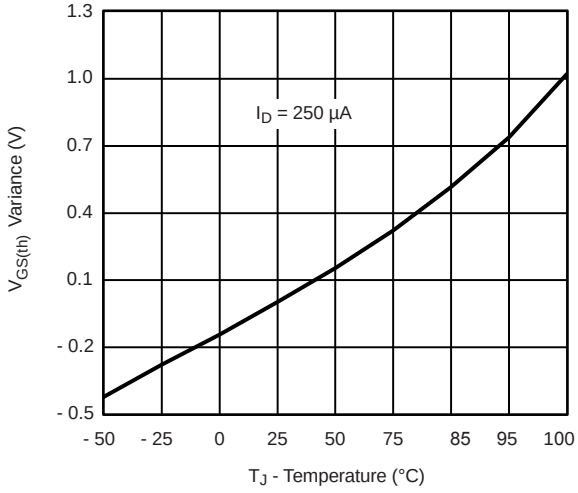
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



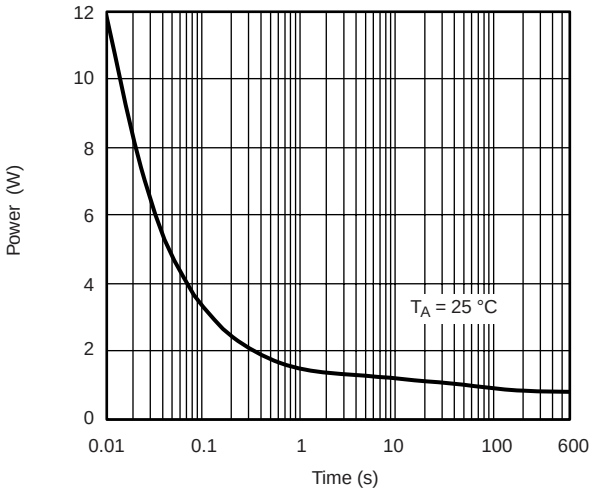
Source-Drain Diode Forward Voltage



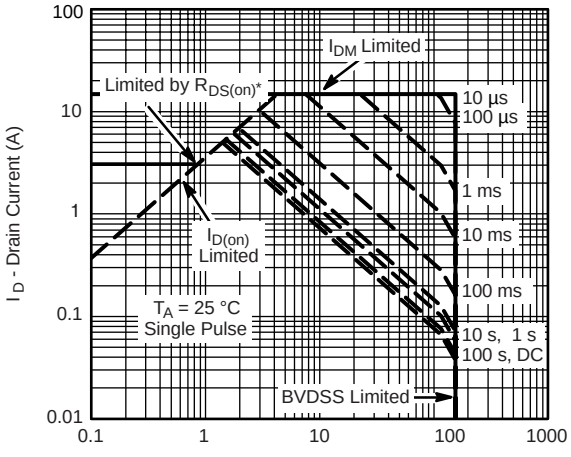
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



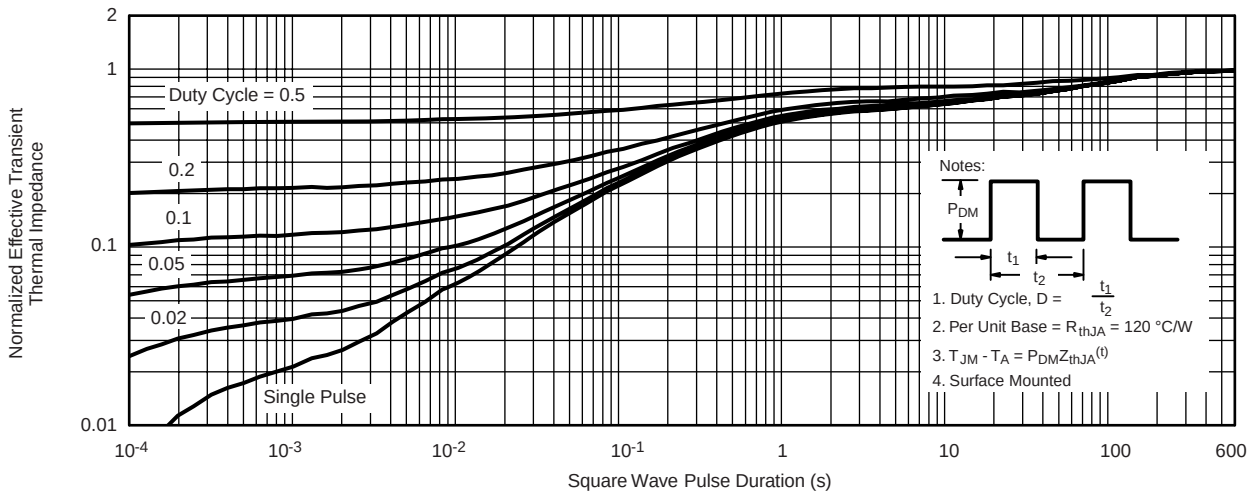
Single Pulse Power



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

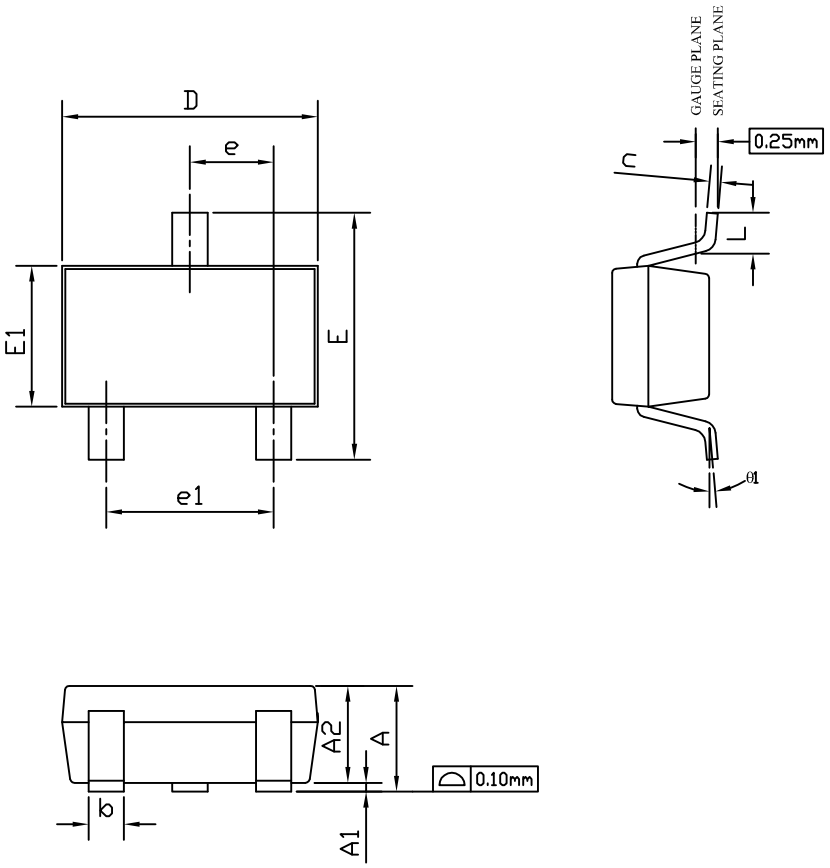
Safe Operating Area

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)

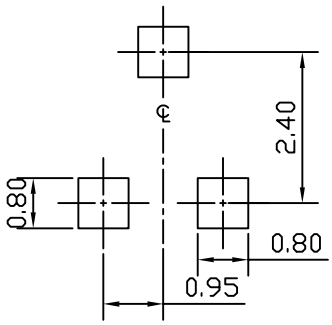


Normalized Thermal Transient Impedance, Junction-to-Ambient

SOT-23-3L PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	——	1.25	0.033	——	0.049
A1	0.00	——	0.13	0.000	——	0.005
A2	0.70	1.00	1.15	0.028	0.039	0.045
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.08	0.13	0.20	0.003	0.005	0.008
D	2.80	2.90	3.10	0.110	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.30	——	0.60	0.012	——	0.024
θ1	0°	5°	8°	0°	5°	8°

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH OR GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 5 MILS EACH.
2. TOLERANCE ±0.100 mm (4 mil) UNLESS OTHERWISE SPECIFIED.
3. DIMENSION L IS MEASURED IN GAUGE PLANE.
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS
   ARE NOT NECESSARILY EXACT.
5. ALL DIMENSIONS ARE IN MILLIMETERS.

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