

N-Channel 250 V (D-S) MOSFET

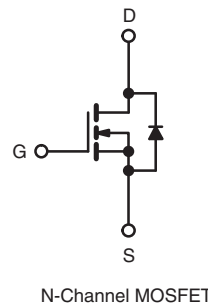
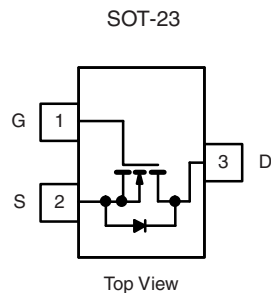
PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
250	1.4 at V _{GS} = 10 V	0.6
	1.5 at V _{GS} = 4.5 V	

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 ≤ 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 ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	250			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0		2.3	
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}	$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}, T_J = 70\text{ }^\circ\text{C}$			75	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 15\text{ V}, V_{GS} = 10\text{ V}$	0.6			A
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.3\text{ A}$		1.4	4	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 0.3\text{ A}$		1.5		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{ A}, V_{GS} = 0\text{ V}$		0.7	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 125\text{ V}, V_{GS} = 10\text{ V}, I_D = 0.3\text{ A}$		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}	$V_{GS} = 0\text{ V}, V_{DS} = 125\text{ V}, f = 1\text{ MHz}$		165		pF
Output Capacitance	C_{oss}			32		
Reverse Transfer Capacitance	C_{rss}			11		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 125\text{ V}, R_L = 30\text{ }\Omega$ $I_D \approx 0.3\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$		4.2		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			19		
Fall Time	t_f			13		

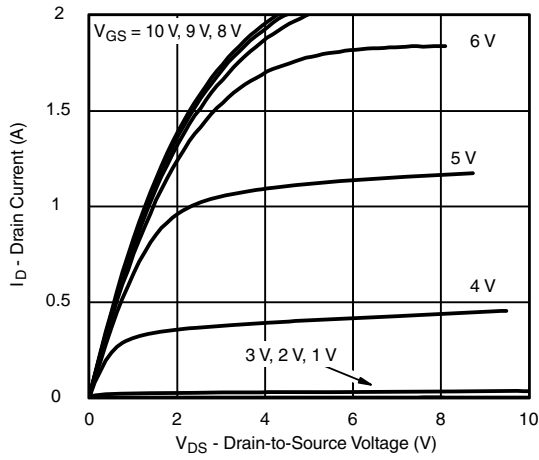
Notes:

a. Pulse test: $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

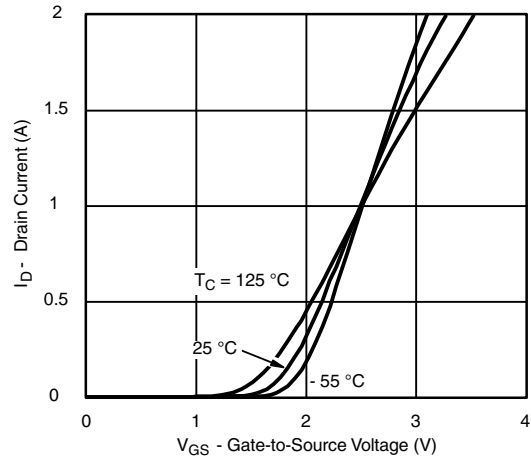
b. Guaranteed by design, not subject to production testing.

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.

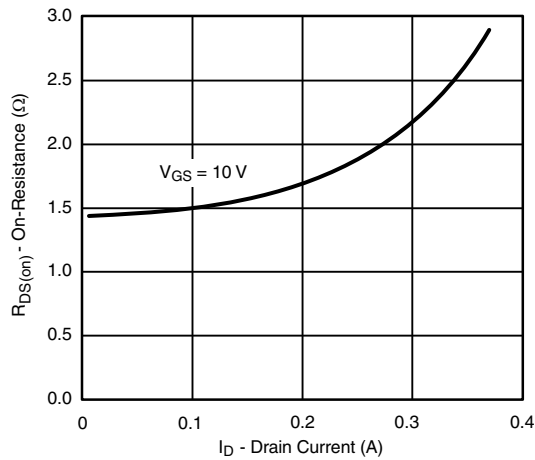
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



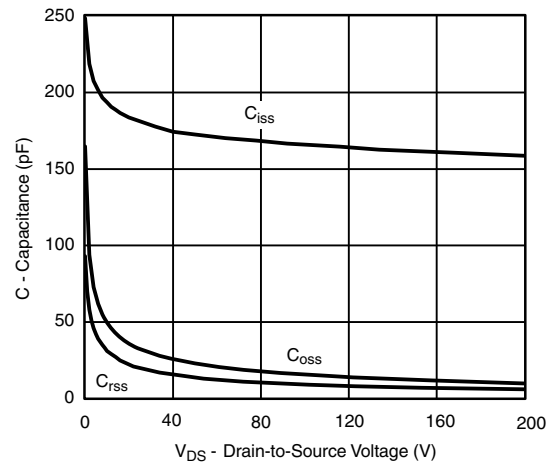
Output Characteristics



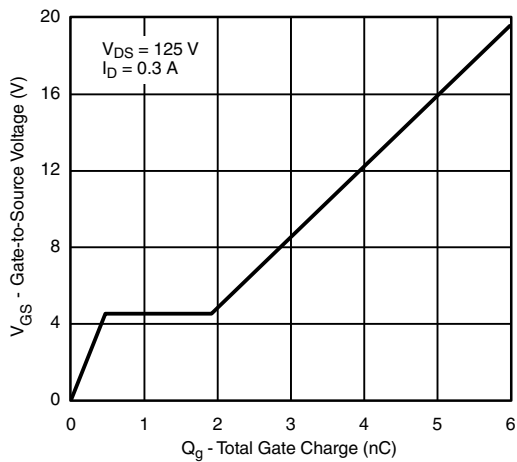
Transfer Characteristics



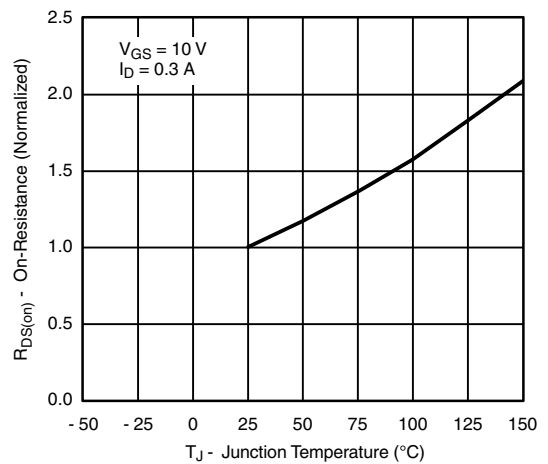
On-Resistance vs. Drain Current



Capacitance

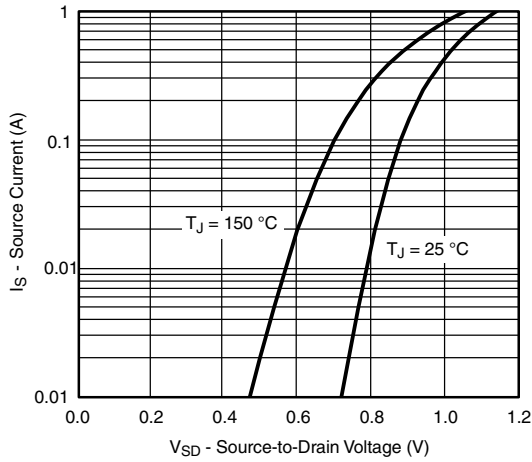


Gate Charge

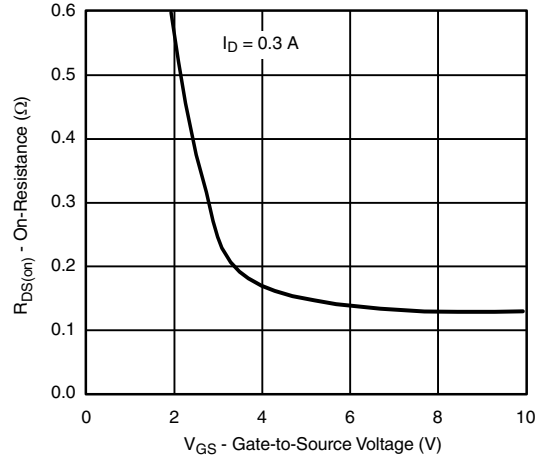


On-Resistance vs. Junction Temperature

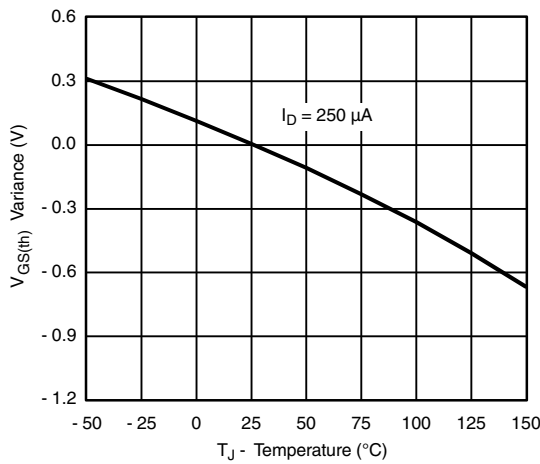
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



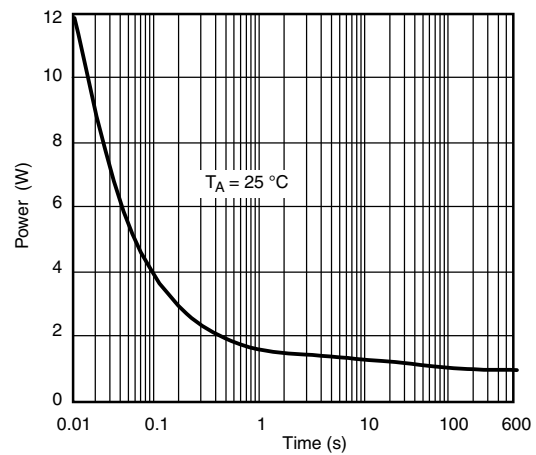
Source-Drain Diode Forward Voltage



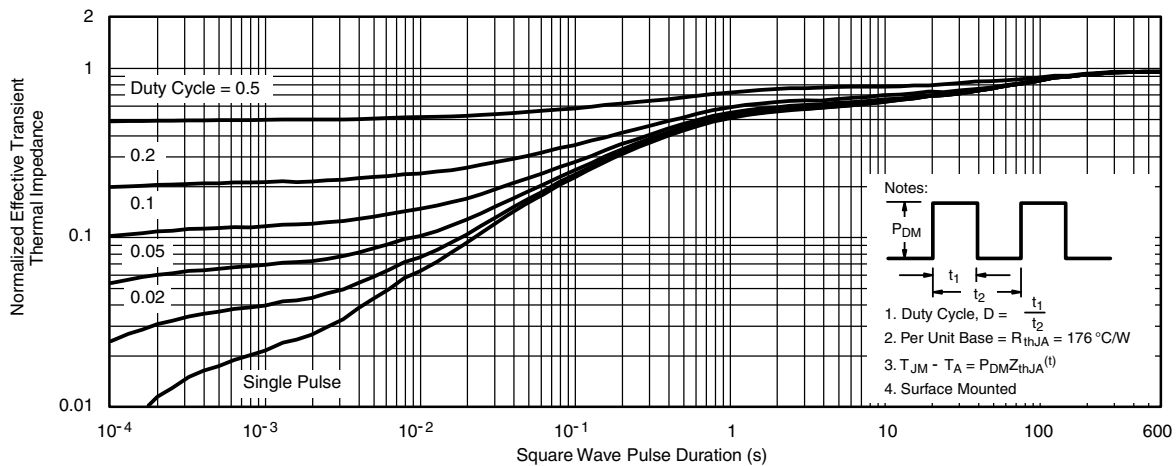
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power

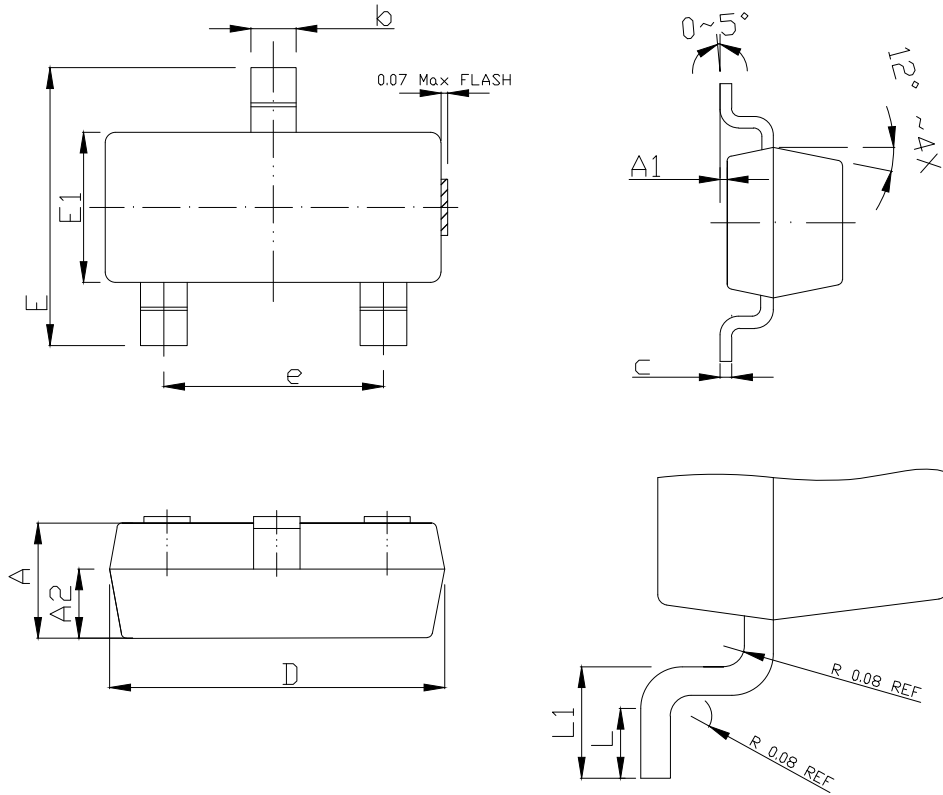


Normalized Thermal Transient Impedance, Junction-to-Ambient

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 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.80	1.00	1.30
A1	0.00	0.05	0.15
b	0.25	0.40	0.55
c	0.11 BSC		
D	2.60	2.90	3.20
E	2.10	2.40	2.70
E1	1.10	1.30	1.48
e	1.90 BSC		
L	0.17	-	-
L1	0.28	0.40	0.53
A2	0.60 REF		

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