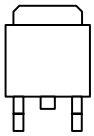
N-Channel 30-V (D-S), 175°C MOSFET, Logic Level

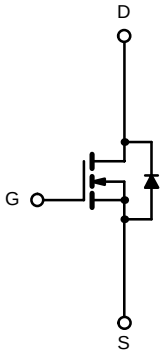
PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$R_{DS(ON)}$ (Ω)	I_D (A)[A]
30	0.01 @ V_{GS} = 10 V	60

175°C Rated
Maximum Junction Temperature

TO-263



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	60	A
	T_C = 100°C		51	
Pulsed Drain Current		I_{DM}	240	
Continuous Source Current (Diode Conduction)		I_S	60	
Avalanche Current[B]		I_{AR}	60	
Repetitive Avalanche Energy[B]	L = 0.1 mH	E_{AS}	180	mJ
	L = 0.05 mH	E_{AR}	90	
Maximum Power Dissipation	T_C = 25°C	P_D	125	W
	T_C = 100°C		62[A]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 175	°C
Lead Temperature ($^1/_{16}$" from case for 10 sec.)		T_L	300	

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Maximum Junction-to-Ambient	R_{thJA}	80	°C/W
Maximum Junction-to-Case	R_{thJC}	1.2	

Notes:
A. Package Limited
B. Duty Cycle ≤ 1%

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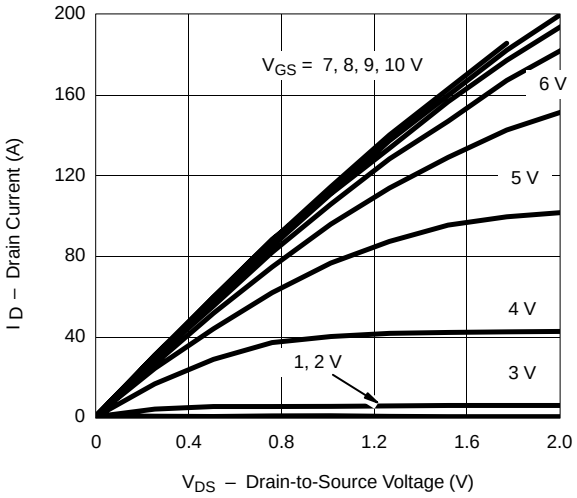
SPECIFICATIONS (T_J =25°C UNLESS OTHERWISE NOTED)						
PARAMETER	**SYMBOL**	**TEST CONDITION**	**MIN**	**TYP[A]**	**MAX**	**UNIT**
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	0.8		3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±500	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			25	μA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 125°C			250	
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 175°C			500	
On-State Drain Current[B]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 10V	60			A
Drain-Source On-State Resistance[B]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 30 A		0.007	0.01	Ω
		V_{GS} = 10 V, I_D = 30 A, T_J = 125°C		0.009	0.016	
		V_{GS} = 10 V, I_D = 30 A, T_J = 175°C			0.020	
		V_{GS} = 5 V, I_D = 30 A		0.010	0.015	
Forward Transconductance[B]	g_{fs}	V_{DS} = 15 V, I_D = 30 A		44		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2600		pF
Output Capacitance	C_{oss}			1500		
Reverse Transfer Capacitance	C_{rss}			750		
Total Gate Charge[C]	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 60 A		100	120	nC
Gate-Source Charge[C]	Q_{gs}			10	15	
Gate-Drain Charge[C]	Q_{gd}			45	75	
Turn-On Delay Time[C]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 1 Ω I_D ≅ 30 A, V_{GEN} = 10 V, R_G = 2.5 Ω		14	30	ns
Rise Time[C]	t_r			25	50	
Turn-Off Delay Time[C]	$t_{d(off)}$			65	100	
Fall Time[C]	t_f			45	80	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25°C)						
Pulsed Current	I_{SM}				240	A
Diode Forward Voltage	V_{SD}	I_S = I_F = 60 A, V_{GS} = 0 V			1.6	V
Reverse Recovery Time	t_{rr}	I_F = 60 A, di/dt = 100 A/μs		160		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			13		A
Reverse Recovery Charge	Q_{rr}			1.0		μC

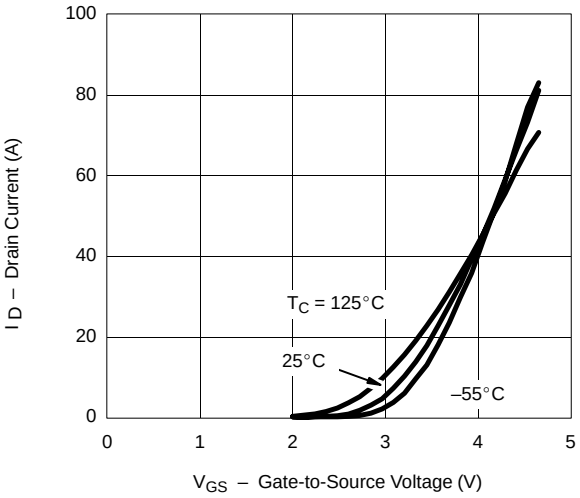
Notes:
A. For design aid only; not subject to production testing.
B. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
C. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

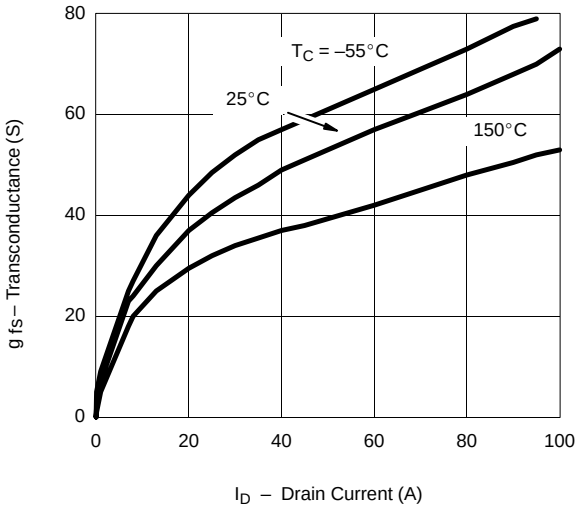
Output Characteristics



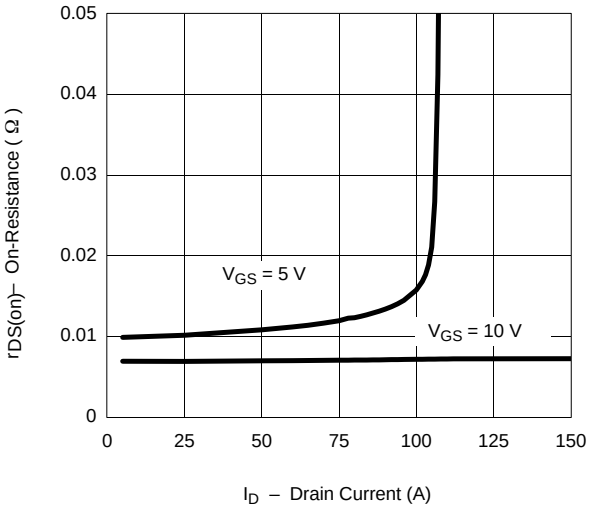
Transfer Characteristics



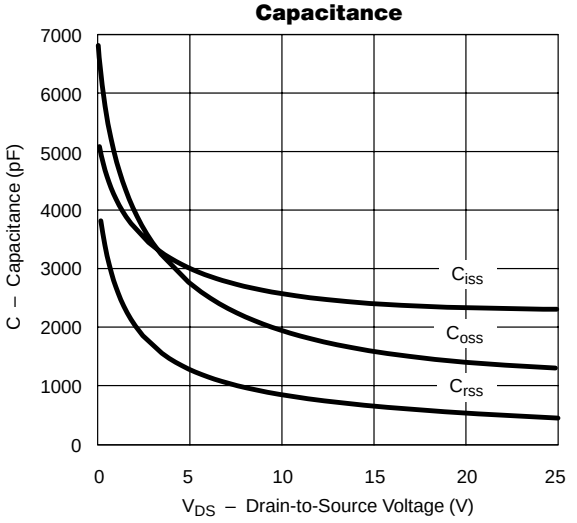
Transconductance



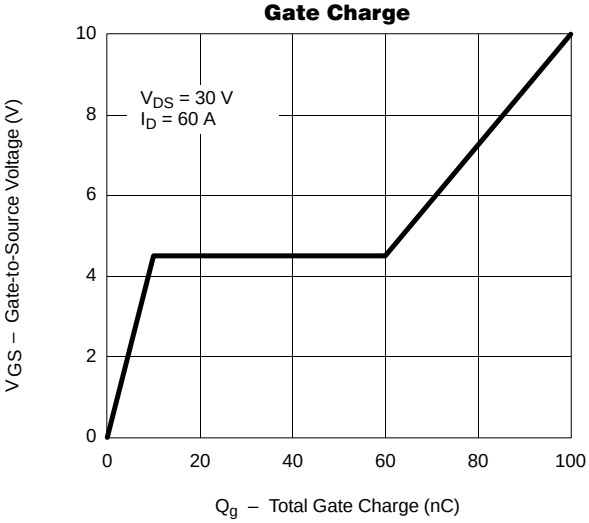
On-Resistance vs. Drain Current



Capacitance

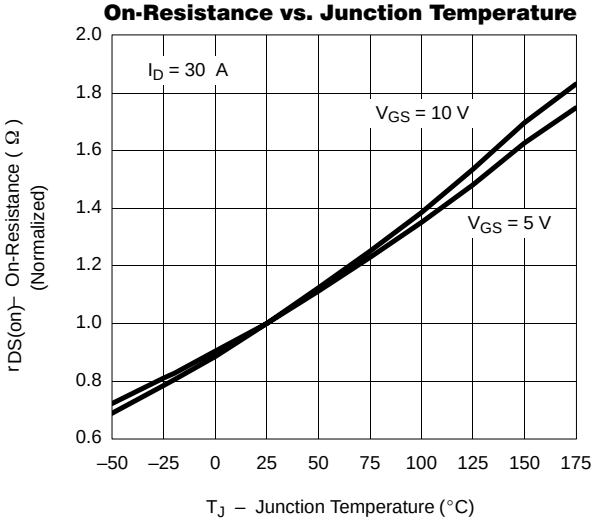


Gate Charge

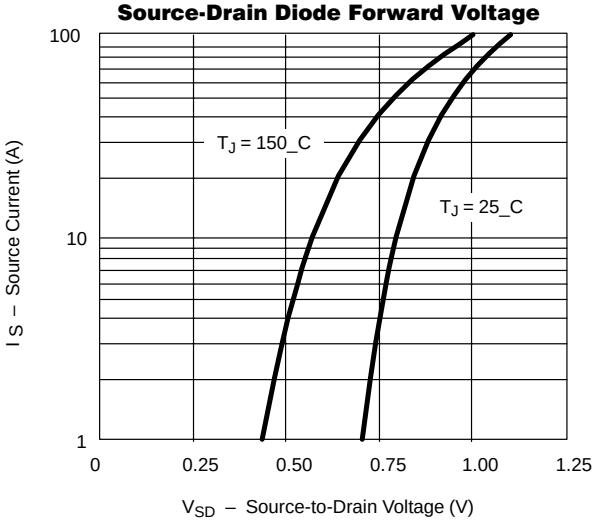


Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

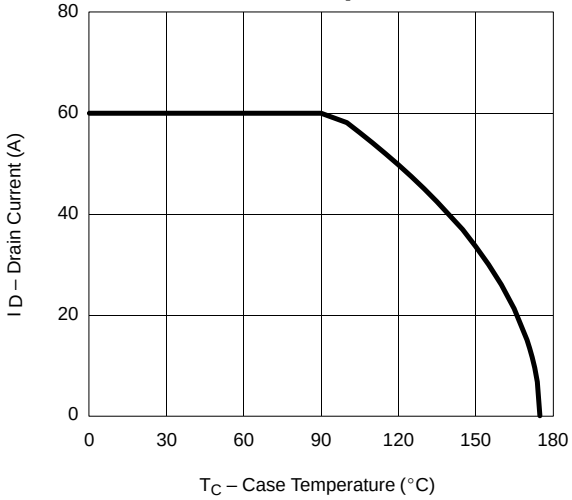


Source-Drain Diode Forward Voltage

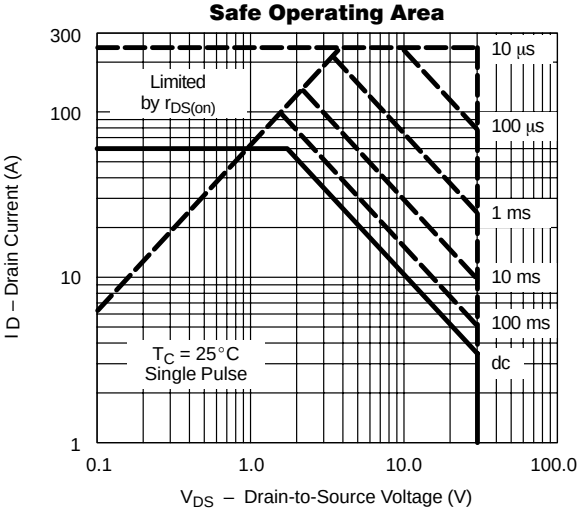


Thermal Ratings

Maximum Avalanche andDrain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case