P-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 100	0.010 at V_{GS} = - 10 V	-110	165
	0.014 at V_{GS} = - 4.5 V	-100	

FEATURES

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

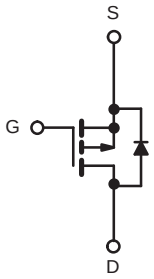
RoHS COMPLIANT

APPLICATIONS

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

D^2PAK (TO-263)

Top View



P-Channel MOSFET

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)	T_C = 25 °C	I_D	- 110	A
	T_C = 75 °C		-92	
Pulsed Drain Current		I_{DM}	- 300	
Avalanche Current		I_{AS}	- 72	
Single Avalanche Energy[a]	L = 0.1 mH	E_{AS}	275	mJ
Maximum Power Dissipation[a]	T_C = 25 °C	P_D	368[b]	W
	T_A = 25 °C[c]		8.2	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Limit**	**Unit**
Junction-to-Ambient (PCB Mount)[c]	R_{thJA}	42	°C/W
Junction-to-Case (Drain)	R_{thJC}	1.0	

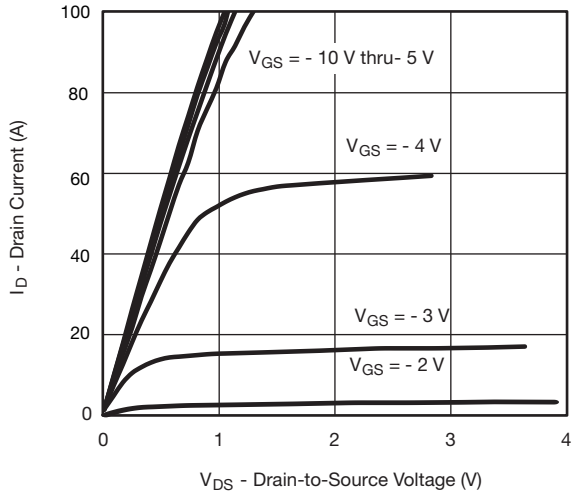
Notes:
a. Duty cycle ≤ 1 %.
b. See SOA curve for voltage derating.
c. When Mounted on 1" square PCB (FR-4 material).

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{DS} = 0 V, I_D = - 250 µA	- 100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 250	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 = 125 °C			- 50	
		V_{DS} = - 80 V, V_{GS} = 0 V, T_J = 150 °C			- 250	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 10 V, V_{GS} = - 10 V	- 110			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 30 A		0.010	0.014	Ω
		V_{GS} = - 4.5 V, I_D = - 20 A		0.014	0.020	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 20 A		57		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = - 50 V, f = 1 MHz		9450		pF
Output Capacitance	C_{oss}			1205		
Reverse Transfer Capacitance	C_{rss}			350		
Total Gate Charge[c]	Q_g	V_{DS} = - 50 V, V_{GS} = - 10 V, I_D = - 30 A		165		nC
		V_{DS} = - 50 V, V_{GS} = - 4.5 V, I_D = - 20 A		130		
Gate-Source Charge[c]	Q_{gs}			43		
Gate-Drain Charge[c]	Q_{gd}			48		
Gate Resistance	R_g	f = 1 MHz	1.2	5.5	13.5	Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = - 50 V, R_L = 17.2 Ω $I_D \cong$ - 30 A, V_{GEN} = - 10 V, R_g = 1 Ω		28		ns
Rise Time[c]	t_r			42		
Turn-Off Delay Time[c]	$t_{d(off)}$			106		
Fall Time[c]	t_f			33.5		
Drain-Source Body Diode Ratings and Characteristics T_C = 25 °C[b]						
Continuous Current	I_S				- 100	A
Pulsed Current	I_{SM}				- 300	
Forward Voltage[a]	V_{SD}	I_F = - 30 A, V_{GS} = 0 V		- 0.7	- 1.5	V
Reverse Recovery Time	t_{rr}	I_F = - 30 A, dI/dt = 100 A/µs		90		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			- 7	- 12	A
Reverse Recovery Charge	Q_{rr}			390	650	nC

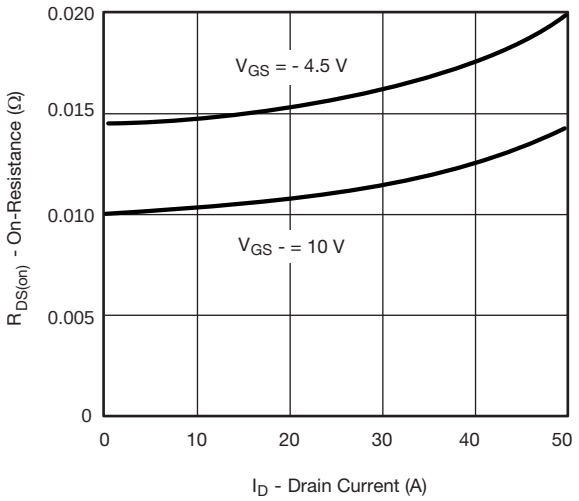
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

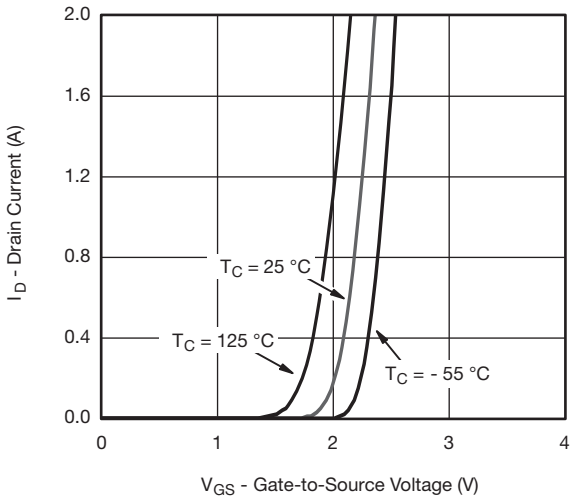
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



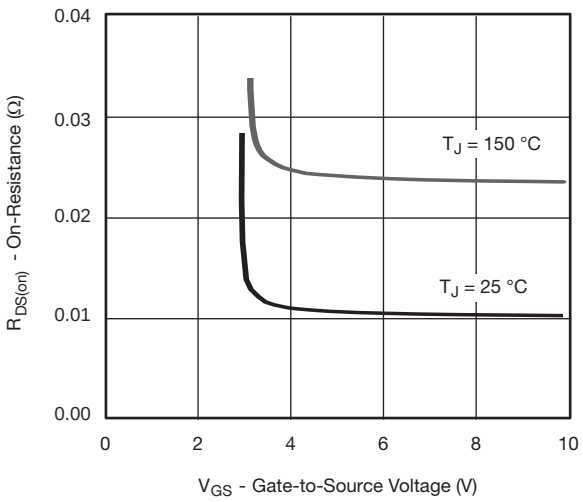
Output Characteristics



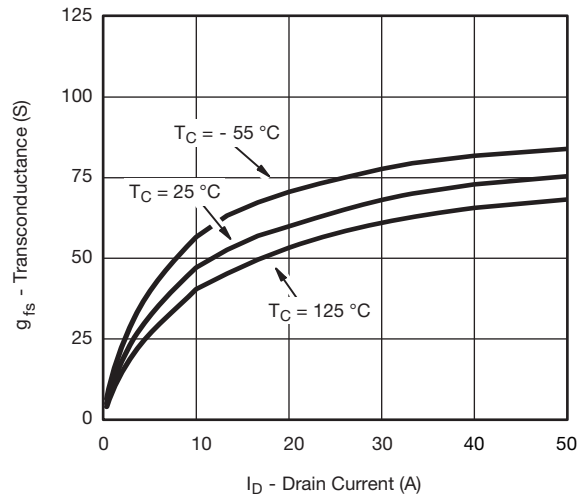
On-Resistance vs. Drain Current



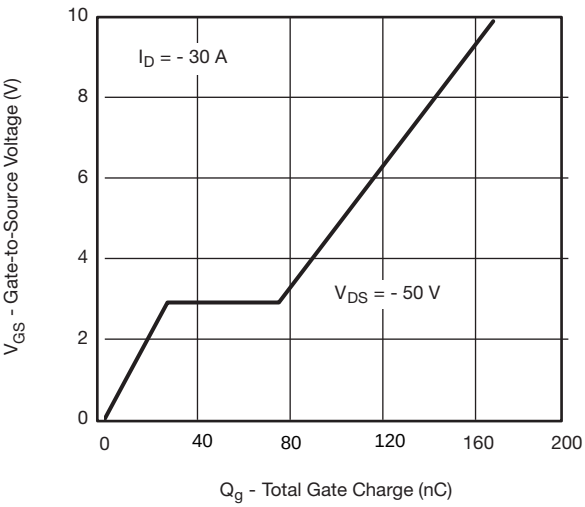
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage

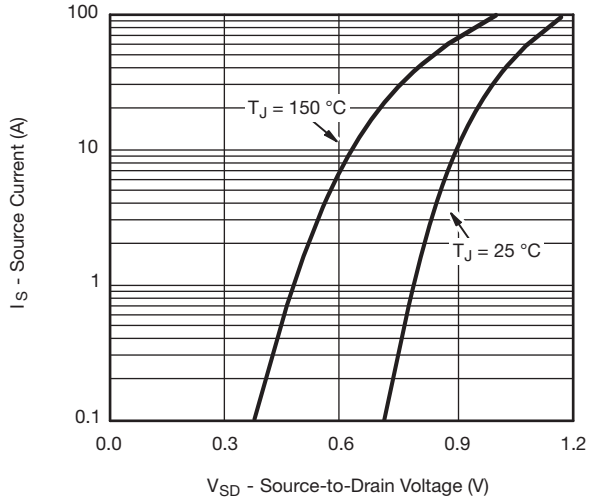


Transconductance

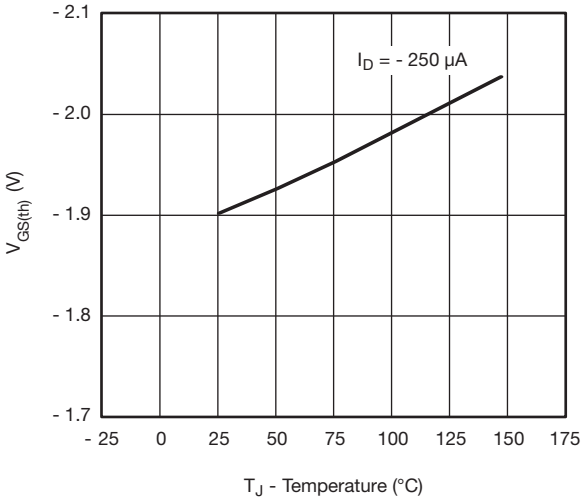


Gate Charge

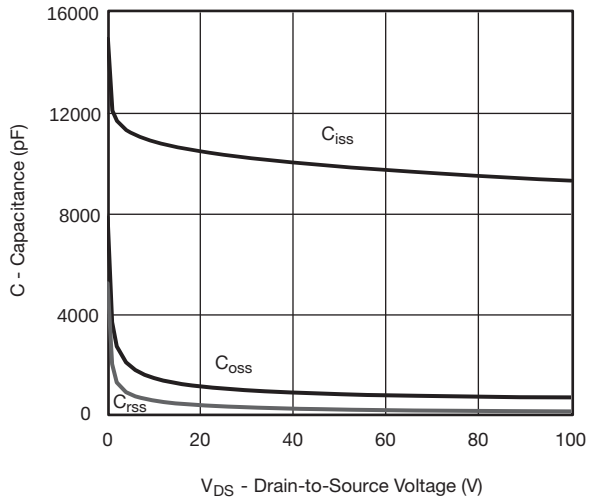
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



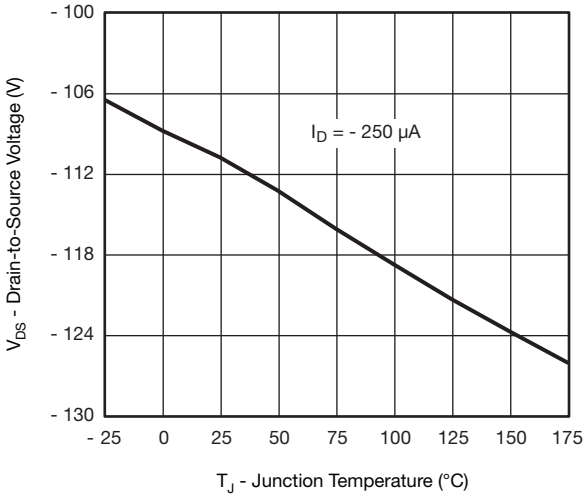
Source-Drain Diode Forward Voltage



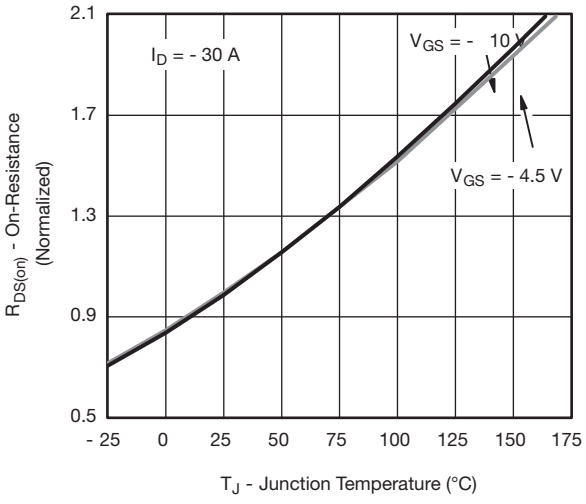
Threshold Voltage



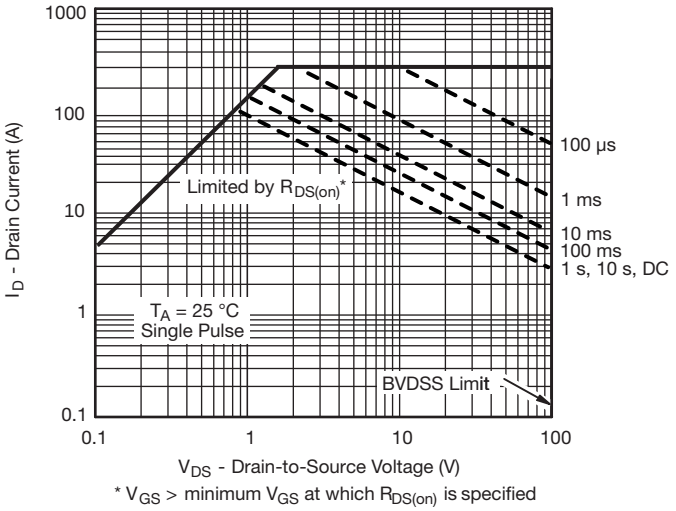
Capacitance



Drain Source Breakdown vs. Junction Temperature



On-Resistance vs. Junction Temperature



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

Safe Operating Area

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