

P-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 100	0.036 at $V_{GS} = - 10$ V	- 50	32
	0.039 at $V_{GS} = - 4.5$ V	- 40	

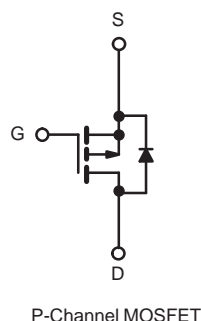
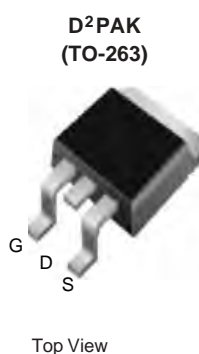
FEATURES

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



APPLICATIONS

- Power Switch
- DC/DC Converters
- Portable equipment and battery powered systems



ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C - 50	A
		$T_C = 75$ °C - 45	
Pulsed Drain Current	I_{DM}	- 200	
Avalanche Current	I_{AS}	- 42	
Single Avalanche Energy ^a	E_{AS}	49	mJ
Maximum Power Dissipation ^a	P_D	$T_C = 25$ °C 133 ^b	W
		$T_A = 25$ °C ^c 4.1	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^c	R_{thJA}	48	°C/W
Junction-to-Case (Drain)	R_{thJC}	2.1	

Notes:

a. Duty cycle ≤ 1 %.

b. See SOA curve for voltage derating.

c. When Mounted on 1" square PCB (FR-4 material).

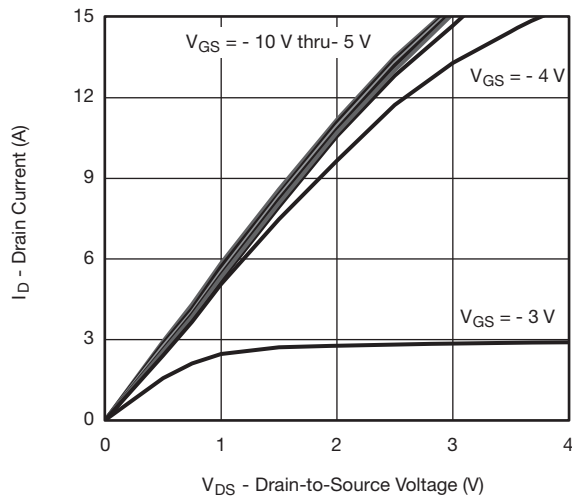
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^{\circ}\text{C}$			- 50	
		$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^{\circ}\text{C}$			- 250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -10\text{ V}, V_{GS} = -10\text{ V}$	- 160			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.036	0.045	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -3\text{ A}$		0.039	0.050	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -5\text{ A}$		17		S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -50\text{ V}, f = 1\text{ MHz}$		8450		pF
Output Capacitance	C_{oss}			1405		
Reverse Transfer Capacitance	C_{rss}			504		
Total Gate Charge ^c	Q_g	$V_{DS} = -50\text{ V}, V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		35		nC
		$V_{DS} = -50\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -3\text{ A}$		15		
Q_{gs}			8			
Q_{gd}			6			
Gate Resistance	R_g	$f = 1\text{ MHz}$	1.2	5.8	11.5	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -50\text{ V}, R_L = 17.2\text{ }\Omega$ $I_D \cong -2.9\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		18		ns
Rise Time ^c	t_r			22		
Turn-Off Delay Time ^c	$t_{d(off)}$			49		
Fall Time ^c	t_f			13.5		
Drain-Source Body Diode Ratings and Characteristics $T_C = 25\text{ }^{\circ}\text{C}$ ^b						
Continuous Current	I_S				- 50	A
Pulsed Current	I_{SM}				- 200	
Forward Voltage ^a	V_{SD}	$I_F = -2.9\text{ A}, V_{GS} = 0\text{ V}$		- 0.7	- 1.5	V
Reverse Recovery Time	t_{rr}	$I_F = -2.9\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			- 4	- 6	A
Reverse Recovery Charge	Q_{rr}			98	147	nC

Notes:

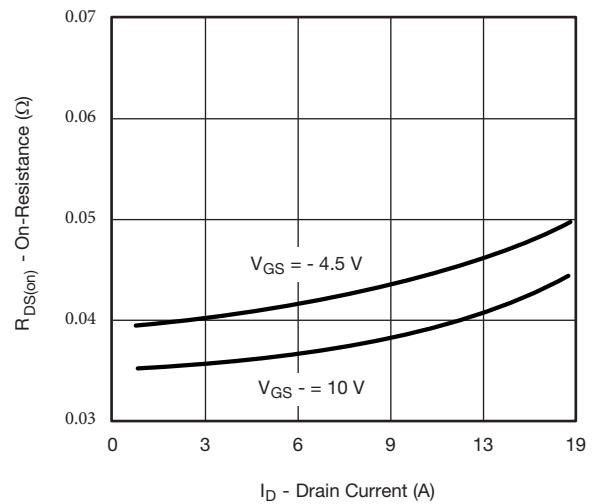
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

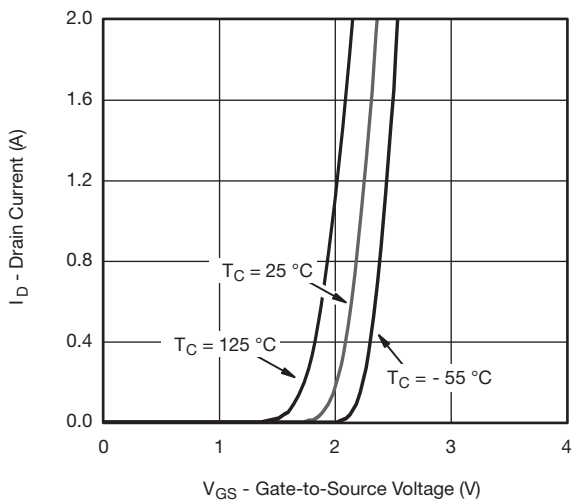
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



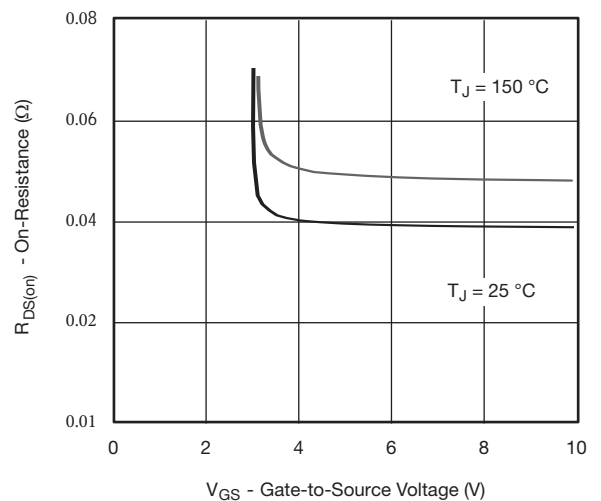
Output Characteristics



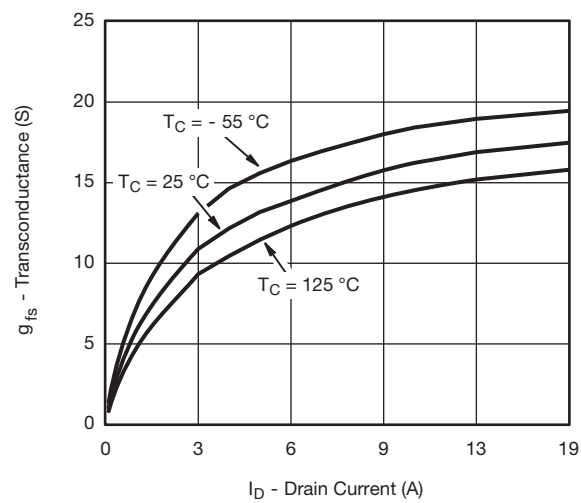
On-Resistance vs. Drain Current



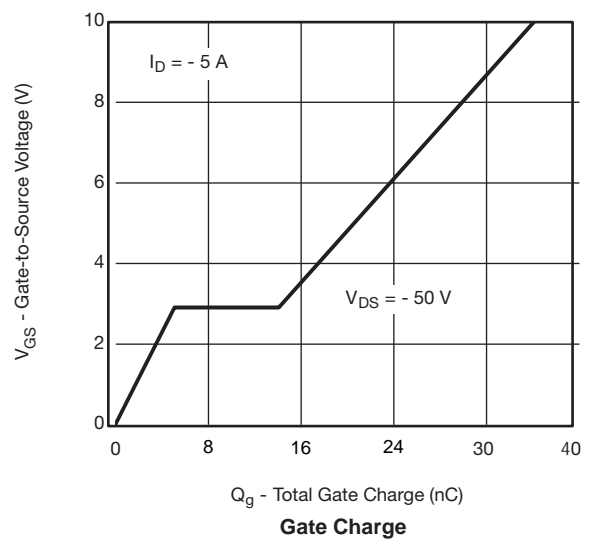
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage

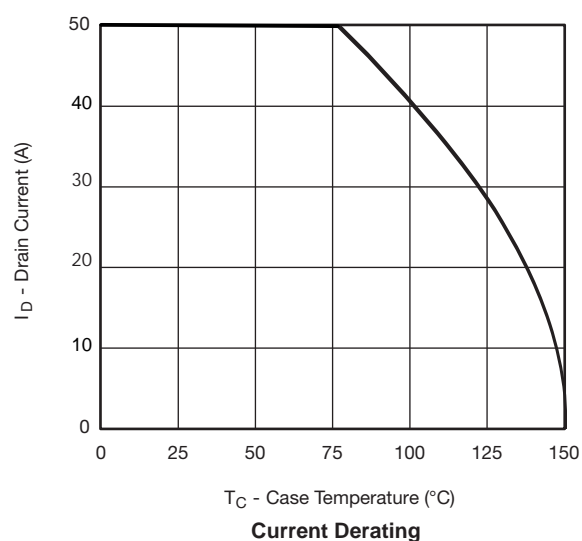
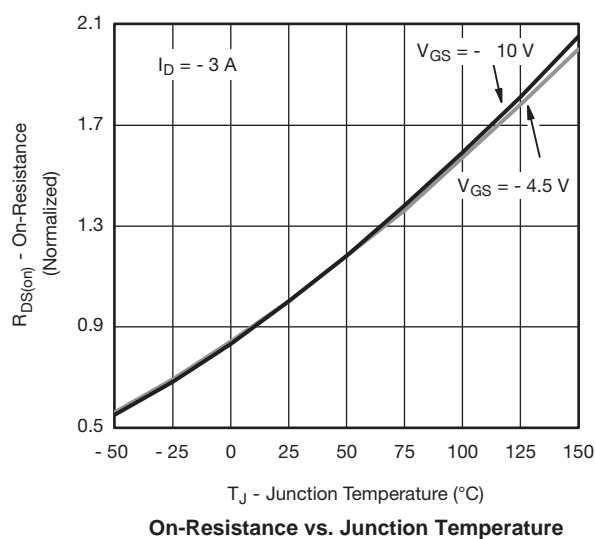
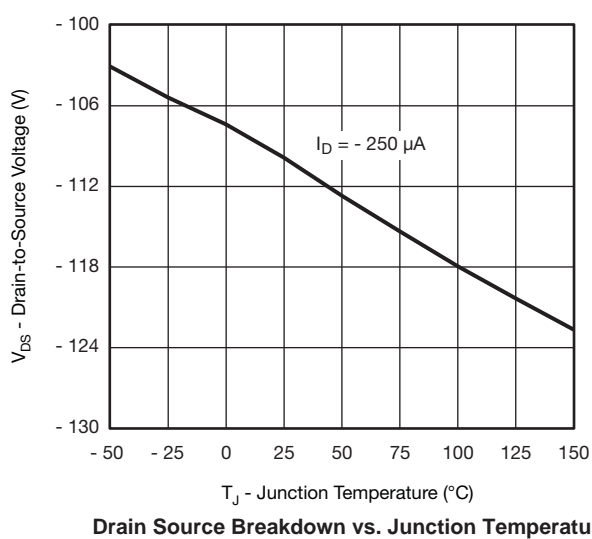
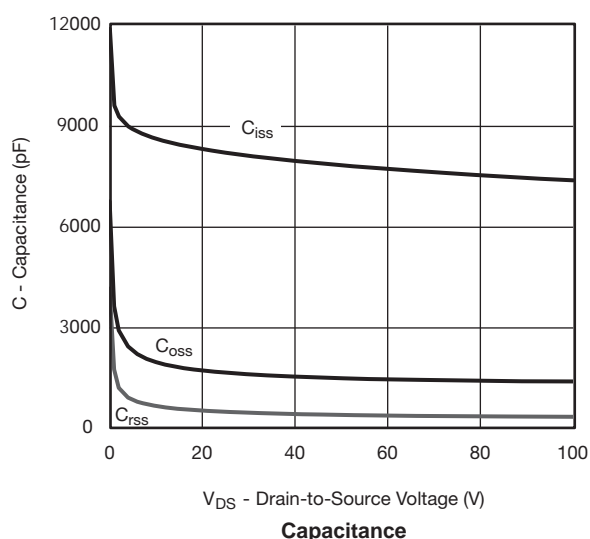
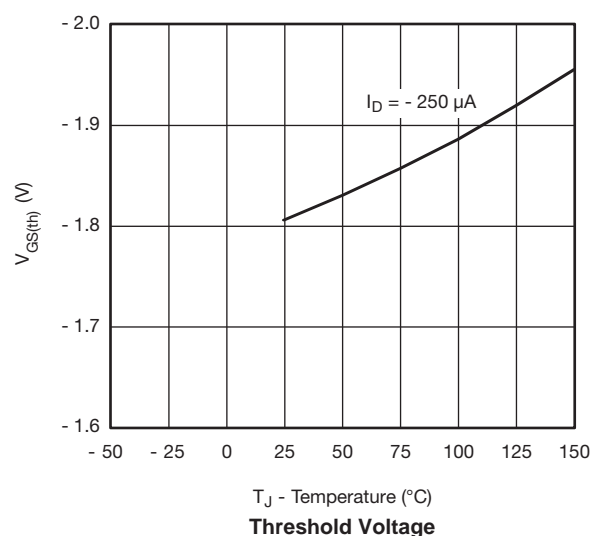
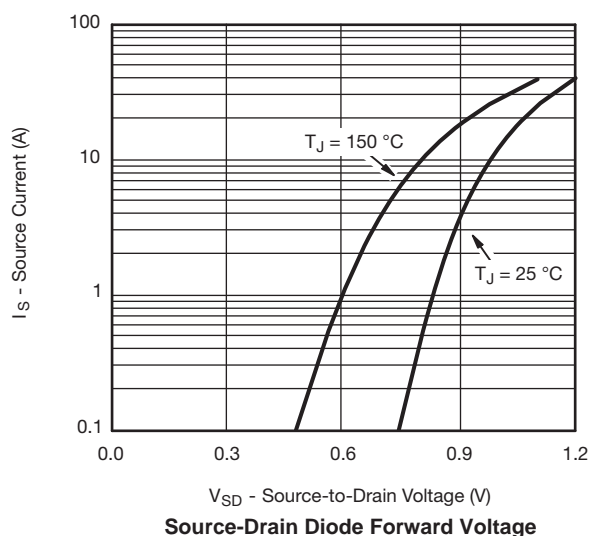


Transconductance

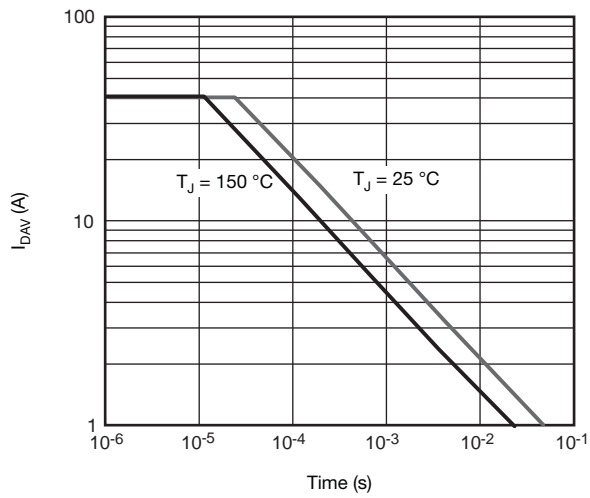


Gate Charge

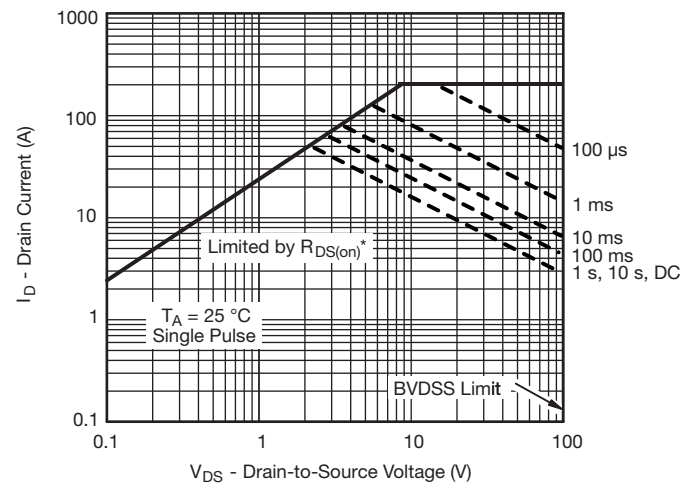
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Single Pulse Avalanche Current Capability vs. Time



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

Safe Operating Area

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