

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

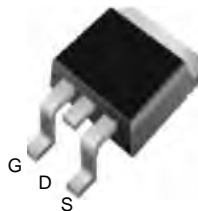
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested



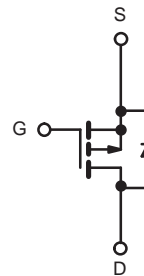
APPLICATIONS

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

**D²PAK
(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)	I _D	T _C = 25 °C	- 110	A
		T _C = 75 °C	-92	
Pulsed Drain Current	I _{DM}	- 300		
Avalanche Current	I _{AS}	- 72		
Single Avalanche Energy ^a	E _{AS}	275	mJ	
Maximum Power Dissipation ^a	P _D	T _C = 25 °C	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:

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

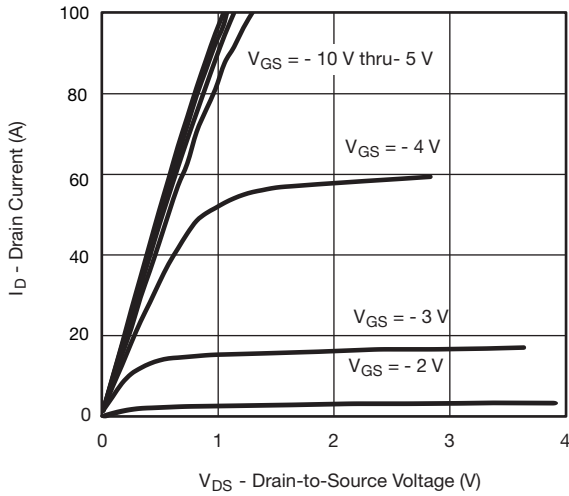
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3.0	
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}	$V_{DS} = -100\text{ V}, V_{GS} = 0\text{ V}$			- 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	$I_{D(on)}$	$V_{DS} \leq -10\text{ V}, V_{GS} = -10\text{ V}$	- 110			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		0.010	0.014	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		0.014	0.020	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		57		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -50\text{ V}, f = 1\text{ MHz}$		9450		μF
Output Capacitance	C_{oss}			1205		
Reverse Transfer Capacitance	C_{rss}			350		
Total Gate Charge ^c	Q_g	$V_{DS} = -50\text{ V}, V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		165		nC
		$V_{DS} = -50\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		130		
Gate-Source Charge ^c	Q_{gs}			43		
Gate-Drain Charge ^c	Q_{gd}			48		
Gate Resistance	R_g	$f = 1\text{ MHz}$	1.2	5.5	13.5	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -50\text{ V}, R_L = 17.2\text{ }\Omega$ $I_D \cong -30\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		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 $T_C = 25\text{ }^\circ\text{C}$ ^b						
Continuous Current	I_S				- 100	A
Pulsed Current	I_{SM}				- 300	
Forward Voltage ^a	V_{SD}	$I_F = -30\text{ A}, V_{GS} = 0\text{ V}$		- 0.7	- 1.5	V
Reverse Recovery Time	t_{rr}	$I_F = -30\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		90		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			- 7	- 12	A
Reverse Recovery Charge	Q_{rr}			390	650	nC

Notes:

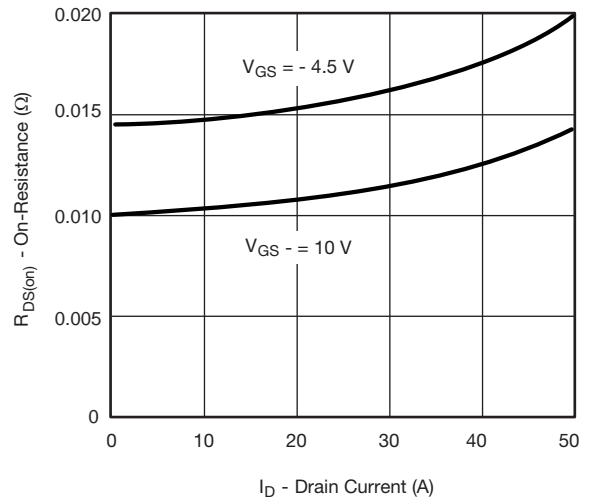
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

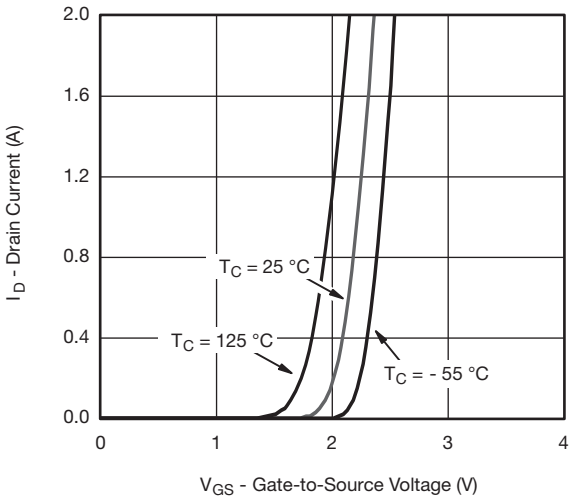
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



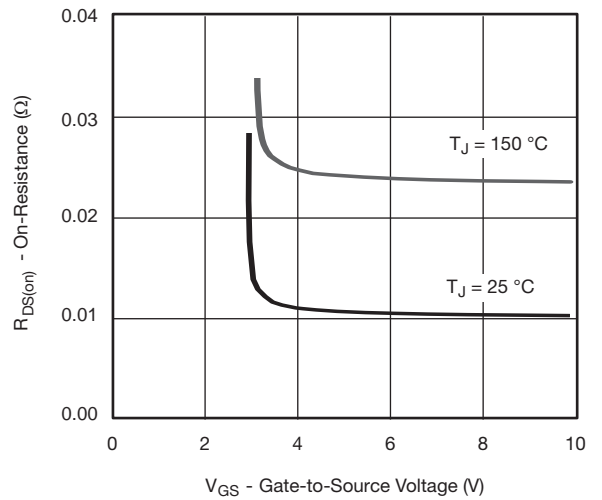
Output Characteristics



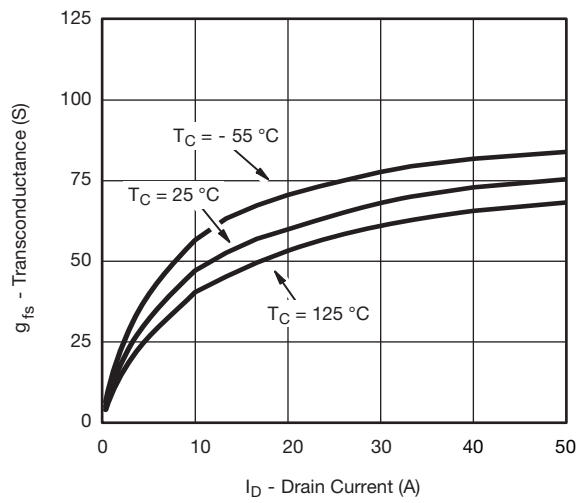
On-Resistance vs. Drain Current



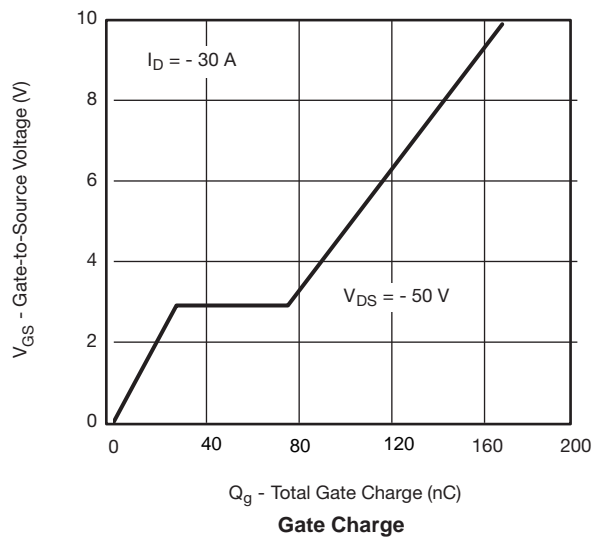
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage

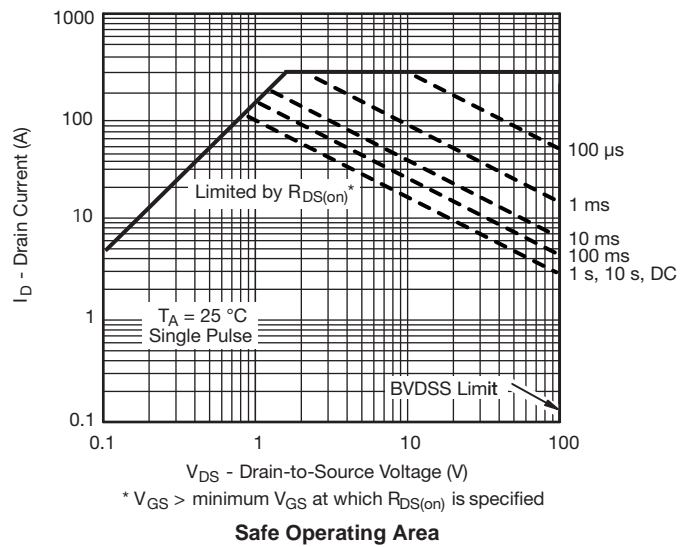
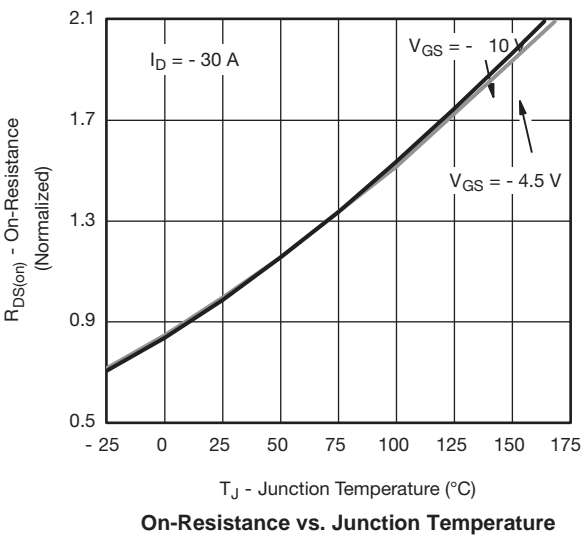
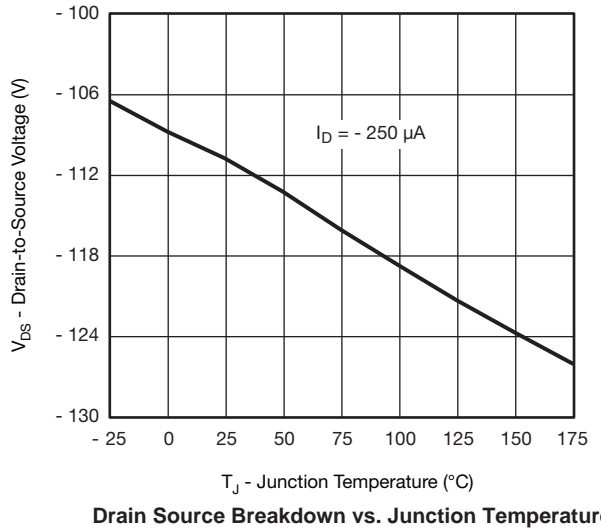
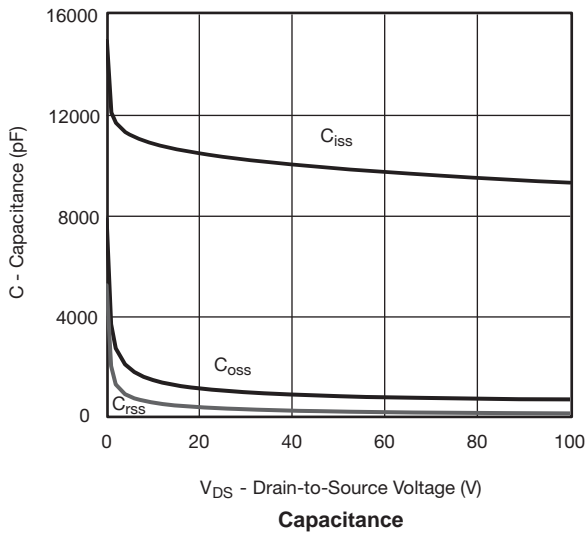
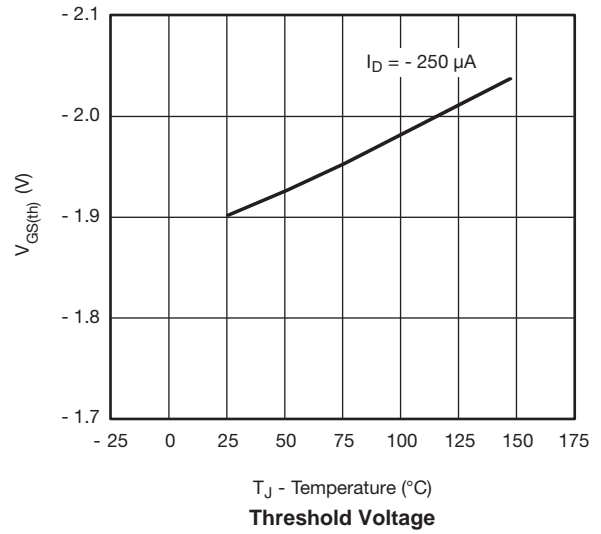
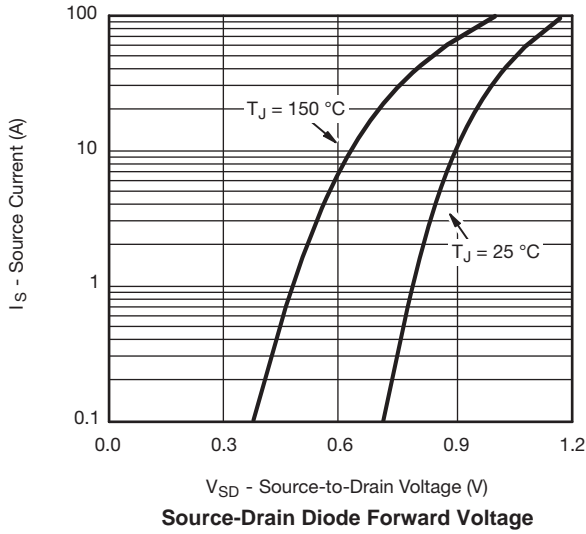


Transconductance

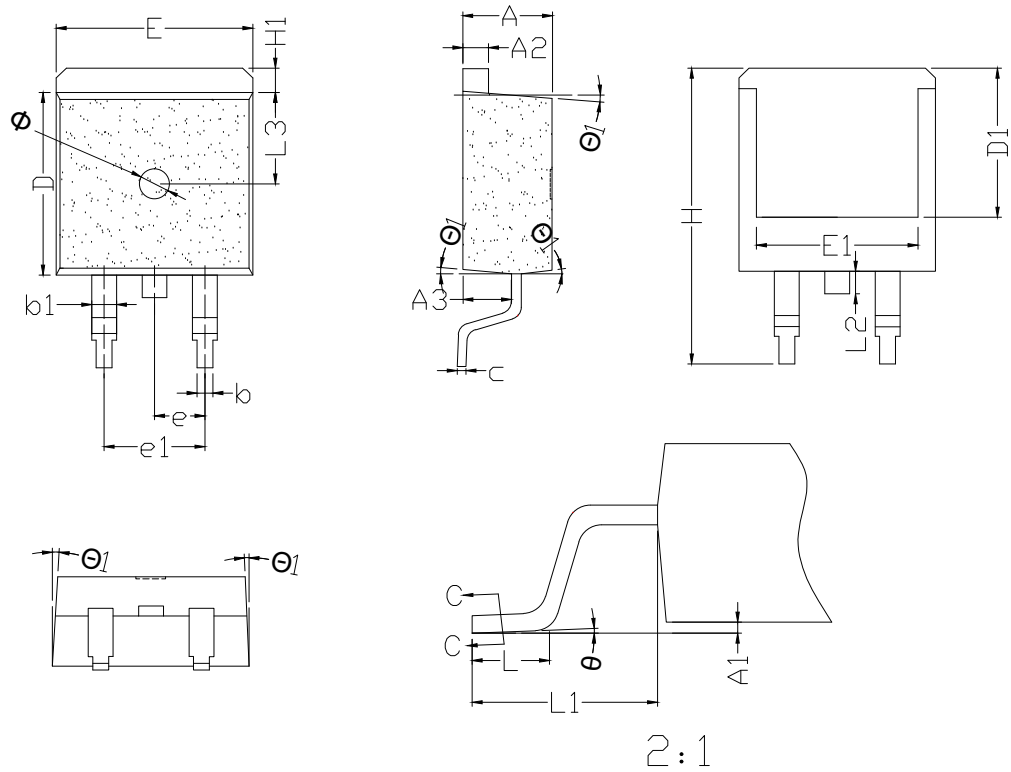


Gate Charge

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			ϕ	0°	2°	5°
E	9.60	10.02	10.80	ϕ_1	2°	-	7°
E1	7.60	9.88	10.30	Φ	1.5BSC		

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