

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

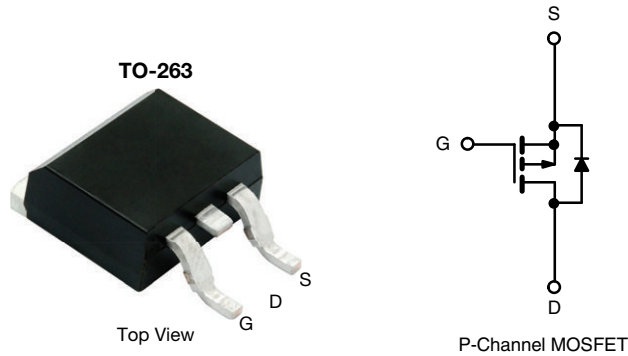
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested



RoHS
COMPLIANT

APPLICATIONS

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



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)	I _D	T _C = 25 °C	-140
		T _C = 125 °C	-89
Pulsed Drain Current	I _{DM}	-550	A
Avalanche Current	I _{AS}	-108	
Single Pulse Avalanche Energy ^a	E _{AS}	505	
Power Dissipation	P _D	T _C = 25 °C ^c	195
		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	R _{thJA}	40	°C/W
Junction-to-Case	R _{thJC}	0.4	

Notes

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

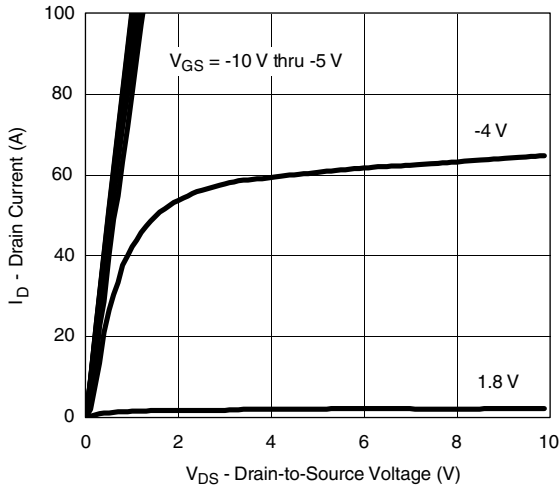
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = -250 μA	-60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1	-	-3	
Gate-Body Leakage	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 ≅ -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

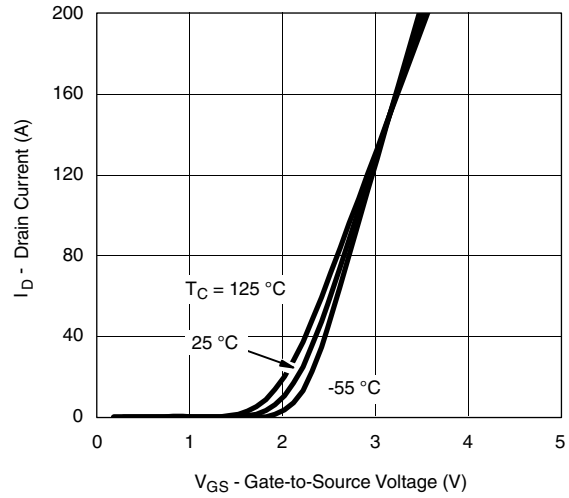
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

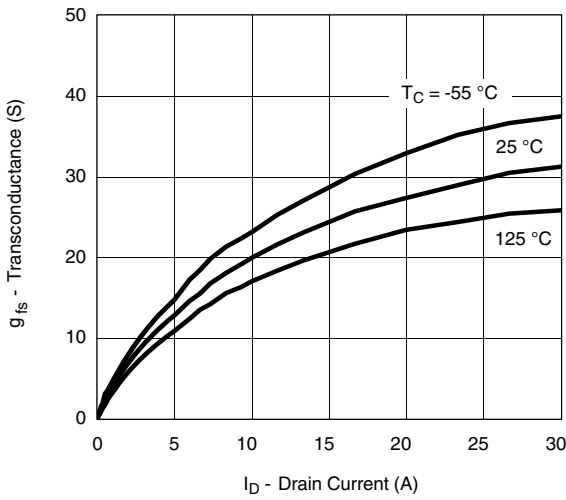
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



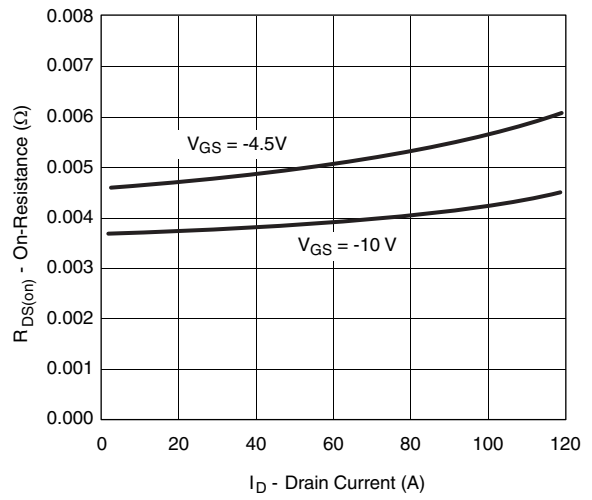
Output Characteristics



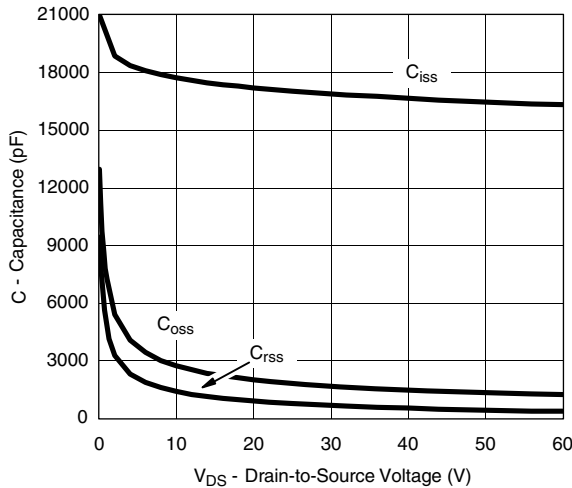
Transfer Characteristics



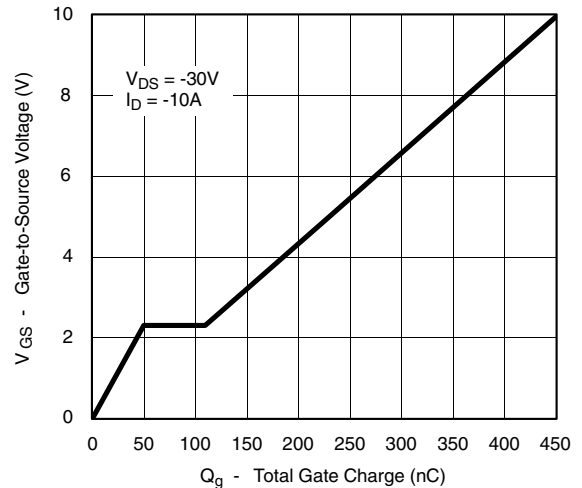
Transconductance



On-Resistance vs. Drain Current

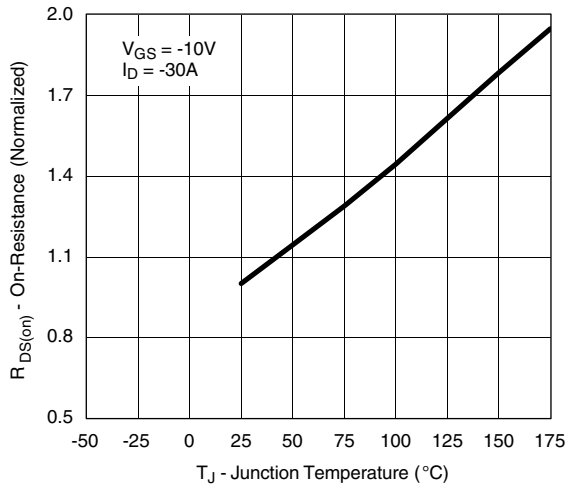


Capacitance

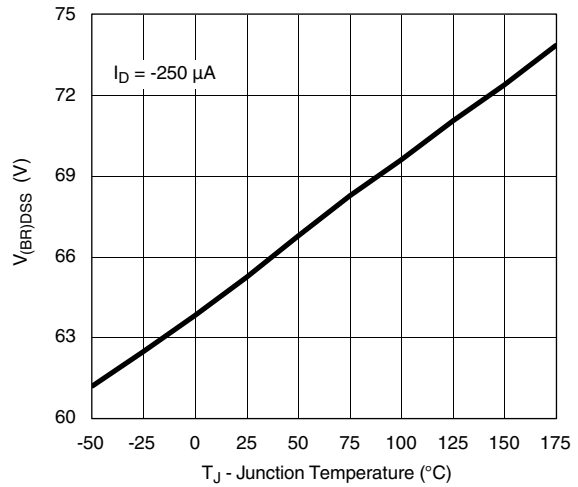


Gate Charge

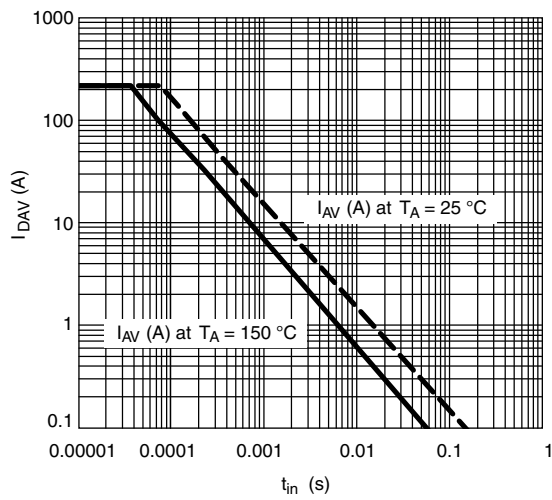
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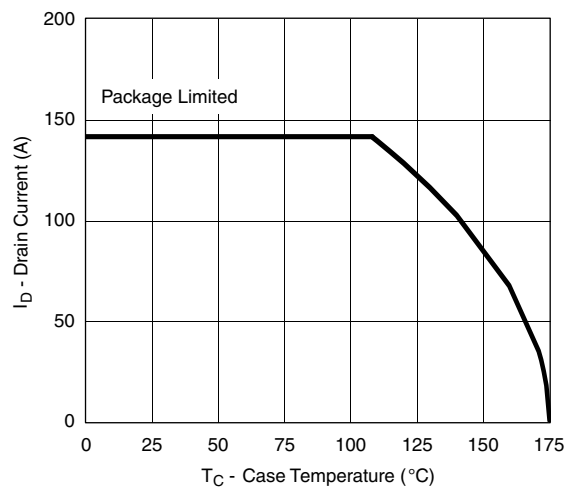
On-Resistance vs. Junction Temperature



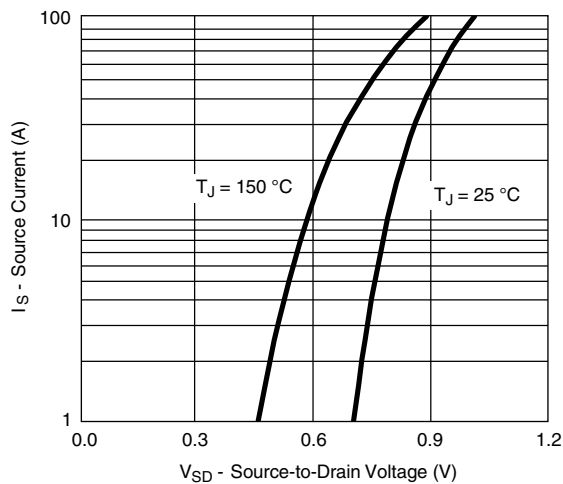
Drain Source Breakdown vs. Junction Temperature



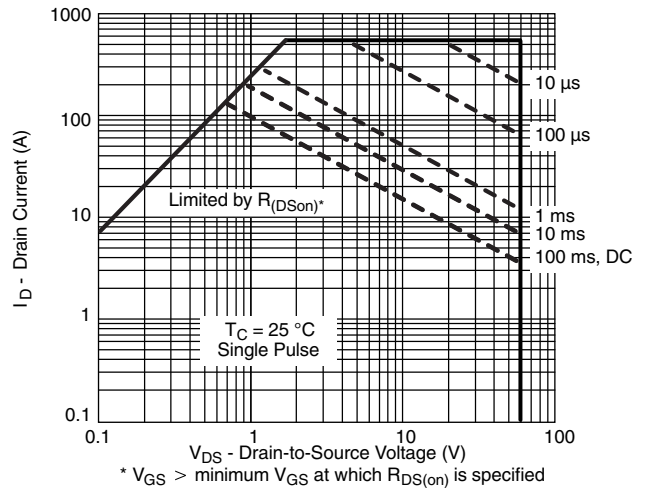
Avalanche Current vs. Time



Maximum Avalanche and Drain Current vs. Case Temperature

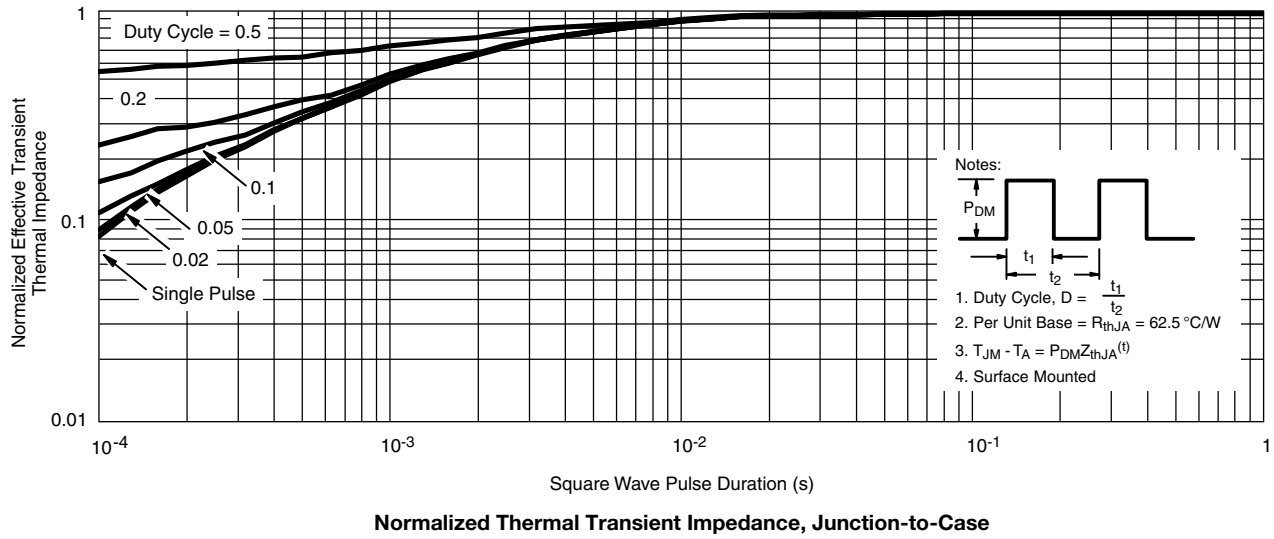


Source-Drain Diode Forward Voltage

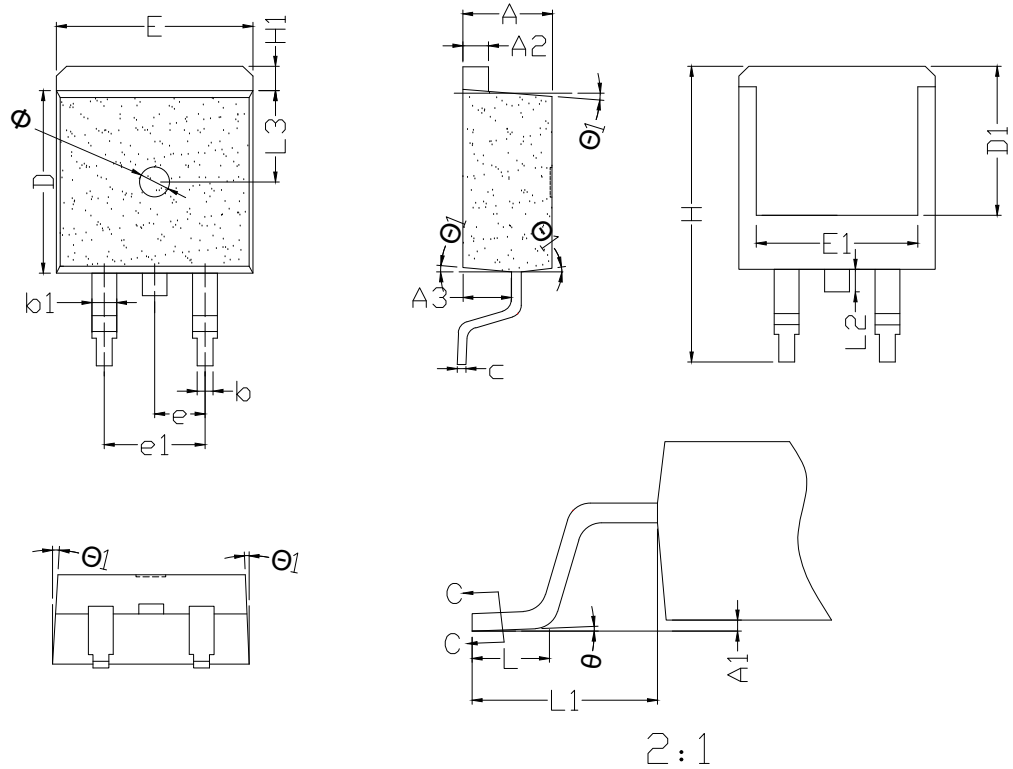


Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TO-263 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.10	4.50	4.80	e	2.35	2.54	2.75
A1	0.00	0.10	0.30	e1	5.08REF		
A2	1.10	1.30	1.50	H	14.50	15.15	16.00
A3	2.15	2.50	3.10	H1	1.00	1.28	1.75
b	0.60	0.80	1.05	L	1.80	2.23	2.90
b1	1.05	1.33	1.50	L1	4.30	4.75	5.50
c	0.33	0.50	0.66	L2	1.00	1.30	1.85
D	8.40	9.20	9.60	L3	0.90	4.65	9.00
D1	7.50REF			phi	0°	2°	5°
E	9.60	10.02	10.80	phi1	2°	-	7°
E1	7.60	9.88	10.30	Phi	1.5BSC		

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