

N-Channel 150 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
150	0.580 at V _{GS} = 10 V	0.9	6.5
	0.815 at V _{GS} = 4.5 V	0.7	

FEATURES

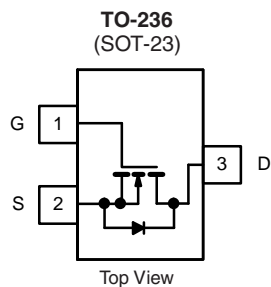
- DT-Trench Power MOSFET
- Small Size
- 100% R_g and UIS Tested



RoHS
COMPLIANT

APPLICATIONS

- Active Clamp Circuits in DC/DC Power Supplies



ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	150	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	A	
		T _C = 70 °C		0.8
Pulsed Drain Current (t = 300 μs)	I _{DM}	3.5	A	
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		0.9
		T _A = 25 °C		0.7 ^{b, c}
Single Pulse Avalanche Current	I _{AS}	0.8	mJ	
Single Pulse Avalanche Energy	E _{AS}	1.05		
Maximum Power Dissipation	P _D	T _C = 25 °C	0.7	
		T _C = 70 °C	0.4	
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}	80	100	°C/W
	Steady State		125	166	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	42	50	

Notes:

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

b. Pulse width limited by maximum junction temperature.

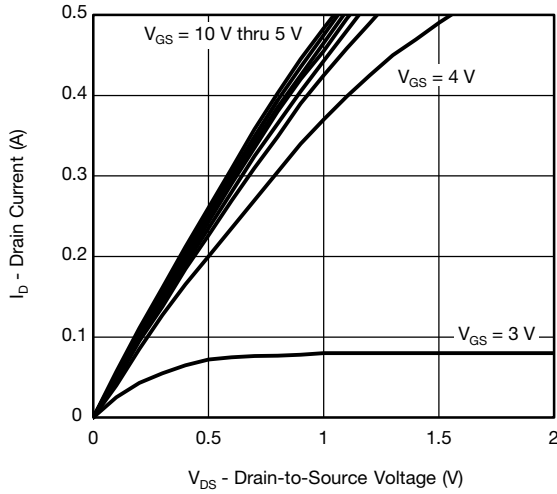
MOSFET SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	150			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2		4	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 4.5\text{ V}$	0.9			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$		0.580	0.690	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 0.5\text{ A}$		0.815	1.150	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 20\text{ V}, I_D = 0.8\text{ A}$		2.0		S
Diode Forward Voltage	V_{SD}	$I_S = 0.9\text{ A}, V_{GS} = 0\text{ V}$		0.8	1.2	V
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		190		μF
Output Capacitance	C_{oss}			22		
Reverse Transfer Capacitance	C_{rss}			11		
Total Gate Charge	Q_g	$V_{DS} = 120\text{ V}, V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$		5.2	10.4	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = 120\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.5\text{ A}$		2.9	5.8	
Gate-Drain Charge	Q_{gd}			1.75		
Gate Resistance	R_g	$f = 1\text{ MHz}$		6.0		Ω
Switching^c						
Turn-On Time	$t_{d(on)}$	$V_{DD} = 120\text{ V}, R_L = 39\text{ }\Omega$ $I_D = 0.5\text{ A}, V_{GEN} = 10\text{ V}$ $R_g = 6\text{ }\Omega$		30	45	ns
	t_r			26	39	
Turn-Off Time	$t_{d(off)}$			17	26	
	t_f			12	20	
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 0.5\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		93	143	nC

Notes:

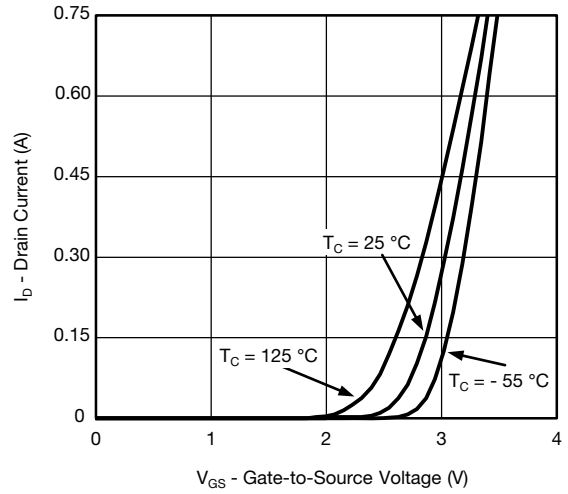
- a. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
 b. For DESIGN AID ONLY, not subject to production testing.
 c. Switching time is essentially independent of operating temperature.

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.

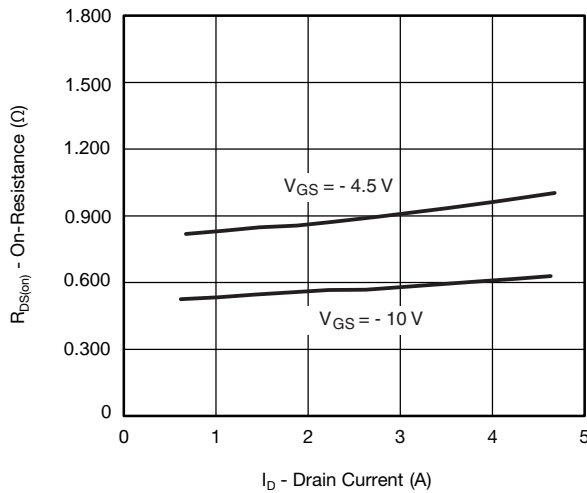
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



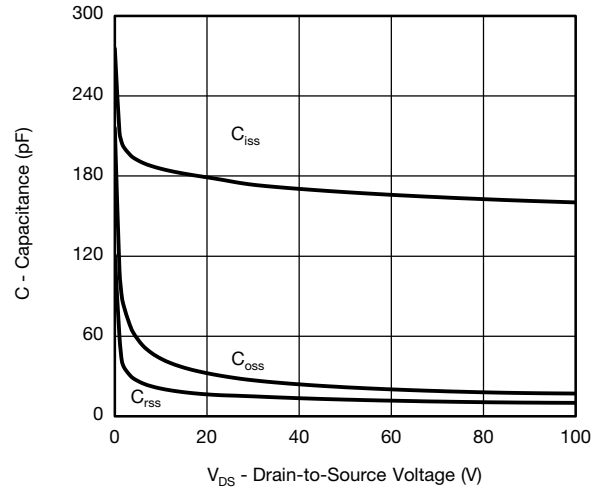
Output Characteristics



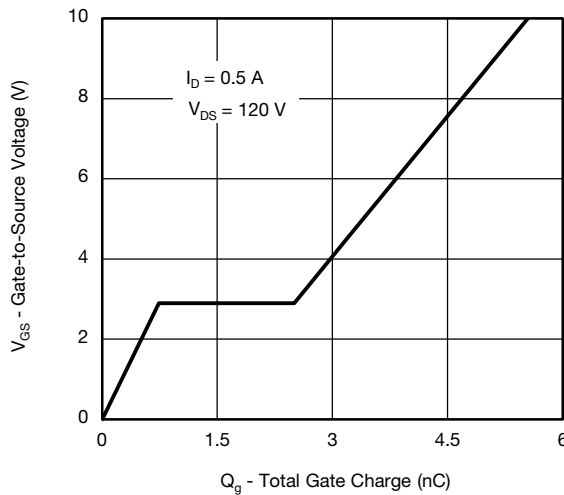
Transfer Characteristics



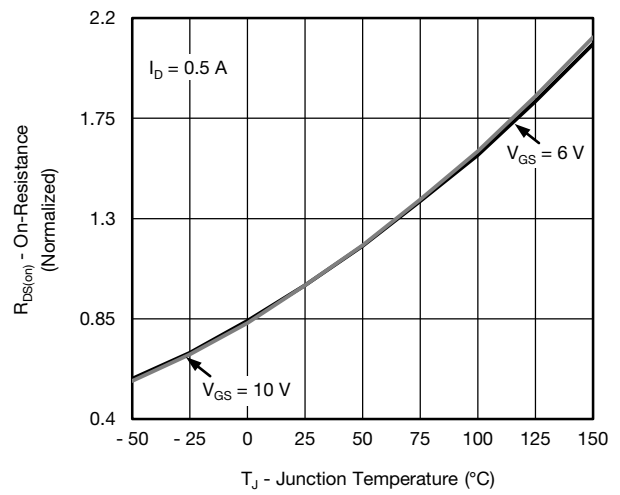
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

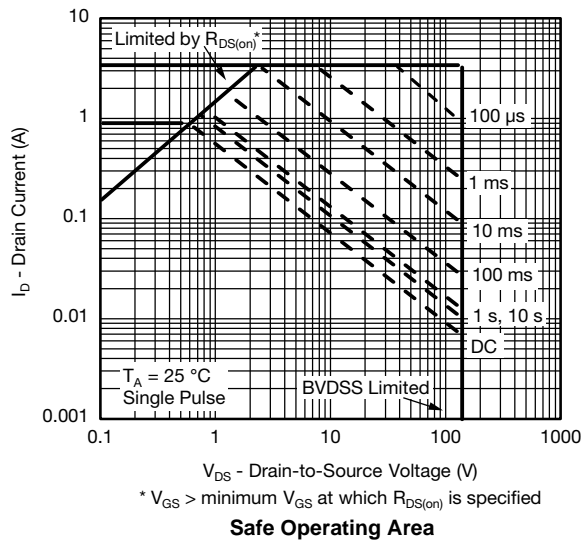
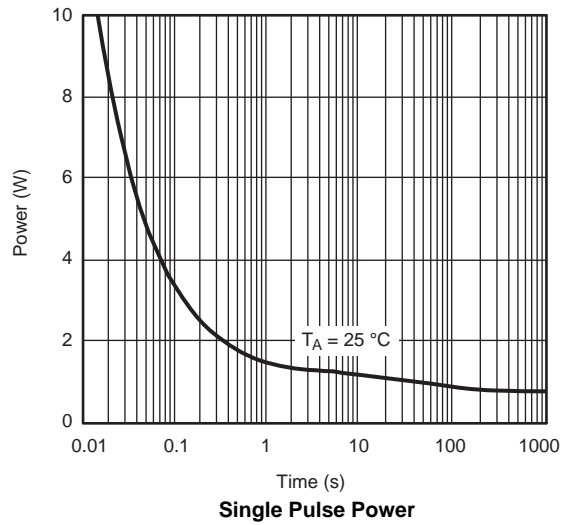
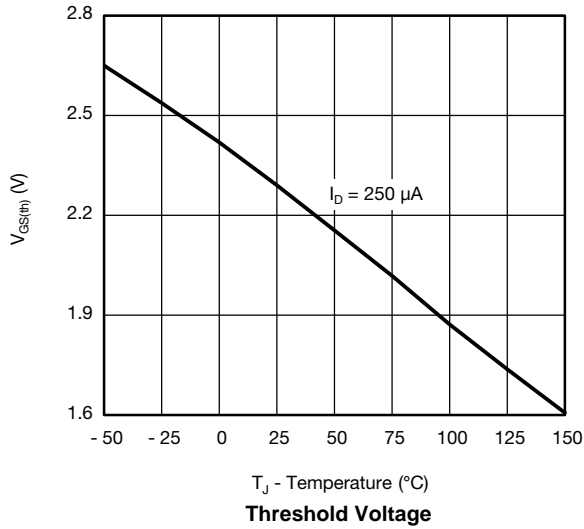
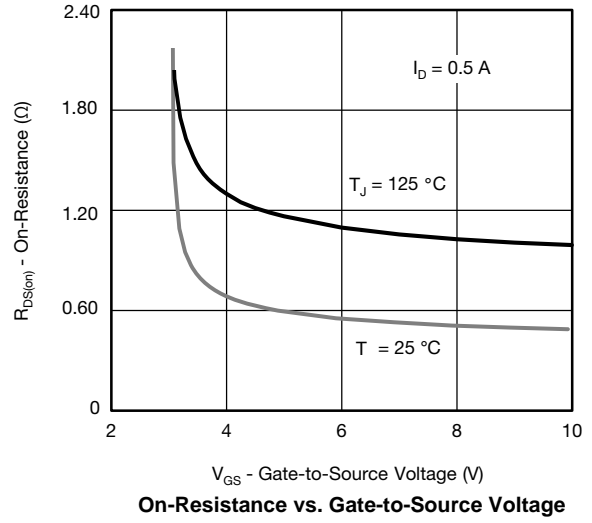
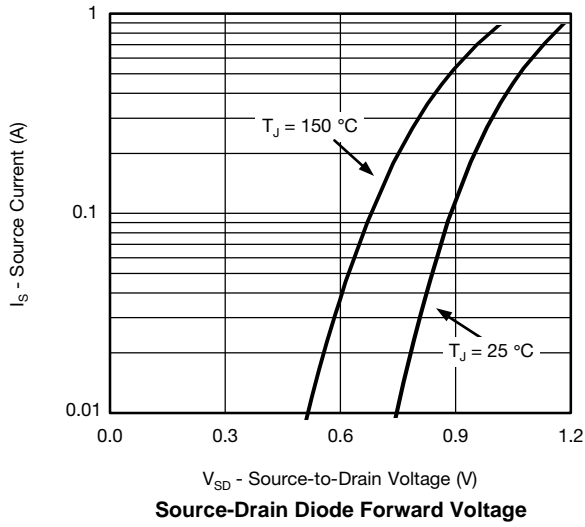


Gate Charge

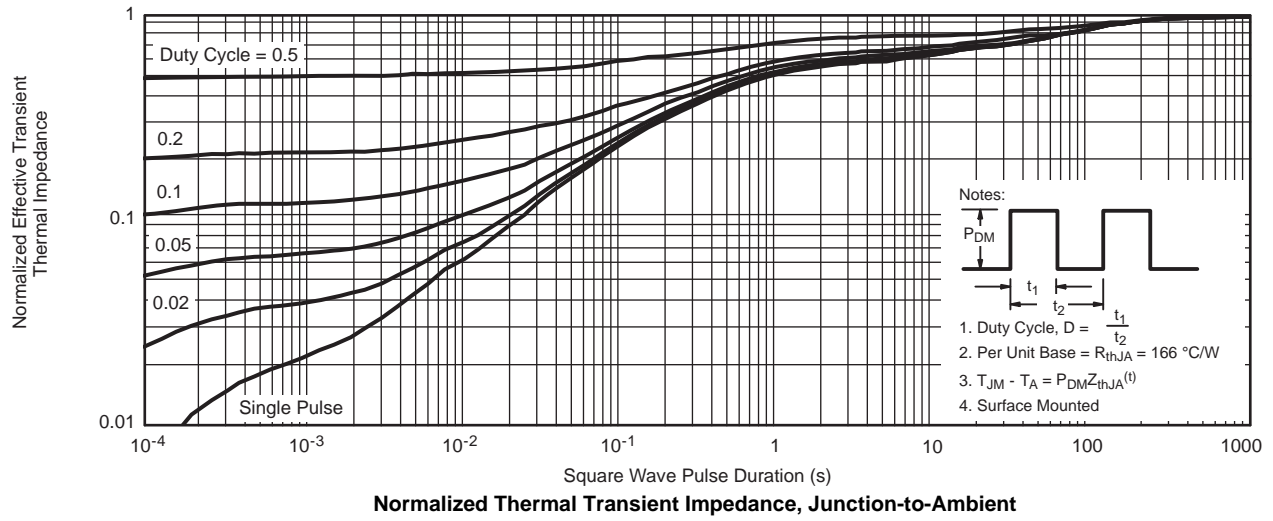


On-Resistance vs. Junction Temperature

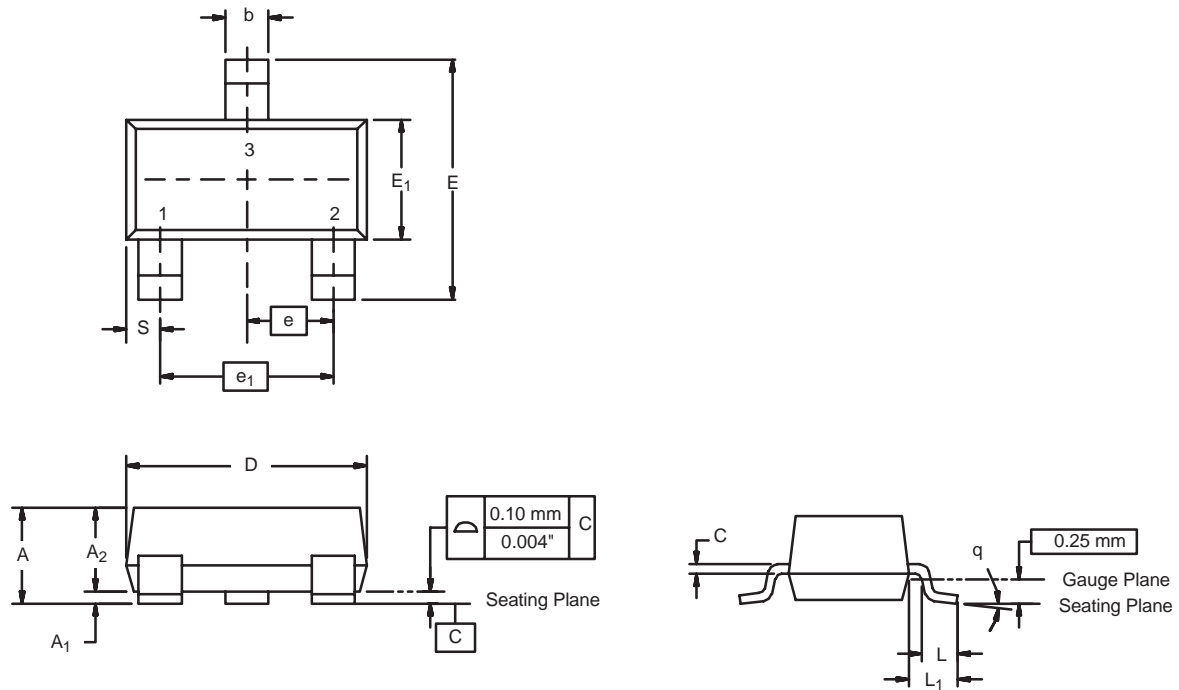
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

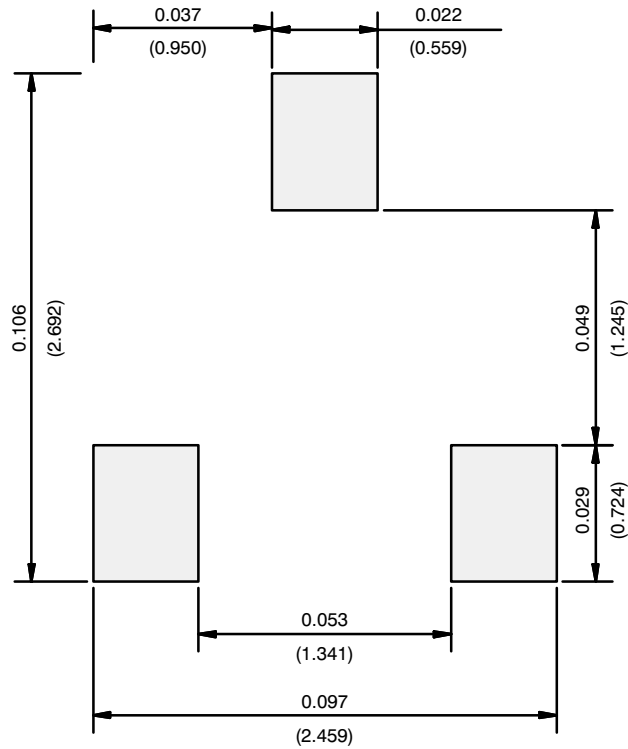


SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A ₁	0.01	0.10	0.0004	0.004
A ₂	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E ₁	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e ₁	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L ₁	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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