P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) [d]
-60	0.0037 at V_{GS} = -10 V	-140
	0.0046 at V_{GS} = -4.5 V	

FEATURES

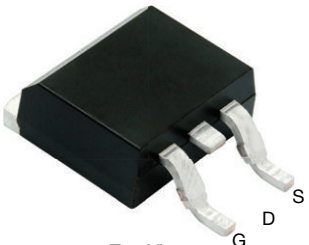
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested

RoHS COMPLIANT

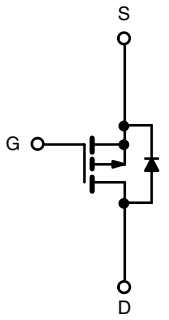
APPLICATIONS

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

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}	-60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current [d] (T_J = 175 °C)	T_C = 25 °C	I_D	-140	A
	T_C = 125 °C		-89	
Pulsed Drain Current		I_{DM}	-550	
Avalanche Current	L = 0.1 mH	I_{AS}	-108	
Single Pulse Avalanche Energy [a]		E_{AS}	505	mJ
Power Dissipation	T_C = 25 °C [c]	P_D	195	W
	T_A = 25 °C [b]		4.37	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	TYPICAL	UNIT
Junction-to-Ambient	PCB mount [b]	R_{thJA}	40	°C/W
Junction-to-Case		R_{thJC}	0.4	

Notes

a. Duty cycle ≤ 1 %.
b. When mounted on 1" square PCB (FR4 material).
c. See SOA curve for voltage derating.
d. Limited by package.

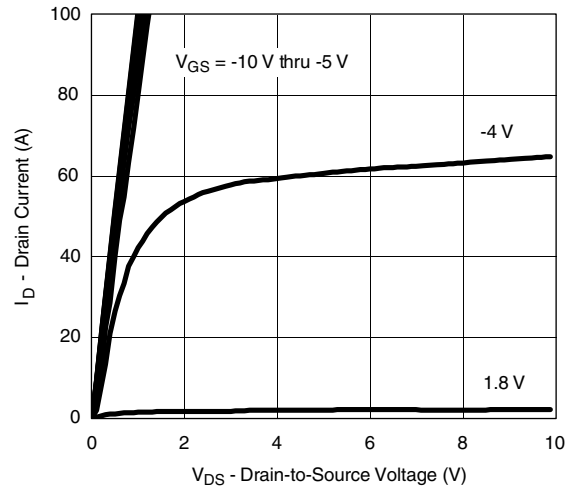
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = -250 µA	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-1	-	-3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -60 V, V_{GS} = 0 V	-	-	-1	µA
		V_{DS} = -48 V, V_{GS} = 0 V, T_J = 125 °C	-	-	-10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -10 V	-140	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -50 A	-	0.0037	0.0046	Ω
		V_{GS} = -4.5 V, I_D = -25 A	-	0.0046	0.0062	
Forward Transconductance [a]	g_{fs}	V_{DS} = -15 V, I_D = -10 A	-	20	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = -30 V, f = 1 MHz	-	18800	-	pF
Output Capacitance	C_{oss}		-	1750	-	
Reverse Transfer Capacitance	C_{rss}		-	725	-	
Total Gate Charge [c]	Q_g	V_{DS} = -30 V, V_{GS} = -10 V, I_D = -10 A	-	230	545	nC
Gate-Source Charge [c]	Q_{gs}		-	50	-	
Gate-Drain Charge [c]	Q_{gd}		-	25	-	
Gate Resistance	R_g	f = 1 MHz	-	3	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = -30 V, R_L = 0.27 Ω $I_D \cong$ -110 A, V_{GEN} = -10 V, R_g = 1 Ω	-	81	125	ns
Rise Time [c]	t_r		-	242	381	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	510	703	
Fall Time [c]	t_f		-	240	362	
Drain-Source Body Diode Characteristics (T_C = 25 °C [b])						
Continuous Current	I_S		-	-	-140	A
Pulsed Current	I_{SM}		-	-	-550	
Forward Voltage [a]	V_{SD}	I_F = -85 A, V_{GS} = 0 V	-	-0.7	-1.2	V
Reverse Recovery Time	t_{rr}	I_F = -85 A, dI/dt = 100 A/µs	-	41	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.21	0.44	µC

Notes

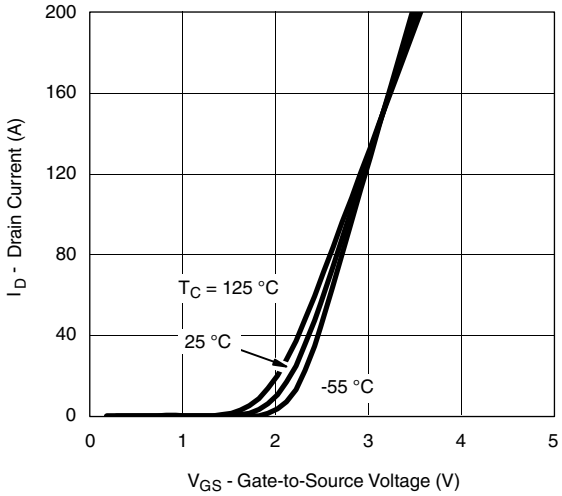
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

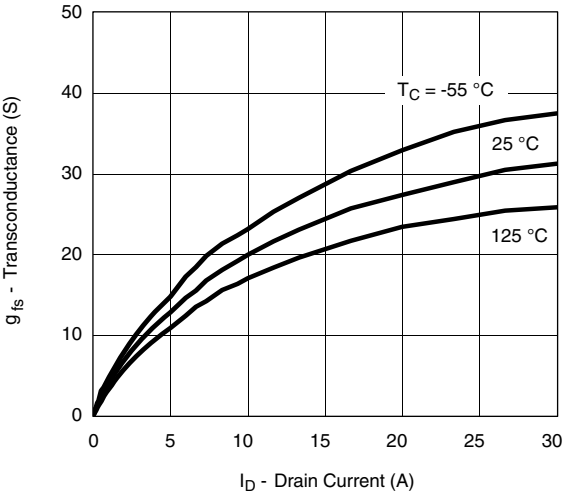
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



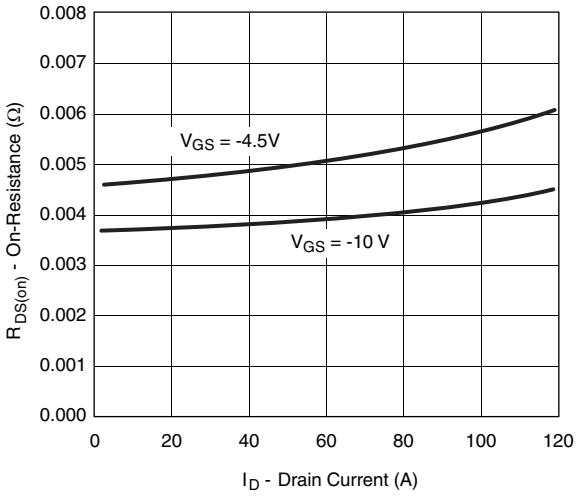
Output Characteristics



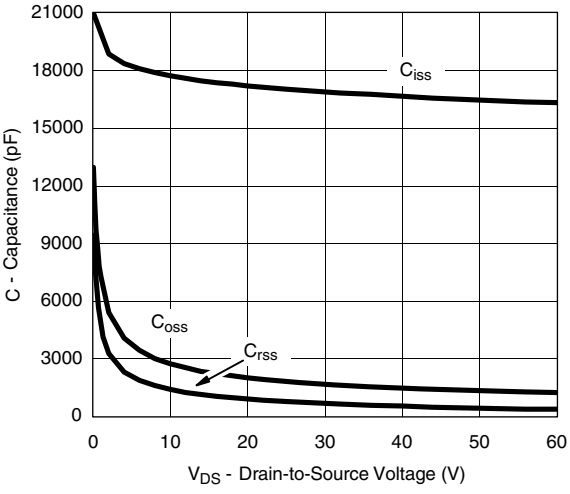
Transfer Characteristics



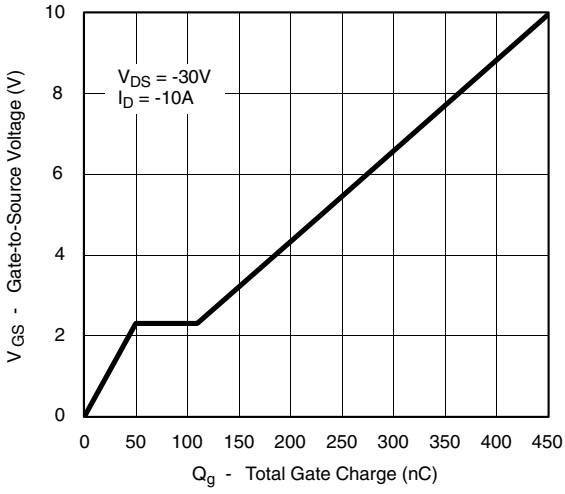
Transconductance



On-Resistance vs. Drain Current

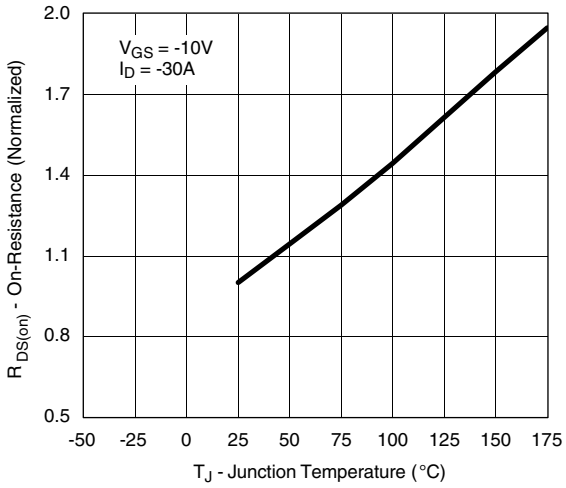


Capacitance

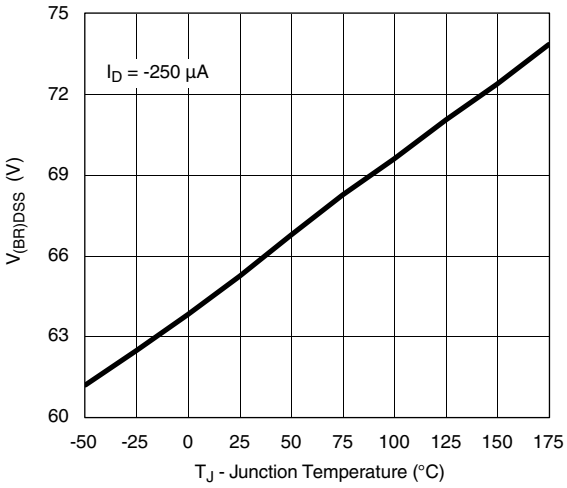


Gate Charge

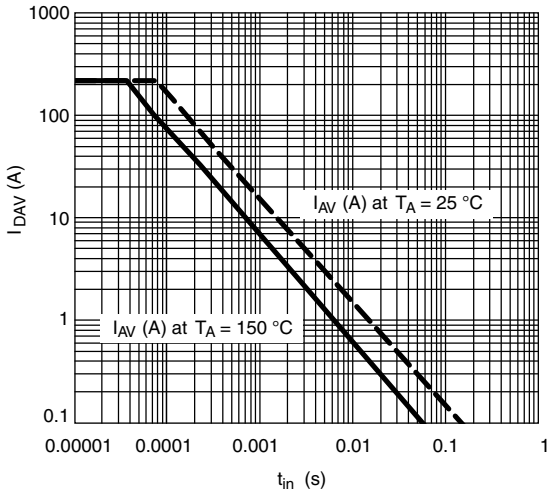
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



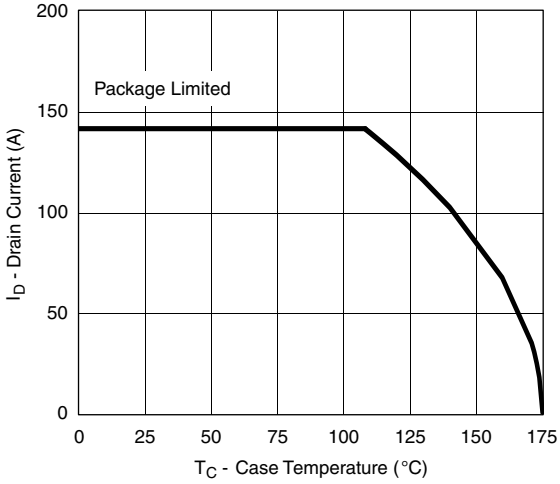
On-Resistance vs. Junction Temperature



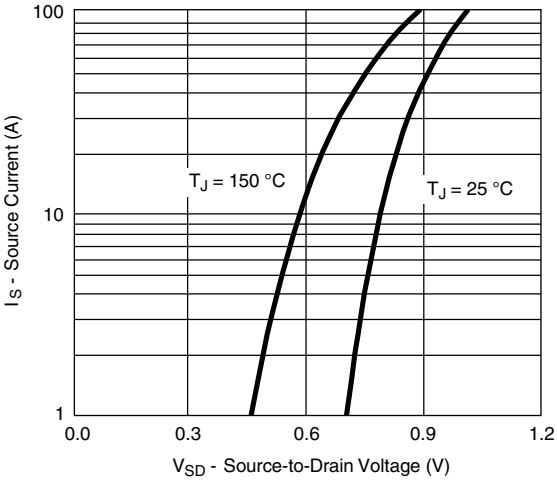
Drain Source Breakdown vs. Junction Temperature



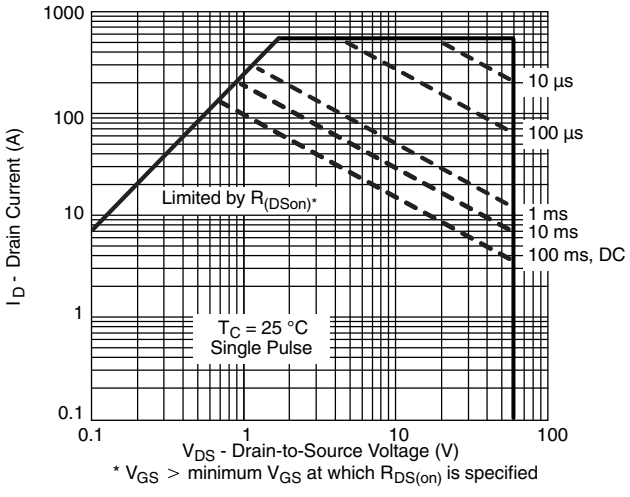
Avalanche Current vs. Time



Maximum Avalanche and Drain Current vs. Case Temperature

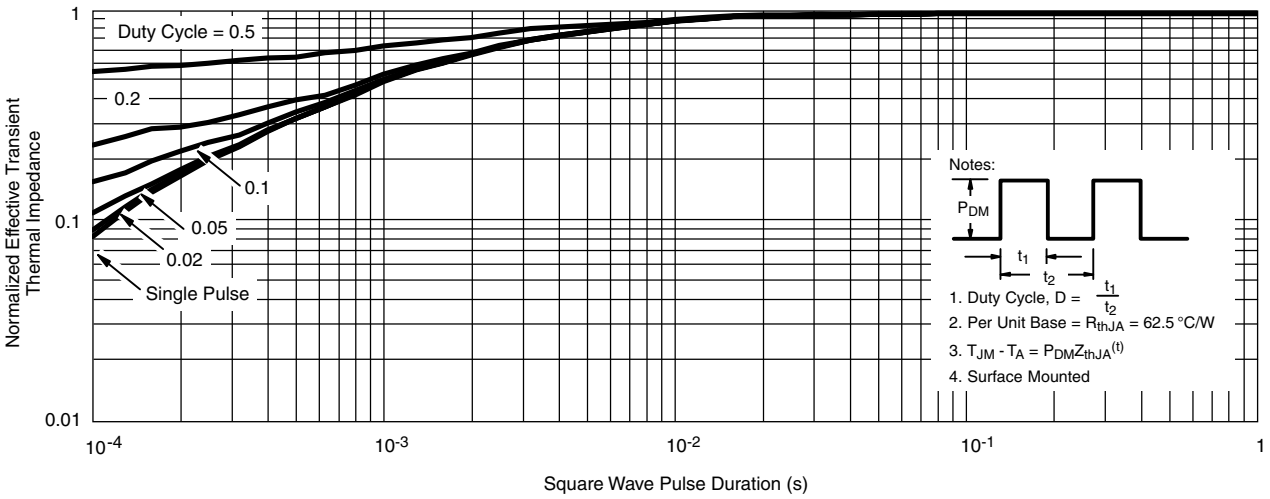


Source-Drain Diode Forward Voltage



Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

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