

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
100	0.084 at V _{GS} = 10 V	6
	0.095 at V _{GS} = 4.5 V	4.5

FEATURES

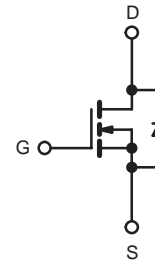
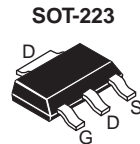
- DT-Trench Power MOSFET
- 100% R_g and UIS Tested

APPLICATIONS

- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications



RoHS
COMPLIANT



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted					
Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V _{DS}	100		V	
Gate-Source Voltage	V _{GS}	± 20			
Continuous Drain Current (T _J = 175 °C) ^a	I _D	T _A = 25 °C	6.0	4.0	A
		T _A = 70 °C	3.6	3.1	
Pulsed Drain Current	I _{DM}	24			
Avalanche Current	I _{AS}	18			
Single Pulse Avalanche Energy	E _{AS}	21		mJ	
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	4.0	1.9	W
		T _A = 70 °C	2.6	1.5	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 175		°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 s	36	45	°C/W
		Steady State	75	90	
Maximum Junction-to-Foot (Drain)	R _{thJF}	17	20		

Notes:

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

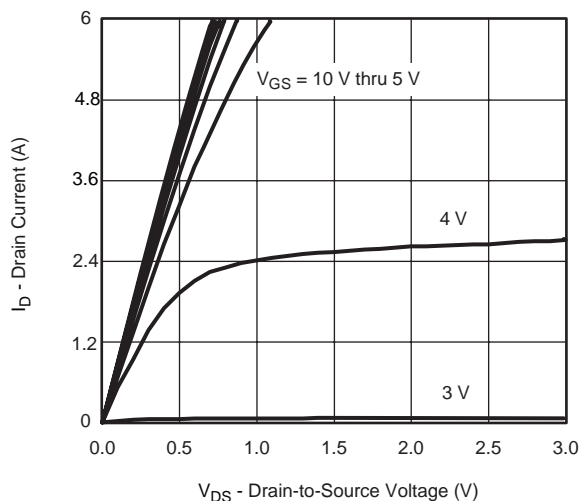
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			20	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}$		0.084	0.093	Ω
		$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}, T_J = 125\text{ }^\circ\text{C}$		0.090	0.096	
		$V_{GS} = 10\text{ V}, I_D = 2.0\text{ A}, T_J = 175\text{ }^\circ\text{C}$		0.105	0.120	
		$V_{GS} = 4.5\text{ V}, I_D = 2.0\text{ A}$		0.095	0.110	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 80\text{ V}, I_D = 3.0\text{ A}$		17		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.0\text{ A}, V_{GS} = 0\text{ V}$		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 80\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}$		18		nC
Gate-Source Charge	Q_{gs}			5.4		
Gate-Drain Charge	Q_{gd}			2.3		
Gate Resistance	R_g	$V_{GS} = 0.1\text{ V}, f = 5\text{ MHz}$		2.4		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 80\text{ V}, R_L = 30\text{ }\Omega$ $I_D \cong 3\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$		7		ns
Rise Time	t_r			4		
Turn-Off Delay Time	$t_{d(off)}$			25		
Fall Time	t_f			5		
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.5\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		40		

Notes:

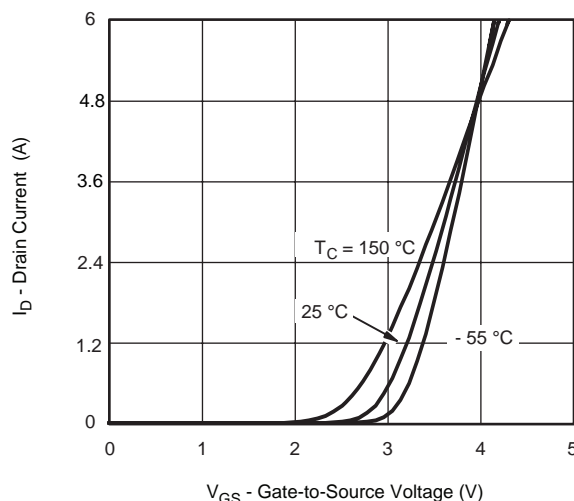
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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 $25\text{ }^\circ\text{C}$, unless otherwise noted

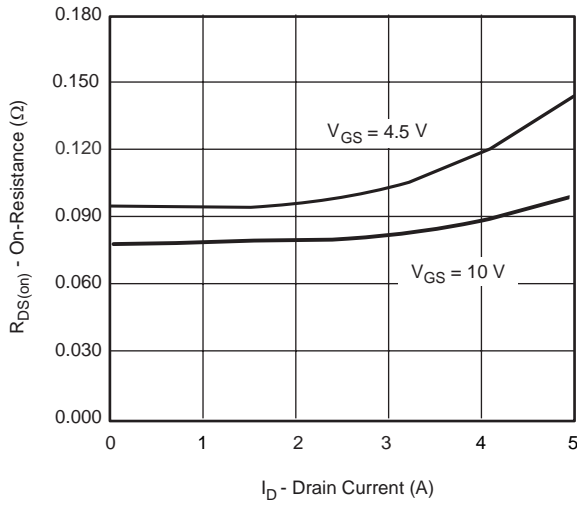


Output Characteristics

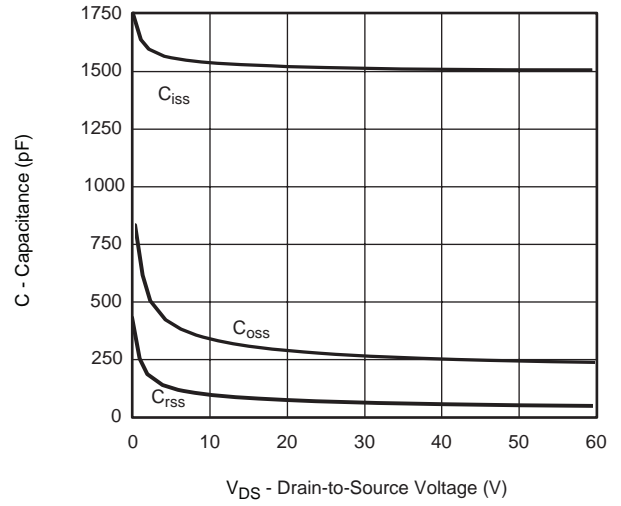


Transfer Characteristics

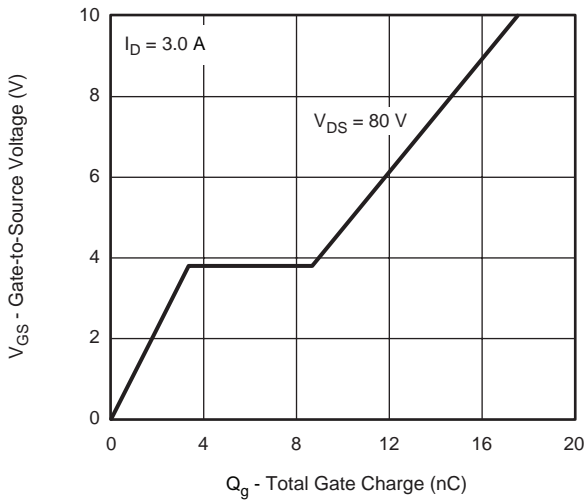
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



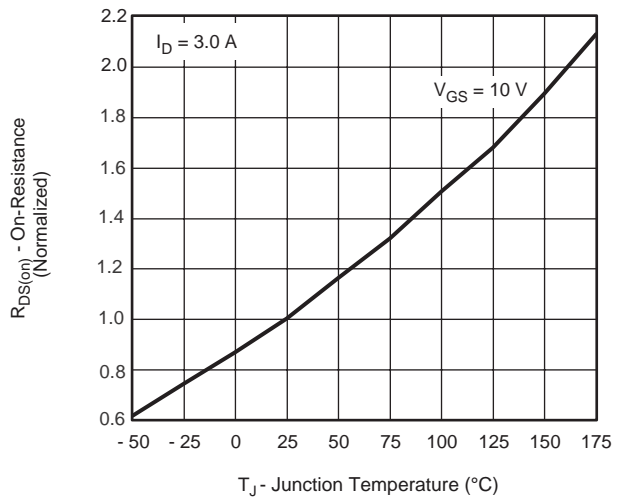
On-Resistance vs. Drain Current



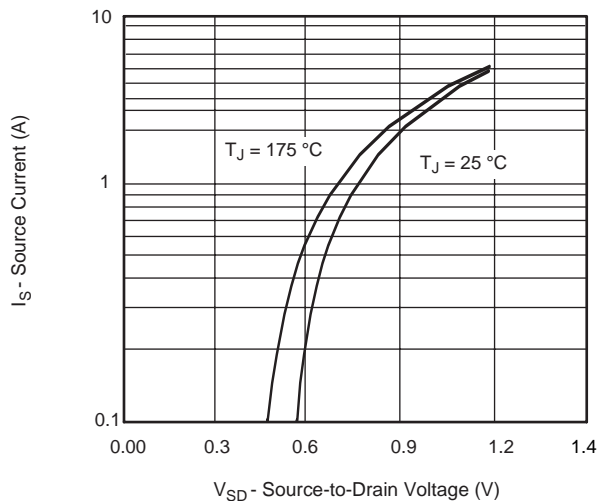
Capacitance



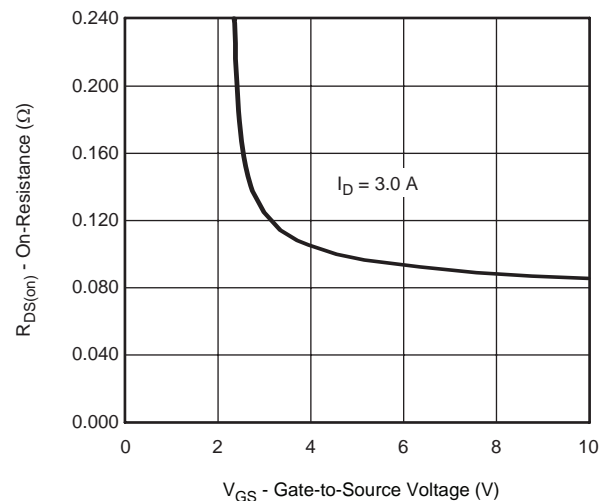
Gate Charge



On-Resistance vs. Junction Temperature

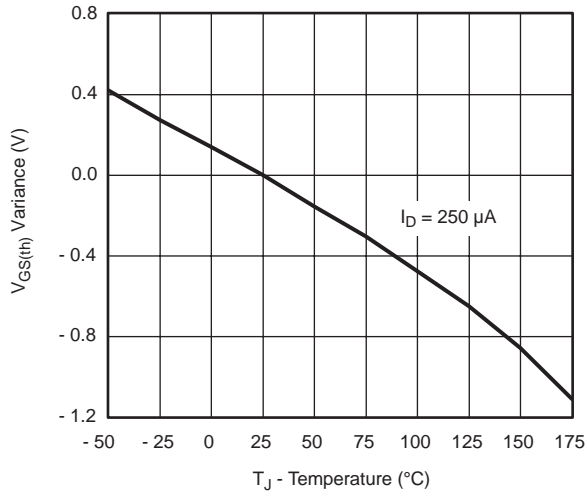


Source-Drain Diode Forward Voltage

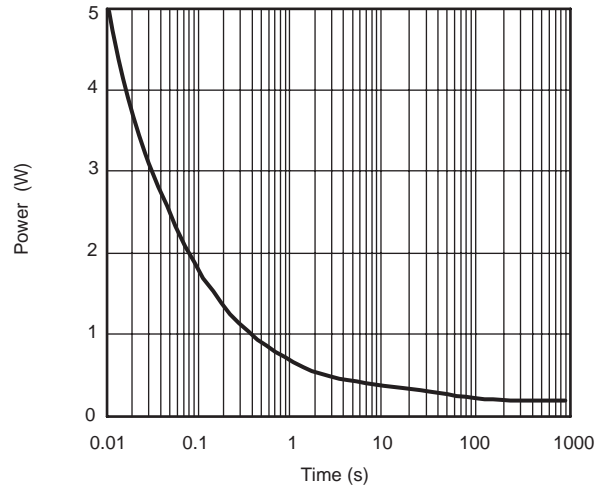


On-Resistance vs. Gate-to-Source Voltage

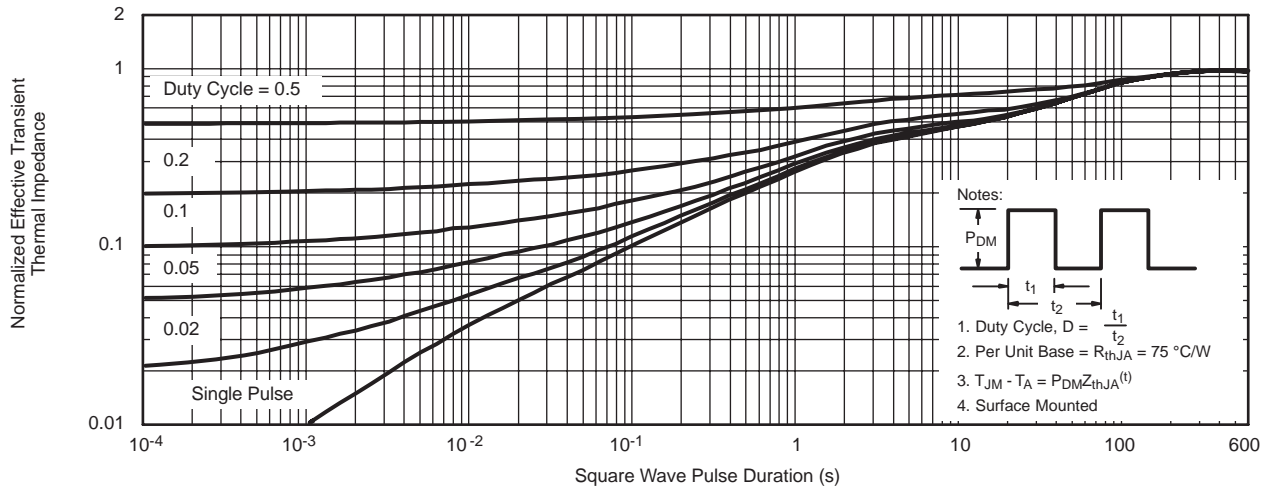
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



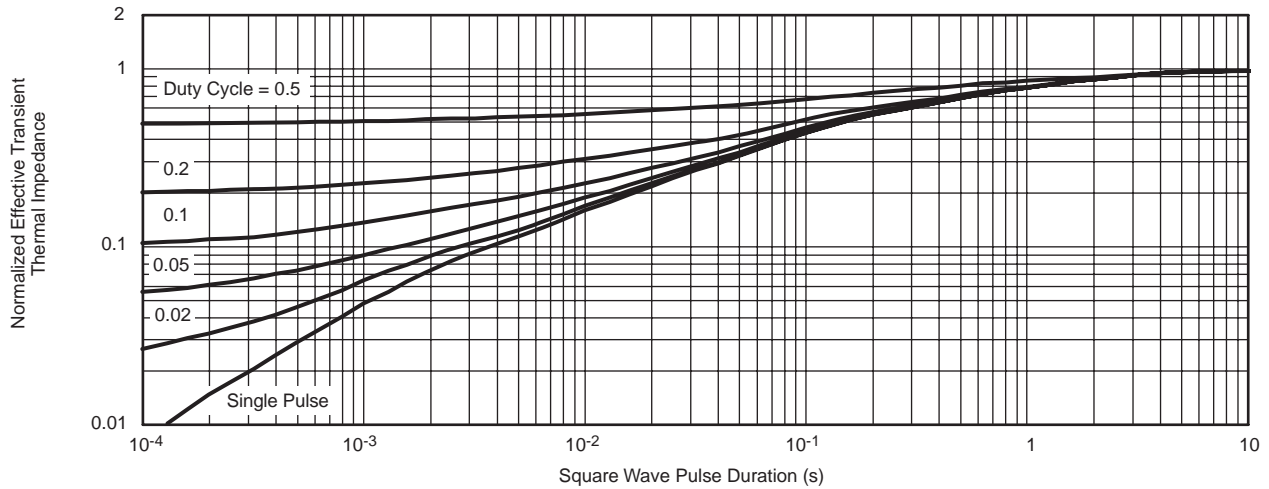
Threshold Voltage



Single Pulse Power

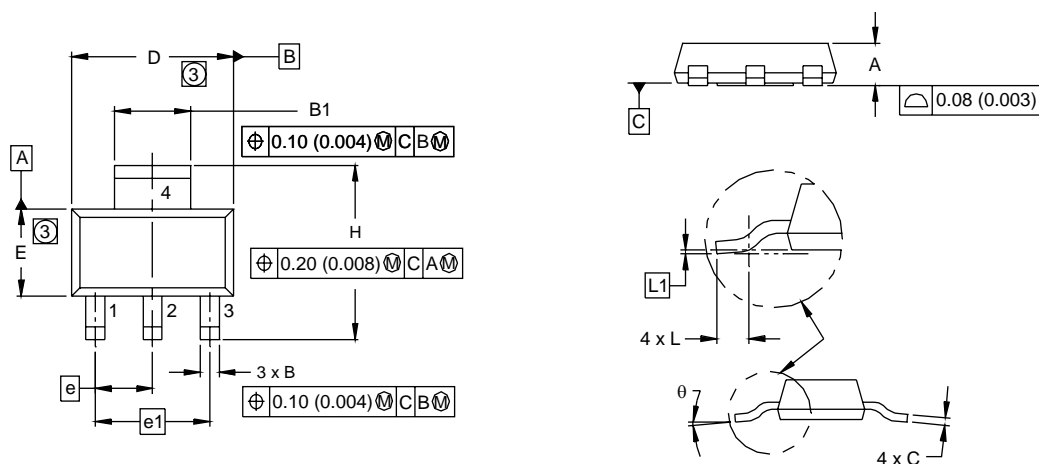


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

SOT-223 (HIGH VOLTAGE)



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.55	1.80	0.061	0.071
B	0.65	0.85	0.026	0.033
B1	2.95	3.15	0.116	0.124
C	0.25	0.35	0.010	0.014
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
e	2.30 BSC		0.0905 BSC	
e1	4.60 BSC		0.181 BSC	
H	6.71	7.29	0.264	0.287
L	0.91	-	0.036	-
L1	0.061 BSC		0.0024 BSC	
θ	-	10'	-	10'

ECN: S-82109-Rev. A, 15-Sep-08
DWG: 5969

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-1994.
2. Dimensions are shown in millimeters (inches).
3. Dimension do not include mold flash.
4. Outline conforms to JEDEC outline TO-261AA.

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