

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (m Ω) (Typ.)	I_D (A) ^a	Q_g (Typ.)
30	9 at $V_{GS} = 4.5$ V	30	4.5 nC
	13 at $V_{GS} = 2.5$ V		

FEATURES

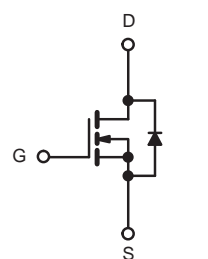
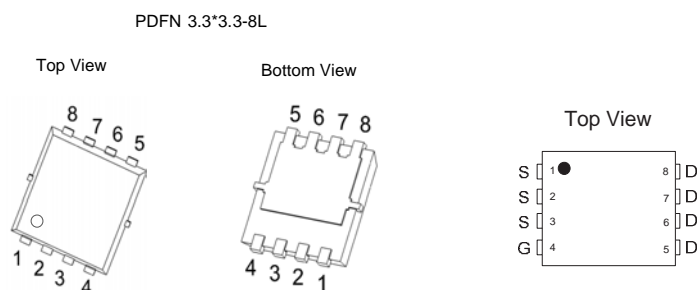
- Advanced shielded-gate technology
- Ultra-low on-resistance and gate-charge
- RoHS compliant
- 100% avalanche tested

APPLICATIONS

- Battery-driven electronic products
- DC-to-DC converters



RoHS
COMPLIANT



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}	± 10	
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_C = 25$ °C	30
		$T_C = 100$ °C	23
Pulsed Drain Current ^b	I_{DM}	120	A
Single Avalanche Energy	E_{AS}	40	mJ
Maximum Power Dissipation ^c	P_D	$T_C = 25$ °C	22
		$T_C = 100$ °C	16
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^d	R_{thJA}	62	°C/W
Junction-to-Case (Drain)	R_{thJC}	5.8	

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{thJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25$ °C.

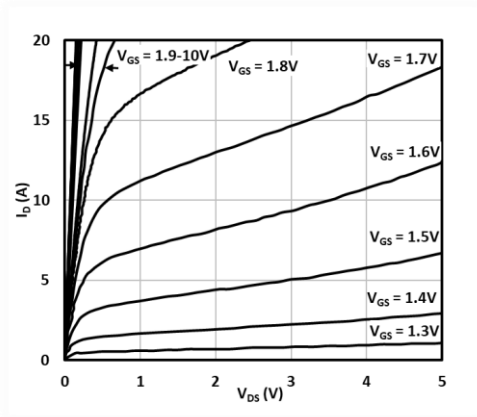
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA	30			V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.4		1.2	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 10 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 25 V, V _{GS} = 0 V			1	μA
		V _{DS} = 25 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	30			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 10 A		9	11.7	mΩ
		V _{GS} = 2.5 V, I _D = 10 A		13	17	
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 15 A		60		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		688		pF
Output Capacitance	C _{oss}			305		
Reverse Transfer Capacitance	C _{rss}			24		
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 20 A		4.5		nC
Gate-Source Charge	Q _{gs}			1.2		
Gate-Drain Charge	Q _{gd}			1.3		
Gate Resistance	R _g	f = 1 MHz		3.1		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, I _D = 15 A, R _g = 3 Ω V _{GS} = 10 V		3.5		ns
Rise Time	t _r			3		
Turn-Off Delay Time	t _{d(off)}			15		
Fall Time	t _f			3		
Drain -Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			30	A
Pulse Diode Forward Current	I _{SM}				120	
Body Diode Voltage	V _{SD}	I _S = 10 A		0.8		V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20 A, dI/dt = 100 A/μs, T _J = 25 °C		15		ns
Body Diode Reverse Recovery Charge	Q _{rr}				7	

Notes:

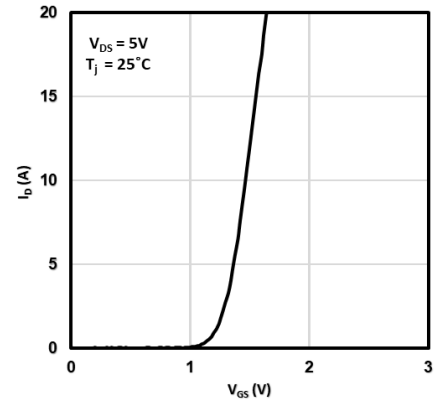
- a. Pulse test; pulse width 300 μs, duty cycle 2 %.
 b. Guaranteed by design, not subject to production testing.

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.

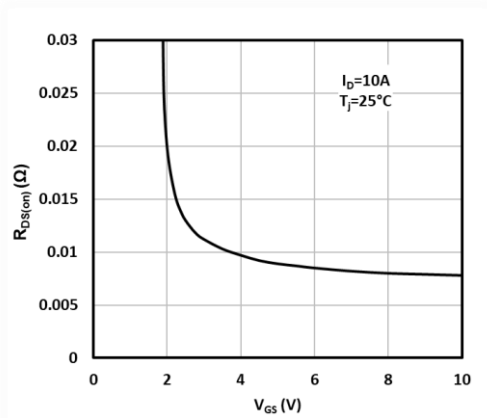
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



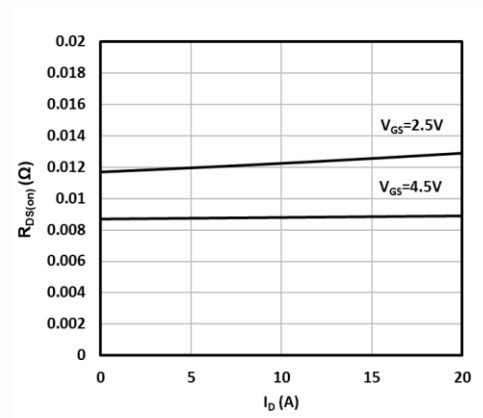
Output Characteristics



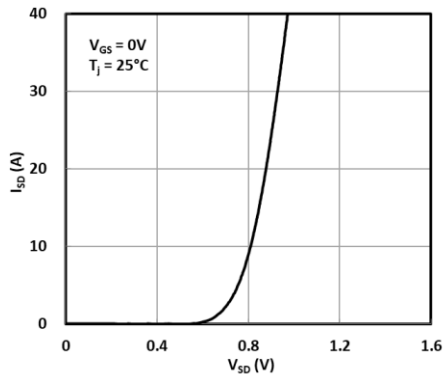
Transfer Characteristics



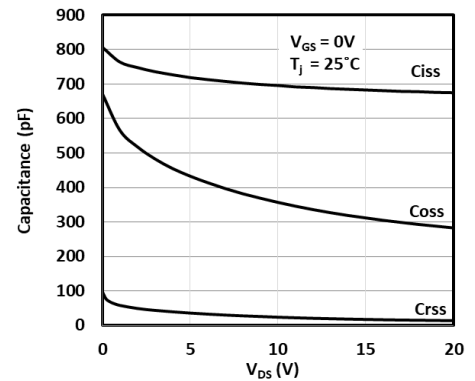
On-resistance vs. gate voltage



On-resistance vs. drain current

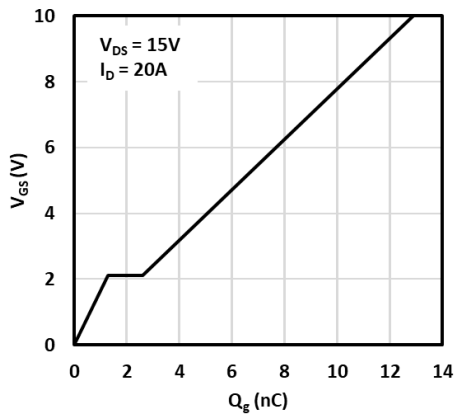


Body Diode Forward Characteristics

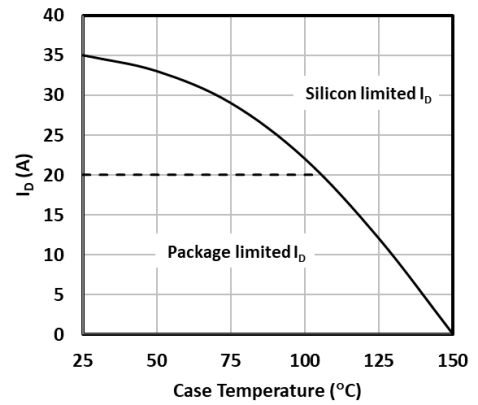


Capacitances

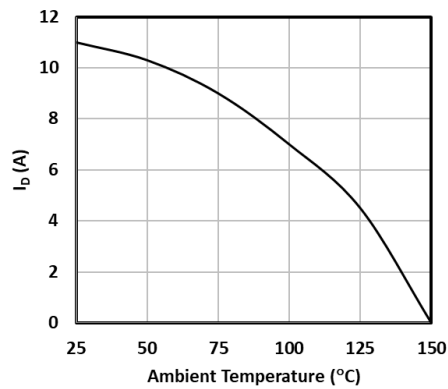
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Gate-to-source voltage vs. gate charge

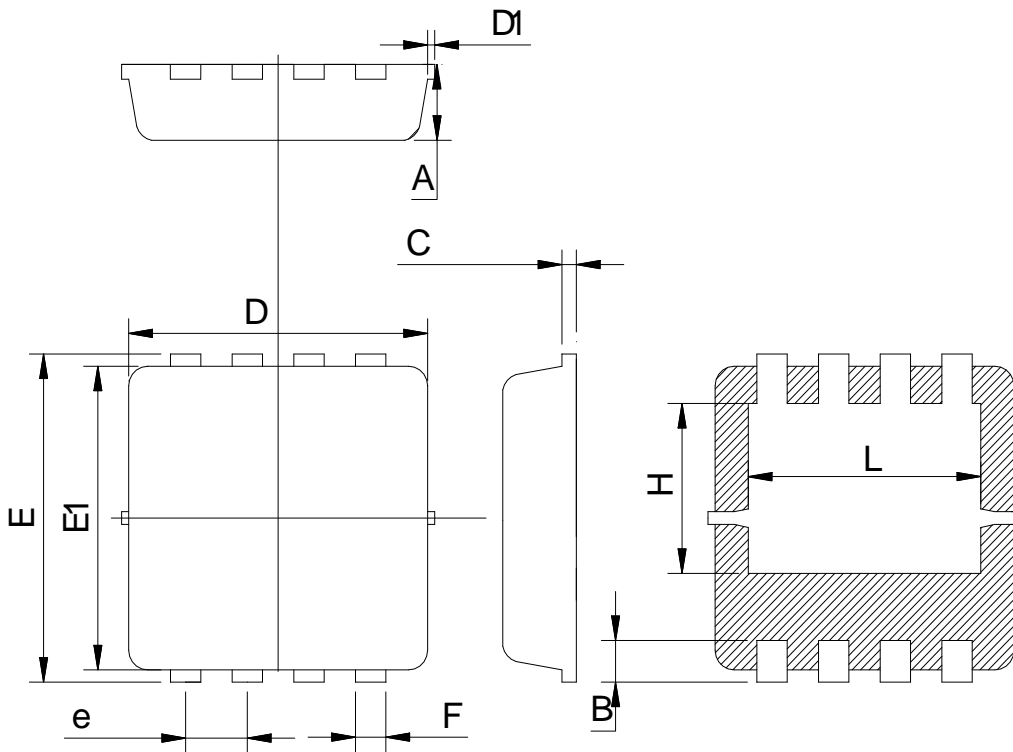


Maximum drain current vs. case temperature



Maximum drain current vs. ambient temperature

PDFN 3.3X3.3 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	0.600	0.775	1.000
B	0.20	0.38	0.55
C	0.05	0.15	0.40
D	3.10	3.25	3.50
D1	-	-	0.15
E	3.15	3.35	3.50
E1	2.60	3.10	3.45
e	0.50	0.65	0.80
F	0.15	0.32	0.45
H	1.25	1.73	2.10
L	2.20	2.45	2.85

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