N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
100	0.015 at V_{GS} = 10 V	19

FEATURES

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

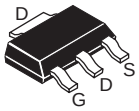
Pb-free

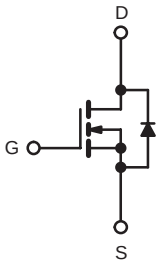
RoHS COMPLIANT

APPLICATIONS

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

SOT-223





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 175 °C)[a]	T_A = 25 °C	I_D	19	A
	T_A = 70 °C		13	
Pulsed Drain Current		I_{DM}	76	
Avalanche Current		I_{AS}	7.8	
Single Pulse Avalanche Energy		E_{AS}	55	mJ
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	19.5	W
	T_A = 70 °C		12.5	
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]	t ≤ 10 s	R_{thJA}	30	45	°C/W
	Steady State		50	65	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	7.5	20	

Notes:

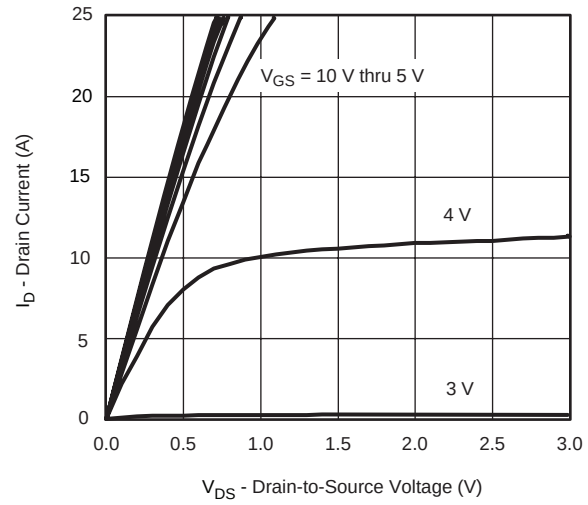
a. Surface Mounted on 1" x 1" FR4 board.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA		26		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			5.6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.5		3.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 55 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = - 10 V	19			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D =7 A		0.015	0.020	Ω
		V_{GS} =4.5 V, I_D = 5 A		0.027	0.035	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 7 A		17		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz		1013		pF
Output Capacitance	C_{oss}			212		
Reverse Transfer Capacitance	C_{rss}			85		
Total Gate Charge	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 7 A		19		nC
		V_{DS} = 50 V, V_{GS} = 4.5 V, I_D = 5 A		11		
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			15		
Gate Resistance	R_g	f = 1 MHz		1.6		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 50 V, R_L = 15 Ω $I_D \cong$ 7 A, V_{GS} = 10 V, R_g = 1 Ω		7		ns
Rise Time	t_r			9		
Turn-Off Delay Time	$t_{d(off)}$			18		
Fall Time	t_f			12		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 50 V, R_L = 15 Ω $I_D \cong$ 5 A, V_{GS} = 4.5 V, R_g = 1 Ω		10		
Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			21		
Fall Time	t_f			16		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			19	A
Pulse Diode Forward Current[a]	I_{SM}				76	
Body Diode Voltage	V_{SD}	I_S = 1 A		0.5	1.0	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 7 A, dI/dt = 100 A/µs, T_J = 25 °C		40		ns
Body Diode Reverse Recovery Charge	Q_{rr}			35		nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			10		

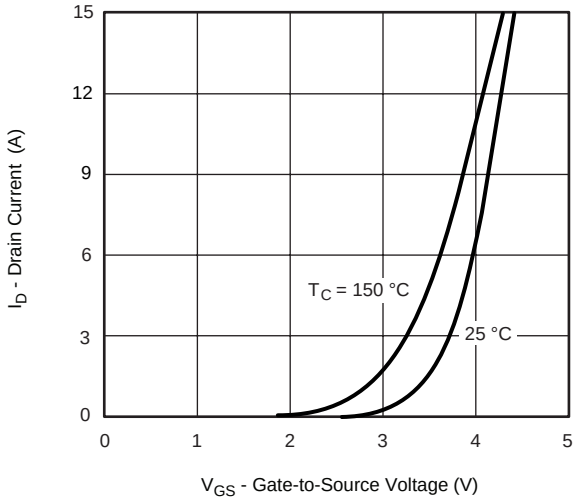
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

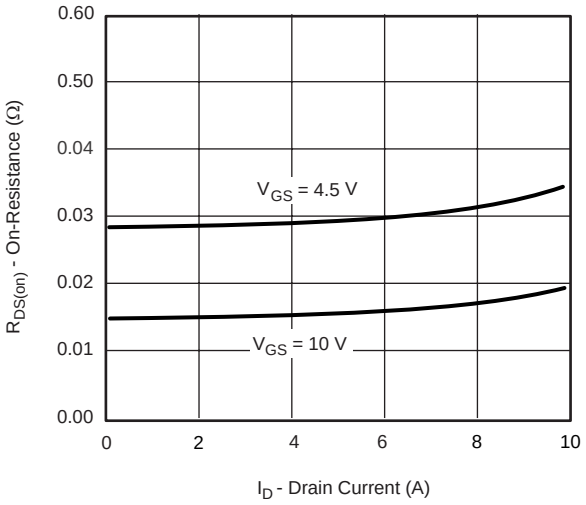
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



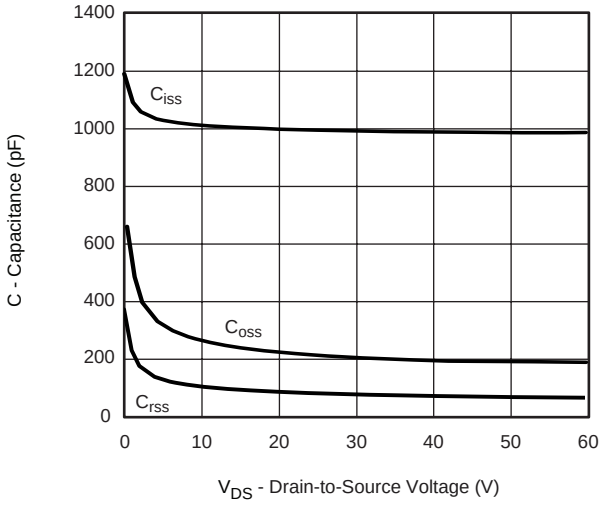
Output Characteristics



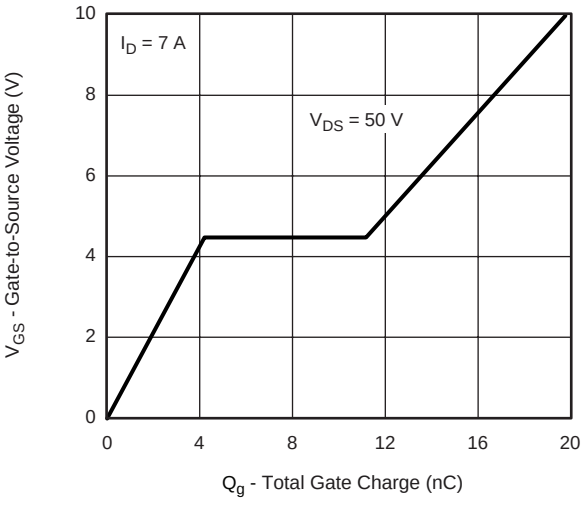
Transfer Characteristics



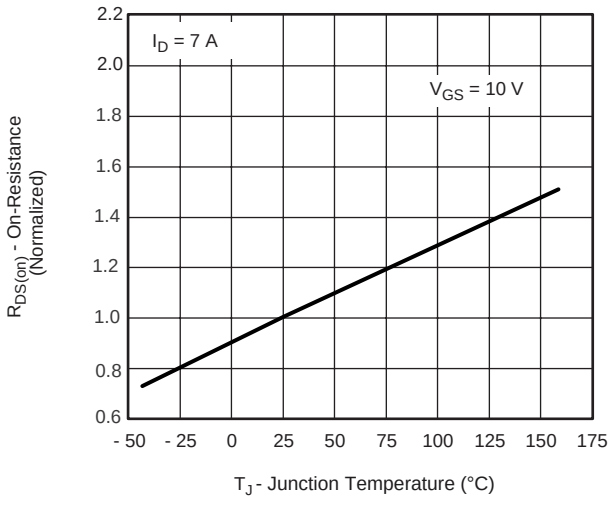
On-Resistance vs. Drain Current



Capacitance

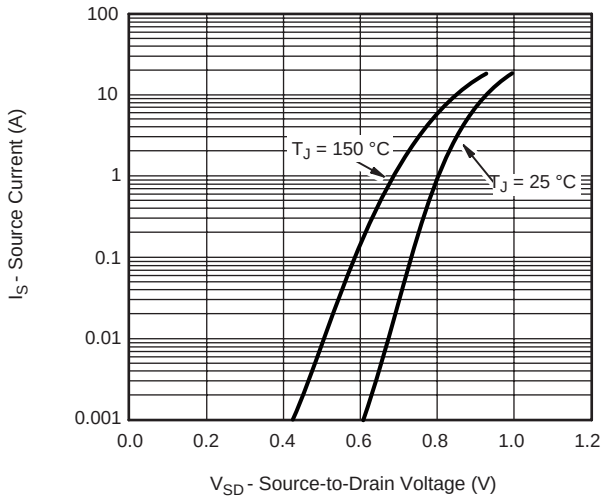


Gate Charge

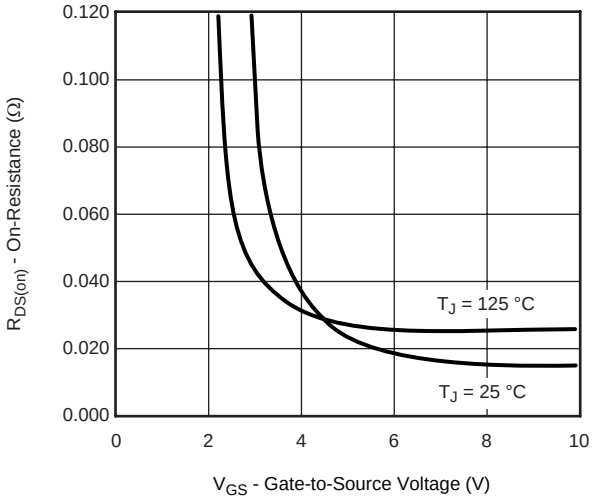


On-Resistance vs. Junction Temperature

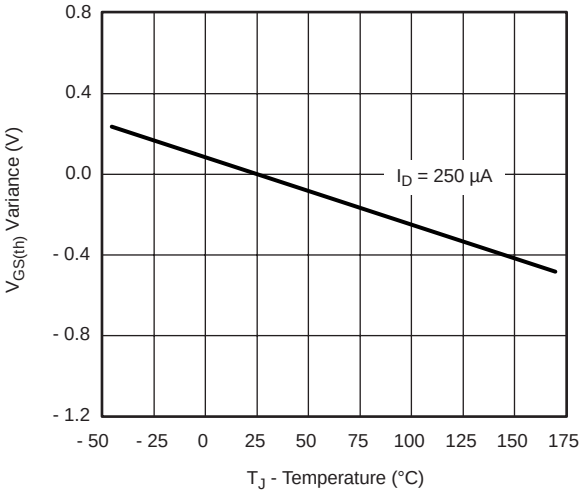
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



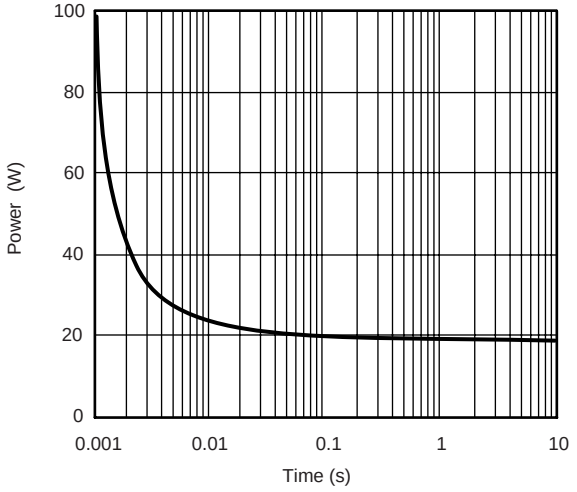
Source-Drain Diode Forward Voltage



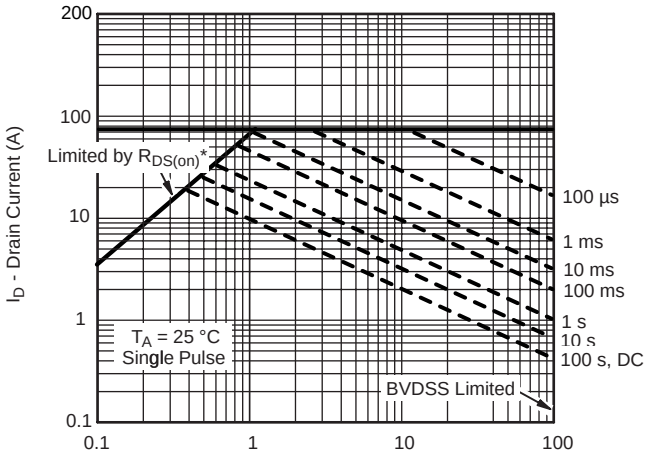
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

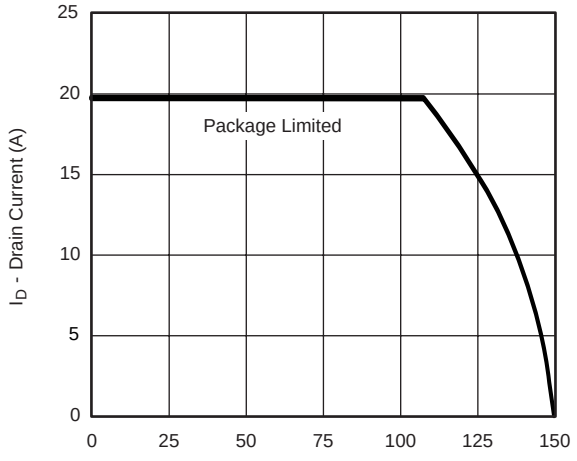


Single Pulse Power, Junction-to-Ambient



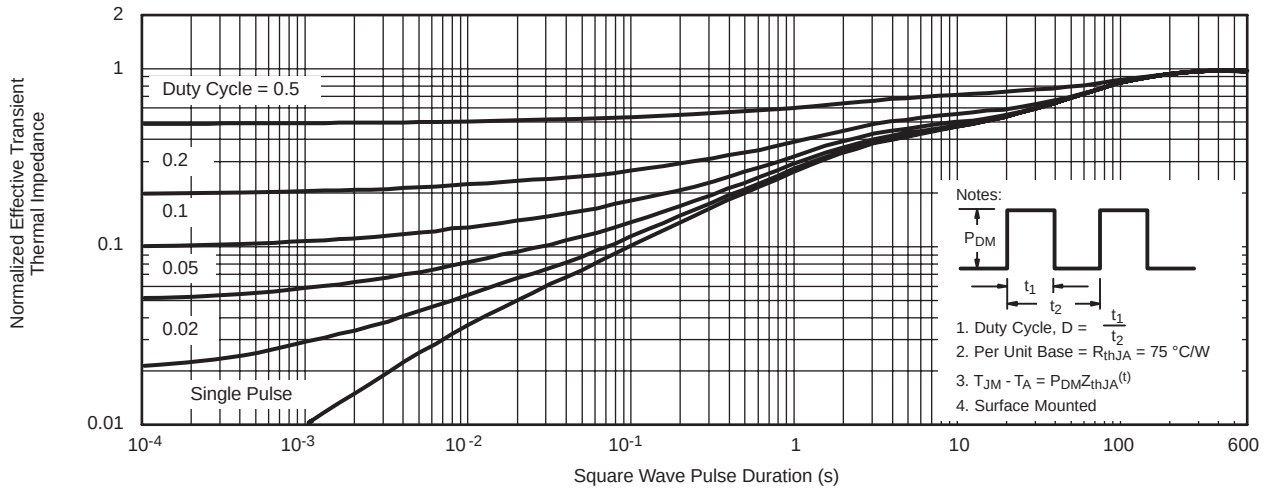
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient



Current Derating*

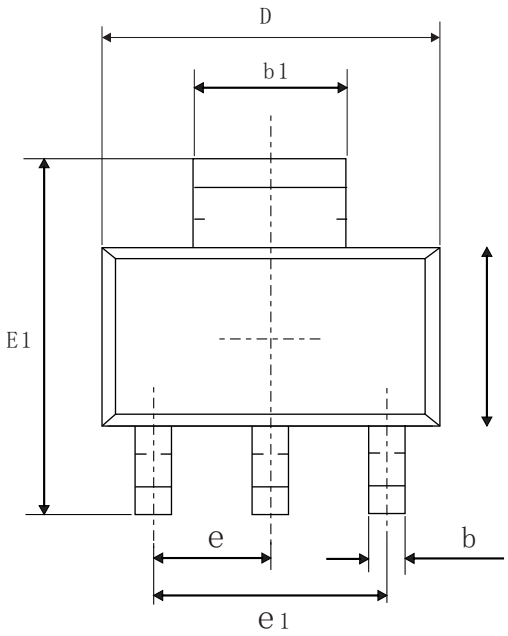
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



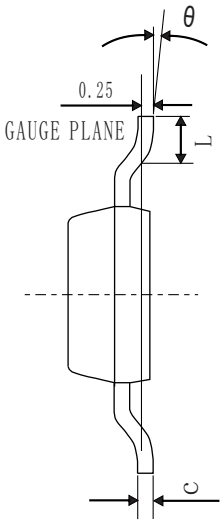
Normalized Thermal Transient Impedance, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

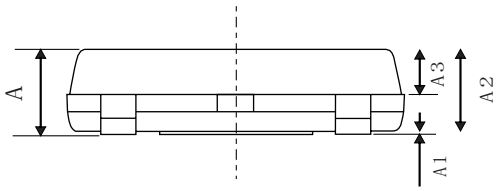
SOT-223-3L PACKAGE OUTLINE



TOP VIEW



SIDE VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	-	-	1.95
A1	0.00	0.05	0.16
A2	1.35	1.60	1.85
A3	0.65	0.90	1.15
b	0.55	0.70	0.90
b1	2.75	3.00	3.30
C	0.18	0.30	0.42
D	6.00	6.50	7.00
E	3.10	3.50	3.90
E1	6.50	7.00	7.50
e1	4.20	4.60	5.00
L	0.78	-	1.28
θ	0°	5°	10°
e	2.3BSC		

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