

# N-Channel 25 V (D-S) MOSFET

PRODUCT SUMMARY						
V <sub>DS</sub> (V)	$R_{DS(on)}(\Omega)$	I <sub>D</sub> (A) <sup>a, e</sup>	Q <sub>g</sub> (Typ.)			
25	0.0013 at V <sub>GS</sub> = 10 V	80	70 nC			
25	0.0018 at V <sub>GS</sub> = 4.5 V	65	70110			

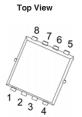
#### **FEATURES**

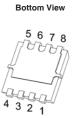
- DT-Trench Power MOSFET
- 100 % R<sub>g</sub> and UIS Tested

#### **APPLICATIONS**

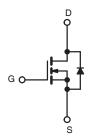
- · Notebook PC Core
- VRM/POL

#### PDFN 3.3x3.3









N-Channel MOSFET

ABSOLUTE MAXIMUM RATING	<b>S</b> (T <sub>A</sub> = 25 °C, unle	ess otherwise no	oted)		
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	25	V		
Gate-Source Voltage		V <sub>GS</sub>	± 12	<u> </u>	
	T <sub>C</sub> = 25 °C		80 <sup>a, e</sup>		
Continuous Drain Current (T,J = 175 °C)	T <sub>C</sub> = 70 °C		65 <sup>e</sup>	7	
Continuous Diam Curient (1) = 175 C)	T <sub>A</sub> = 25 °C	l <sub>D</sub> _	41 <sup>b, c</sup>	A	
	T <sub>A</sub> = 70 °C		33 <sup>b, c</sup>		
Pulsed Drain Current		I <sub>DM</sub>	320	_	
valanche Current Pulse		I <sub>AS</sub>	72		
Single Pulse Avalanche Energy	L = 0.1 mH	E <sub>AS</sub>	105	mJ	
Continuous Source-Drain Diode Current	T <sub>C</sub> = 25 °C	I-	80 <sup>a, e</sup>	A	
Commuous Source-Diam Diode Current	T <sub>A</sub> = 25 °C	l <sub>S</sub> _	7.5 <sup>b, c</sup>		
	T <sub>C</sub> = 25 °C		55		
Maximum Pawar Dissination	T <sub>C</sub> = 70 °C	P <sub>D</sub>	40	W	
Maximum Power Dissipation	T <sub>A</sub> = 25 °C	' D	5.8 <sup>b, c</sup>	VV	
	T <sub>A</sub> = 70 °C		4.1 <sup>b, c</sup>	7	
Operating Junction and Storage Temperature R	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b, d</sup>	t ≤ 10 s	R <sub>thJA</sub>	22	35	°C/W
Maximum Junction-to-Case	Steady State	R <sub>thJC</sub>	2.4	4	G/ <b>VV</b>

- Notes:
  a. Based on T<sub>C</sub> = 25 °C.
  b. Surface mounted on 1" x 1" FR4 board.
  c. t = 10 s.
  d. Maximum under steady state conditions is 90 °C/W.
- e. Calculated based on maximum junction temperature. Package limitation current is 80 A.



Static   Drain-Source Breakdown Voltage   VDS   VGS = 0 V, ID = 250 μA   25   V VDS Temperature Coefficient   ΔVGS(H) TD   ID = 250 μA   25   M	<b>SPECIFICATIONS</b> ( $T_J = 25  ^{\circ}C$ , Parameter	Symbol	Test Conditions	Min .	Тур.	Max.	Unit	
V <sub>DS</sub> Temperature Coefficient         Δ/V <sub>DS/TJ</sub> V <sub>SS(B)</sub> , Temperature Coefficient         Δ/V <sub>DS(B)</sub> /T <sub>J</sub> Sales-Source Threshold Voltage         4/V <sub>SS(B)</sub> /V <sub>SS(B)</sub> 1 <sub>DS</sub> = 250 μA         35         m/V/Y <sub>DS</sub> = 150 μA           Gate-Source Threshold Voltage         V <sub>SS(B)</sub> /V <sub>SS</sub> V <sub>DS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 μA         0.5         2.5         V           Zero Gate Voltage Drain Current         I <sub>DSS</sub> V <sub>DS</sub> = V <sub>D</sub> , V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 0 V         1         μA           On-State Drain Current <sup>8</sup> I <sub>D(D)</sub> V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 0 V         80         A           Drain-Source On-State Resistance <sup>8</sup> P <sub>DS</sub> (On)         V <sub>DS</sub> = 10 V, I <sub>D</sub> = 15 A         0.0013         0.0021           Drain-Source On-State Resistance <sup>8</sup> P <sub>DS</sub> (On)         V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 0 V, I <sub>D</sub> = 15 A         0.0013         0.0021           Porward Transconductance <sup>8</sup> 9 <sub>fs</sub> V <sub>DS</sub> = 20 V, I <sub>D</sub> = 15 A         140         S           Dynamic <sup>b</sup> V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 10 V, I <sub>D</sub> = 15 A         140         S           Oypacitance         C <sub>DSS</sub> V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 10 V, I <sub>D</sub> = 15 A         70         10           Gate-Source Charge         Q <sub>Dg</sub> V <sub>DS</sub> = 20 V, V <sub>DS</sub> = 10 V, I <sub>D</sub> = 15 A         70         10         10         10         10         10         10         10	Static	7			-76-	1114111		
Vag(m) Temperature Coefficient         λVos(m)/Ty         Ip = 250 μA         - 5.5         mV/°C           Gate-Source Threshold Voltage         Vgs(m)         Vgs(m)         Vgs = 250 μA         0.5         2.5         V           Gate-Source Leakage         Igss         Vgs = 0 V, Vgs = 20 V         ± 100         nA           Zero Gate Voltage Drain Current         Igss         Vgs = 20 V, Vgs = 0 V         ± 100         nA           On-State Drain Current <sup>a</sup> Igo(m)         Vgs = 20 V, Vgs = 0 V         ± 100         nA           On-State Drain Current <sup>a</sup> Igo(m)         Vgs = 20 V, Vgs = 10 V         80         A           Orain-Source On-State Resistance <sup>a</sup> Pgs         Vgs = 10 V, Ip = 15 A         0.0013         0.0021           Forward Transconductance <sup>a</sup> 9gs         Vgs = 20 V, Ip = 15 A         0.0018         0.0028           Forward Transconductance <sup>a</sup> 9gs         Vgs = 20 V, Ip = 15 A         140         s           Dynamic <sup>b</sup> Vgs = 20 V, Vgs = 10 V, Ip = 15 A         140         s         s           Dynamic <sup>b</sup> Vgs = 20 V, Vgs = 10 V, Ip = 15 A         70         ygs         ygs         ygs         3800         ygs         ygs         ygs         ygs         ygs         ygs <td< td=""><td>Drain-Source Breakdown Voltage</td><td>V<sub>DS</sub></td><td><math>V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}</math></td><td>25</td><td></td><td></td><td>V</td></td<>	Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	25			V	
Vosythy Temperature Coefficient         Δ/GS(H)/I (SIGN)         VDS = VGS, ID = 250 μA         0.5         2.5         VDS           Gate-Source Threshold Voltage         VGS(H)         VDS = 0 V, VGS = 20 V         ± 100         nA           Zero Gate Voltage Drain Current         IDSS         VDS = 20 V, VGS = 0 V         1         μA           On-State Drain Current <sup>a</sup> ID(m)         VDS = 20 V, VGS = 10 V         80         A           On-State Drain Current <sup>a</sup> ID(m)         VDS = 50 V, VGS = 10 V         80         A           Drain-Source On-State Resistance <sup>a</sup> RDS(m)         VGS = 10 V, ID = 15 A         0.0018         0.0028           Forward Transconductance <sup>a</sup> GB IS         VDS = 20 V, ID = 15 A         0.0018         0.0028           Portain-Source Constate Resistance <sup>a</sup> GB IS         VDS = 20 V, ID = 15 A         0.0018         0.0028           Portain-Source Constance         CG IS         VDS = 20 V, VGS = 0 V, ID = 15 A         140         S           Pypramicb         VDS = 20 V, VGS = 10 V, ID = 15 A         70         0         0           Output Capacitance         CG IS         VDS = 20 V, VGS = 10 V, ID = 15 A         70         0         0         0         0         0         0         0         0         <	V <sub>DS</sub> Temperature Coefficient	$\Delta V_{DS}/T_{J}$	1 050 4		35		1.1/2.5	
Gate-Source Leakage   IGSS   VDS = 0 V, VGS = ± 20 V   ± 100   nA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 10 V, ID = 15 A   0.0013   0.0021   0.	V <sub>GS(th)</sub> Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I <sub>D</sub> = 250 μA		- 5.5		mv/°C	
Gate-Source Leakage   IGSS   VDS = 0 V, VGS = ± 20 V   ± 100   nA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 20 V, VGS = 0 V   1   1   μA     VDS = 10 V, ID = 15 A   0.0013   0.0021   0.	Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_{D} = 250 \mu\text{A}$	0.5		2.5	V	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Gate-Source Leakage	1 .	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Con-State Drain Current®   ID(on)   V <sub>DS</sub> = 20 V, V <sub>QS</sub> = 10 V   80   A	7 0 1 1/1   10 1 0 1	I <sub>DSS</sub>	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Zero Gate Voltage Drain Current		V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			10	μA	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	80			Α	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Ь	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		0.0013	0.0021		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Drain-Source On-State Resistance <sup>a</sup>	HDS(on)			0.0018	0.0028	Ω	
Input Capacitance	Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 15 A		140		S	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Dynamic <sup>b</sup>		-					
Reverse Transfer Capacitance   C <sub>rss</sub>   90	Input Capacitance	C <sub>iss</sub>			3800			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Output Capacitance	C <sub>oss</sub>	$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		880		pF	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Reverse Transfer Capacitance	C <sub>rss</sub>			90			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T-4-1 O-4- Ob		V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		70			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	lotal Gate Charge	Q <sub>g</sub>			30		nC	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Gate-Source Charge	Q <sub>gs</sub>	$V_{DS} = 20 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 10 \text{ A}$		16			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Gate-Drain Charge	$Q_{gd}$			3.8			
Rise Time $t_r$ $V_{DD} = 20 \text{ V}, R_L = 0.555 \Omega$ 6           Turn-Off Delay Time $t_d(off)$ $I_D \cong 15 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$ 38           Fall Time $t_f$ 4.5         38           Turn-On Delay Time $t_d(on)$ 25         10           Rise Time $t_r$ $V_{DD} = 20 \text{ V}, R_L = 0.625 \Omega$ 10         10           Turn-Off Delay Time $t_d(off)$ $t_d(off)$ 45         7.2           Fall Time $t_f$ $t_f$ 7.2         45           Drain-Source Body Diode Characteristics $t_f$ $t_f$ 7.2         80           Pulse Diode Forward Current $t_f$ $t_f$ 320         A           Body Diode Voltage $t_f$ $t_f$ $t_f$ 20         ns           Body Diode Reverse Recovery Time $t_f$ $t_f$ $t_f$ 20         nc           Reverse Recovery Fall Time $t_g$	Gate Resistance	Rg	f = 1 MHz		1.0	2.1	Ω	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Turn-On Delay Time	t <sub>d(on)</sub>			12			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Rise Time	t <sub>r</sub>	$V_{DD} = 20 \text{ V}, R_{L} = 0.555 \Omega$		6			
Turn-On Delay Time $ \begin{matrix} t_{d(on)} \\ Rise Time \end{matrix} \qquad \begin{matrix} t_r \\ V_{DD} = 20 \text{ V}, R_L = 0.625 \ \Omega \\ I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} 10 \\ 45 \\ 7.2 \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \ \Omega \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ C} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ A}, V_{GEN} = 1.5 \text{ A} \end{matrix} \qquad \begin{matrix} I_D \cong 10 \text{ A}, V_{GEN} = 1.5 \text{ A} \end{matrix} \qquad \begin{matrix} $	Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong 15 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		38			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Fall Time	t <sub>f</sub>			4.5			
Turn-Off Delay Time $t_{d(off)} = t_{d(off)} = t_{d(off)$	Turn-On Delay Time	t <sub>d(on)</sub>			25		ns	
Fall Time $t_f$ 7.2  Drain-Source Body Diode Characteristics  Continuous Source-Drain Diode Current $I_S$ $T_C = 25 ^{\circ}\text{C}$ 80  Pulse Diode Forward Current <sup>a</sup> $I_{SM}$ 320  Body Diode Voltage $V_{SD}$ $I_S = 12 ^{\circ}\text{A}$ 0.8 1.2 $V_{SD}$ 80  Body Diode Reverse Recovery Time $V_{rr}$ 20 ns  Body Diode Reverse Recovery Charge $V_{rr}$ Reverse Recovery Fall Time $V_{rr}$ 20 nc  Reverse Recovery Fall Time $V_{rr}$ 20 nc	Rise Time	t <sub>r</sub>	$V_{DD} = 20 \text{ V}, R_{L} = 0.625 \Omega$		10			
Drain-Source Body Diode Characteristics         Continuous Source-Drain Diode Current $I_S$ $T_C = 25$ °C       80       A         Pulse Diode Forward Current <sup>a</sup> $I_{SM}$ 320       320         Body Diode Voltage $V_{SD}$ $I_S = 12$ A       0.8       1.2       V         Body Diode Reverse Recovery Time $t_{rr}$ 20       ns         Body Diode Reverse Recovery Charge $Q_{rr}$ $I_F = 10$ A, di/dt = 100 A/μs, $T_J = 25$ °C       20       nC         Reverse Recovery Fall Time $t_a$	Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		45			
	Fall Time	t <sub>f</sub>			7.2			
Pulse Diode Forward Current <sup>a</sup> $I_{SM}$ 320  Body Diode Voltage $V_{SD}$ $I_{S} = 12 \text{ A}$ 0.8 1.2 $V_{SD}$ 8 1.2 $V_{SD}$ Body Diode Reverse Recovery Time $V_{rr}$ 20 ns 8 1.2 $V_{rr}$ 8 Body Diode Reverse Recovery Charge $V_{rr}$ $V_{rr}$ 8 Reverse Recovery Fall Time $V_{rr}$	<b>Drain-Source Body Diode Characteristics</b>	S			•			
Pulse Diode Forward Current <sup>a</sup> $I_{SM}$ 320  Body Diode Voltage $V_{SD}$ $I_S = 12 \text{ A}$ 0.8 1.2 $V$ Body Diode Reverse Recovery Time $t_{rr}$ Body Diode Reverse Recovery Charge $Q_{rr}$ Reverse Recovery Fall Time $t_a$ $I_F = 10 \text{ A}, \text{ di/dt} = 100 \text{ A/µs}, T_J = 25 °C$ $I_F = 10 \text{ A}, \text{ di/dt} = 100 \text{ A/µs}, T_J = 25 °C$	Continuous Source-Drain Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25 °C			80	۸	
Body Diode Reverse Recovery Time $t_{rr}$ Body Diode Reverse Recovery Charge $Q_{rr}$ Reverse Recovery Fall Time $t_a$ $I_F = 10 \text{ A, di/dt} = 100 \text{ A/µs, T}_J = 25 \text{ °C}$ $59$ ns	Pulse Diode Forward Current <sup>a</sup>	I <sub>SM</sub>				320	^	
Body Diode Reverse Recovery Charge $Q_{rr}$ $I_F = 10 \text{ A}, \text{ di/dt} = 100 \text{ A/µs}, T_J = 25 °C$ $0 \text{ nC}$	Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 12 A		0.8	1.2	V	
Reverse Recovery Fall Time t <sub>a</sub> I <sub>F</sub> = 10 A, di/dt = 100 A/μs, I <sub>J</sub> = 25 °C 59 ns	Body Diode Reverse Recovery Time	t <sub>rr</sub>			20		ns	
Reverse Recovery Fall Time t <sub>a</sub> 59 ns	Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	L = 10 A di/dt = 100 A/vo T = 05 °C		20		nC	
	Reverse Recovery Fall Time	t <sub>a</sub>	$I_F = 10 \text{ A, di/dt} = 100 \text{ A/µs, } I_J = 25 °C$		59			
	Reverse Recovery Rise Time	t <sub>b</sub>			15		ns	

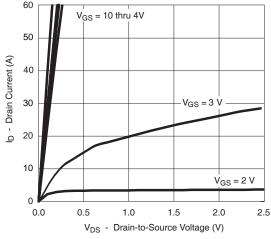
### Notes:

- a. Pulse test; pulse width  $\leq$  300  $\mu s,$  duty cycle  $\leq$  2 %. b. Guaranteed by design, not subject to production testing.

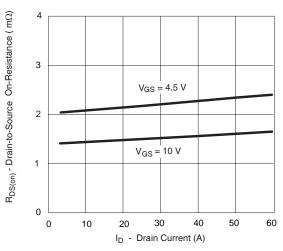
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



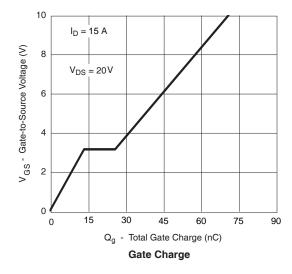
### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

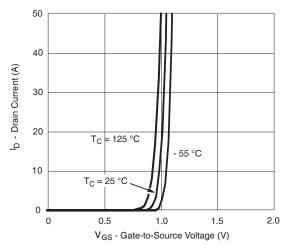


#### **Output Characteristics**

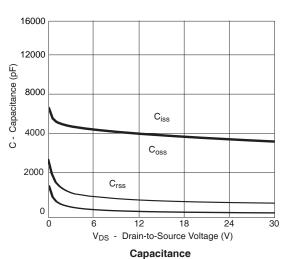


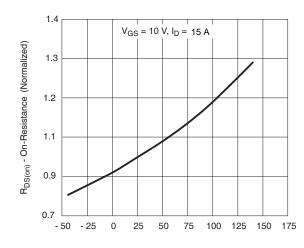
R<sub>DS(on)</sub> vs. Drain Current





**Transfer Characteristics** 

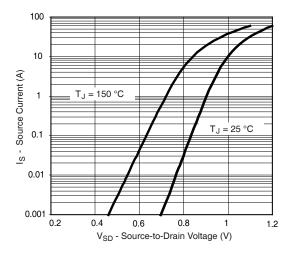




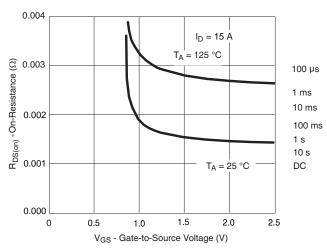
On-Resistance vs. Junction Temperature



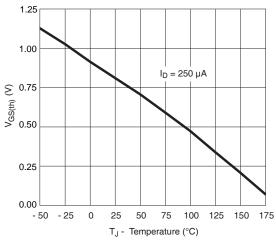
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



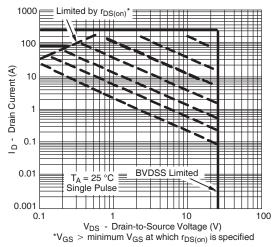
Forward Diode Voltage vs. Temperature



 $R_{DS(on)}$  vs.  $V_{GS}$  vs. Temperature

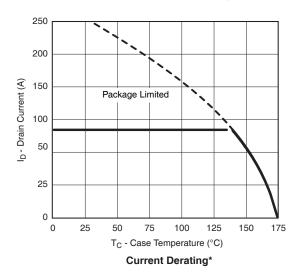


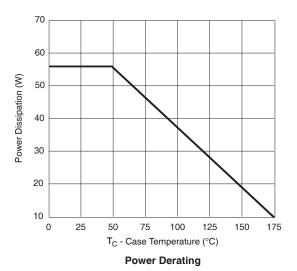
**Threshold Voltage** 



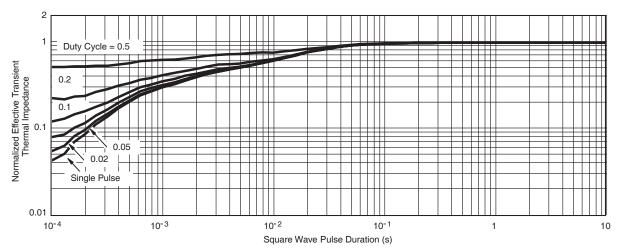
Safe Operating Area, Junction-to-Ambient

#### TYPICAL CHARACTERISTICS (25 °C, unless C+harmina natad)



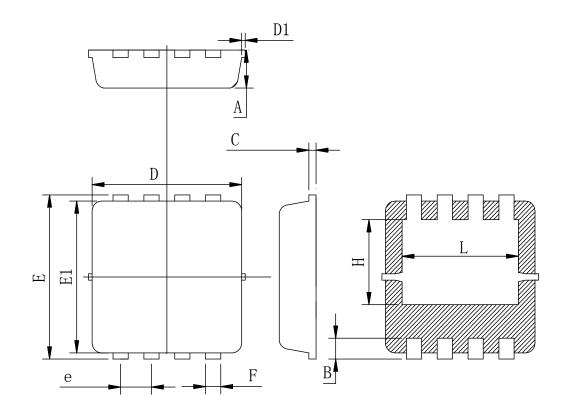


\* The power dissipation  $P_D$  is based on  $T_{J(max)} = 175$  °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



Normalized Thermal Transient Impedance, Junction-to-Case

# **PDFN 3.3X3.3 PACKAGE OUTLINE**



# COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Тур	Max
A	0.600	0.775	1.000
В	0.20	0.38	0.55
С	0.05	0.15	0.40
D	3.10	3.25	3.50
D1	-	-	0.15
Е	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
Н	1.25	1.73	2.10
L	2.20	2.45	2.85





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