

N-Channel 250 V (D-S) MOSFET

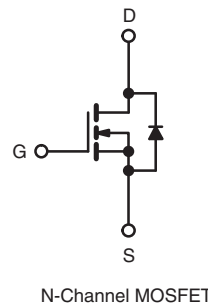
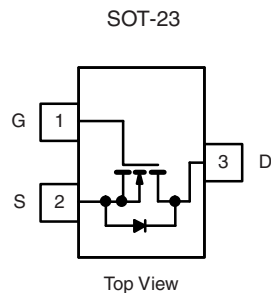
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
250	1.4 at $V_{GS} = 10$ V	0.6
	1.5 at $V_{GS} = 4.5$ V	

FEATURES

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

APPLICATIONS

- Load switch
- Power management for mobile computing



ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	250	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	0.6	A
		$T_A = 70$ °C	0.5	
Pulsed Drain Current ^b	I_{DM}	2.4		
Continuous Source Current (Diode Conduction) ^a	I_S	0.6	A	
Power Dissipation ^a	P_D	$T_A = 25$ °C	1.26	W
		$T_A = 70$ °C	0.81	
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	R_{thJA}	$t \leq 5$ s	75	100	°C/W
		Steady State	125	170	
Maximum Junction-to-Foot	R_{thJF}	40	55		

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						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 1 mA	250			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		2.3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 200 V, V _{GS} = 0 V			1	μA
		V _{DS} = 200 V, V _{GS} = 0 V, T _J = 70 °C			75	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 15 V, V _{GS} = 10 V	0.6			A
Drain-Source On-Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 0.3 A		1.4	4	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 0.3 A		1.5		S
Diode Forward Voltage	V _{SD}	I _S = 1 A, V _{GS} = 0 V		0.7	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 125 V, V _{GS} = 10 V, I _D = 0.3 A		5.5	8	nC
Gate-Source Charge	Q _{gs}			0.9		
Gate-Drain Charge	Q _{gd}			1.35		
Gate Resistance	R _g			1.3		Ω
Switching						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 125 V, f = 1 MHz		165		pF
Output Capacitance	C _{oss}			32		
Reverse Transfer Capacitance	C _{rss}			11		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 125 V, R _L = 30 Ω I _D ≅ 0.3 A, V _{GEN} = 10 V, R _g = 6 Ω		4.2		ns
Rise Time	t _r			10		
Turn-Off Delay Time	t _{d(off)}			19		
Fall Time	t _f			13		

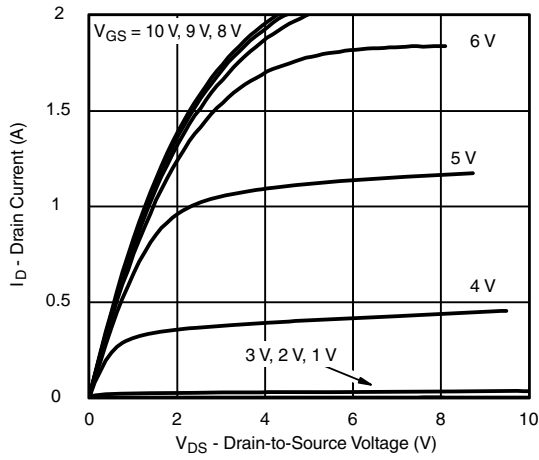
Notes:

a. Pulse test: PW ≤ 300 μs, duty cycle ≤ 2 %.

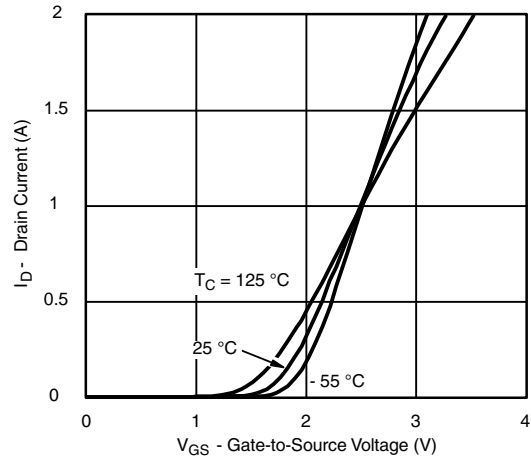
b. Guaranteed by design, not subject to production testing.

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.

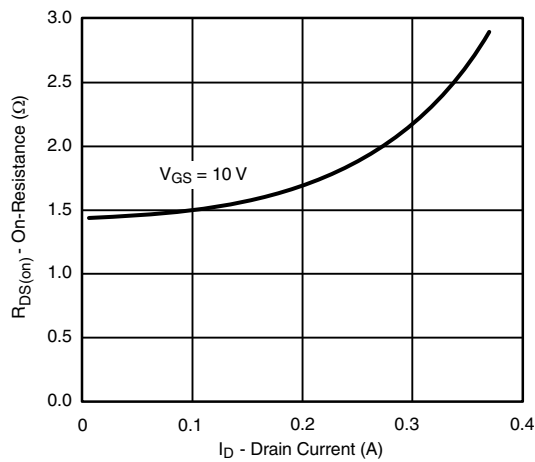
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



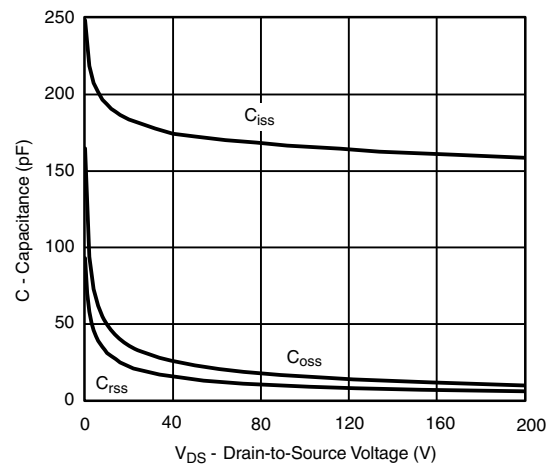
Output Characteristics



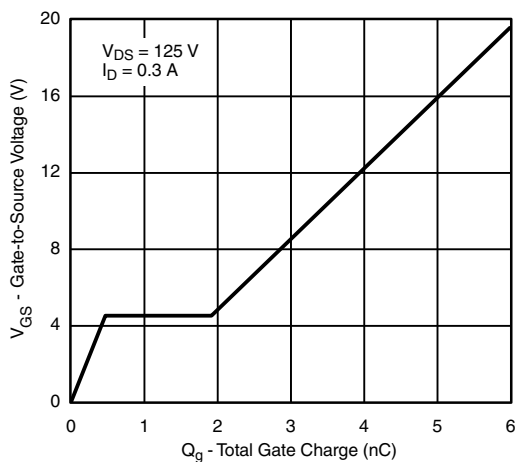
Transfer Characteristics



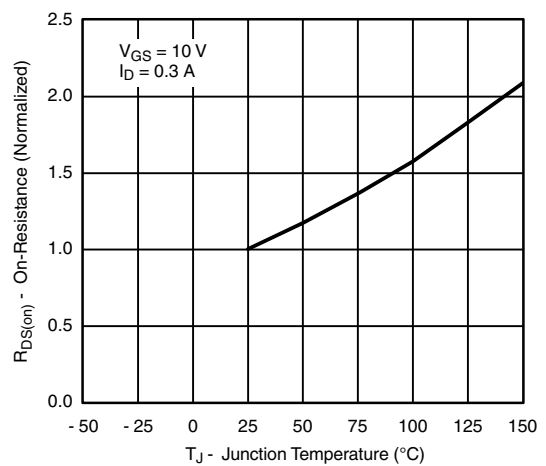
On-Resistance vs. Drain Current



Capacitance

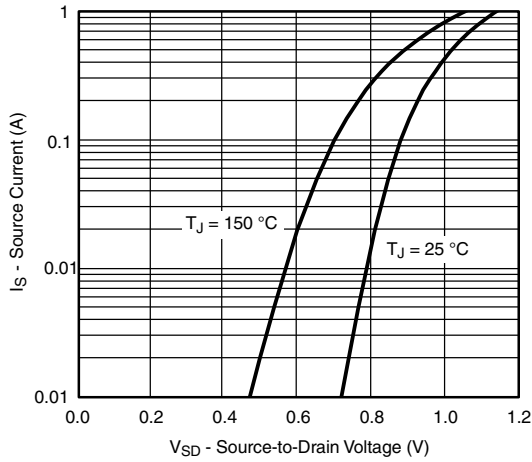


Gate Charge

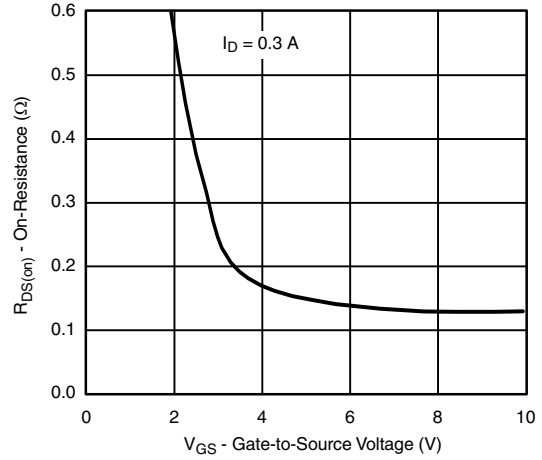


On-Resistance vs. Junction Temperature

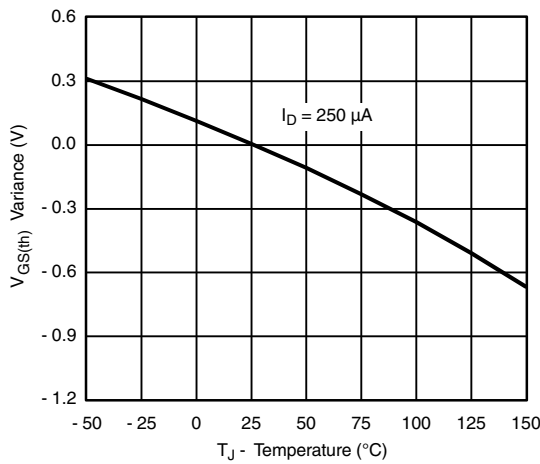
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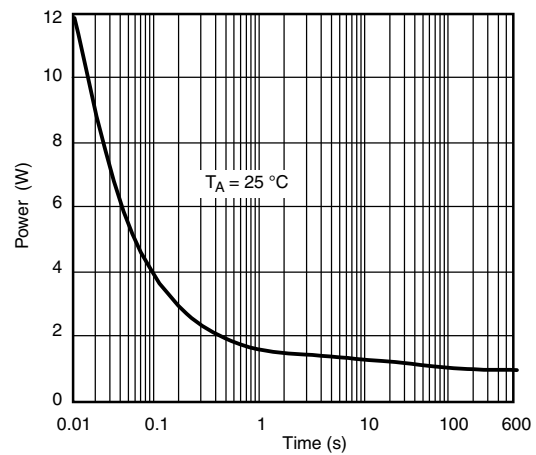
Source-Drain Diode Forward Voltage



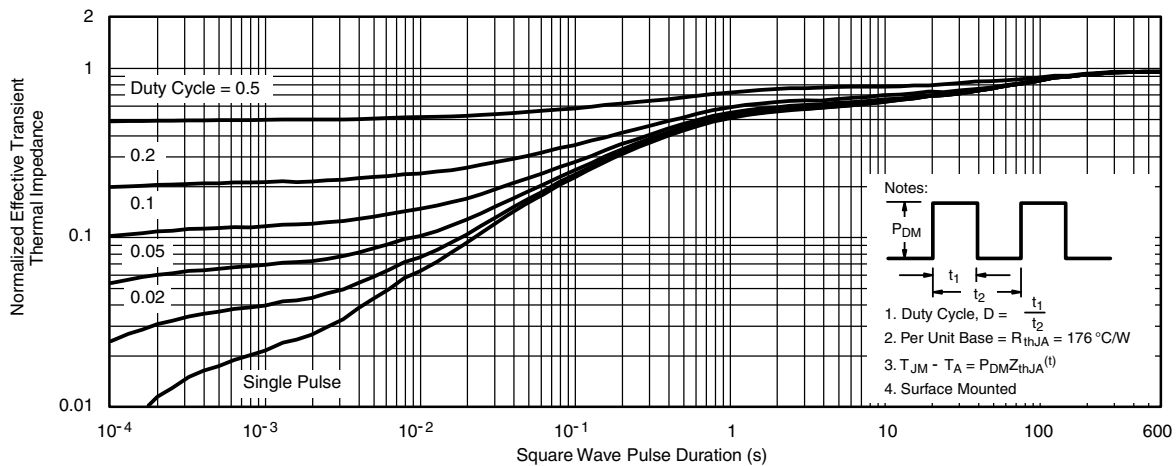
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power

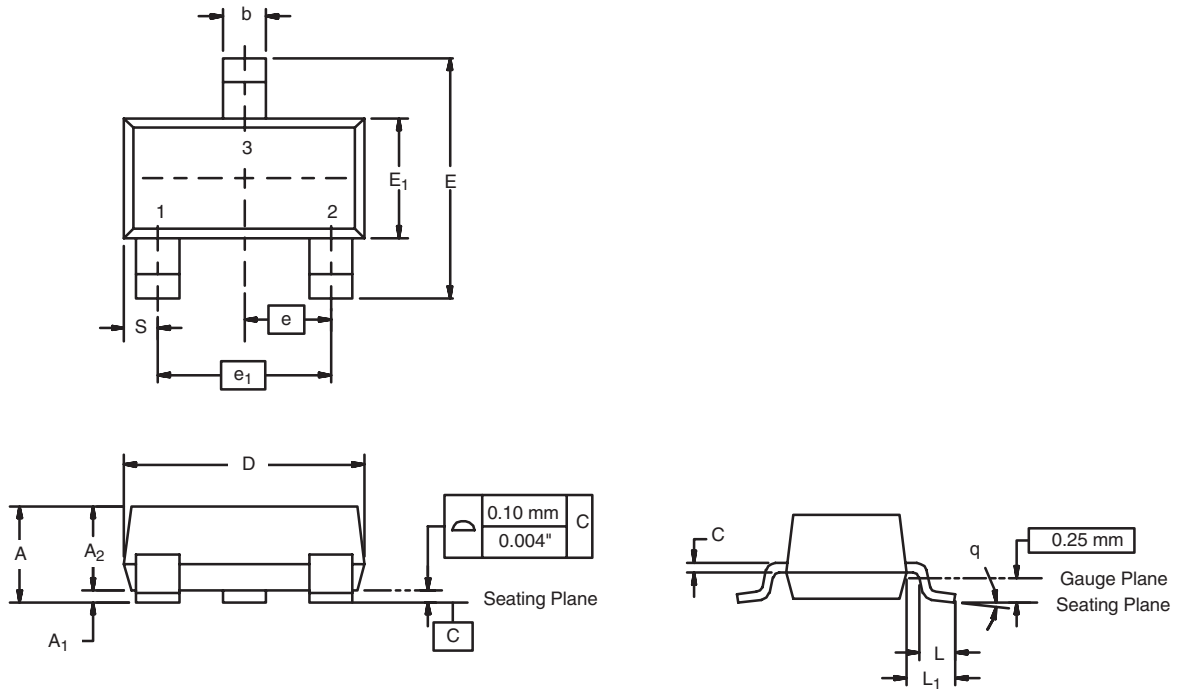


Normalized Thermal Transient Impedance, Junction-to-Ambient

Notes:

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1. Duty Cycle, $D = \frac{t_1}{t_2}$
 2. Per Unit Base = $R_{thJA} = 176 \text{ }^\circ\text{C/W}$
 3. $T_{JM} - T_A = P_{DM} Z_{thJA}^{(t)}$
 4. Surface Mounted

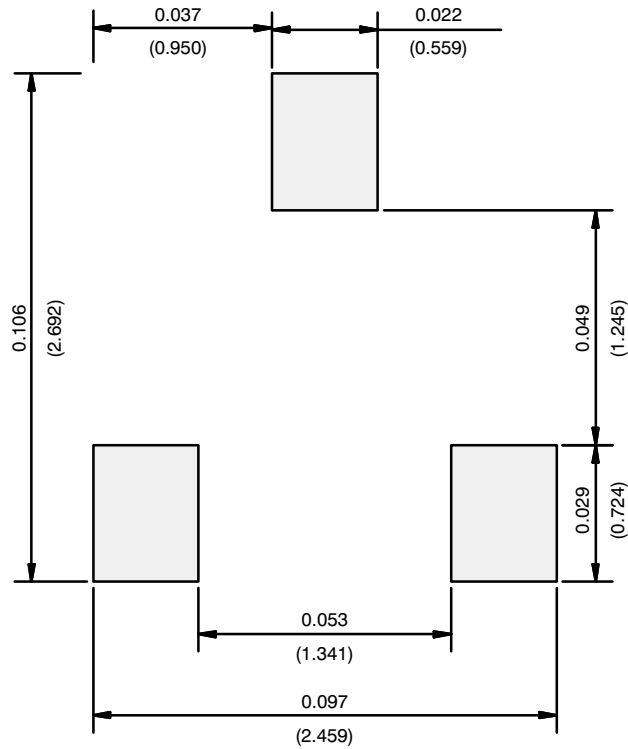
SOT-23 (TO-236): 3-LEAD



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°

ECN: S-03946-Rev. K, 09-Jul-01
DWG: 5479

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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