

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
150V	65mΩ@10V	14A

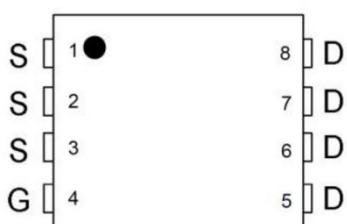
### Feature

- Ultra-low  $R_{DS(ON)}$
- Low Gate Charge
- Fast Switching

### Application

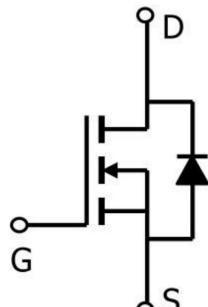
- Motor driving in power tool, E-vehicle, robotics.
- Current switching in DC/DC & AC/DC(SR) sub-systems.
- Power management in telecom, industrial automation, CE .

### Package

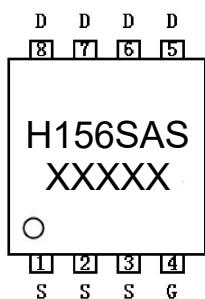


PDFN3.3\*3.3-8L

### Circuit diagram



### Marking



### Absolute maximum ratings ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1)</sup> ( $T_C = 25^\circ\text{C}$ )	$I_D$	14	A
Continuous Drain Current <sup>1)</sup> ( $T_C = 100^\circ\text{C}$ )	$I_D(100^\circ\text{C})$	8.6	
Pulsed Drain Current <sup>2)</sup> ( $T_C = 25^\circ\text{C}$ )	$I_{DM}$	37	A
Power Dissipation <sup>4)</sup> ( $T_C = 25^\circ\text{C}$ )	$P_D$	28	W
Single pulse avalanche energy <sup>3)</sup>	$E_{AS}$	20	mJ
Avalanche current <sup>3)</sup>	$I_{AS}$	20	A
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	4.5	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

### Electrical characteristics ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	150			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 120\text{V}, V_{GS} = 0\text{V}$			1	$\mu\text{A}$
		$V_{DS} = 120\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$			5	
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.5	3.2	4.5	V
Drain-source on-resistance	$R_{DS(\text{on})}$	$V_{GS} = 10\text{V}, I_D = 7\text{A}$		54	65	$\text{m}\Omega$
Forward transconductance	$g_{FS}$	$V_{DS} = 5\text{V}, I_D = 7\text{A}$		10		S
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 75\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		306		pF
Output Capacitance	$C_{oss}$			70		
Reverse Transfer Capacitance	$C_{rss}$			3.8		
Gate resistance	$R_G$	$f = 1\text{MHz}$		1.6		$\Omega$
Total Gate Charge	$Q_g$	$V_{DS} = 75\text{V}, V_{GS} = 10\text{V}, I_D = 7\text{A}$		5.3		nC
Gate-Source Charge	$Q_{gs}$			1.6		
Gate-Drain Charge	$Q_{gd}$			1.9		
Turn-on delay time	$t_{d(on)}$			4.3		
Turn-on rise time	$t_r$	$V_{DS} = 75\text{V}, V_{GS} = 10\text{V}, R_L = 10\Omega, R_{GEN} = 6\Omega$		3.5		nS
Turn-off delay time	$t_{d(off)}$			7.6		
Turn-off fall time	$t_f$			3.5		
<b>Source-Drain Diode characteristics</b>						
Diode Forward current	$I_S$	$T_C = 25^\circ\text{C}$			14	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 1\text{A}$			1.0	V
Reverse recovery time	$t_{rr}$	$I_F = 7\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		75		nS
Reverse recovery charge	$Q_{rr}$			99		nC

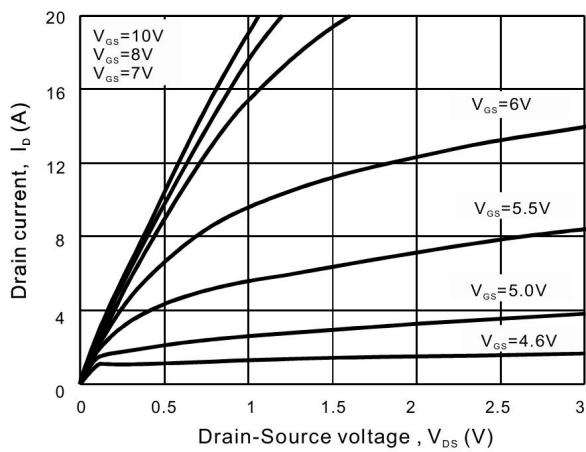
Notes:

- 1) Computed continuous current assumes the condition of  $T_J_{\text{Max}}$  while the actual continuous current depends on the thermal & electro-mechanical application board design.
- 2) This single-pulse measurement was taken under  $T_J_{\text{Max}} = 150^\circ\text{C}$ .
- 3) This single-pulse measurement was taken under the following condition [ $L = 100\text{ uH}, V_{GS} = 10\text{V}, V_{DD} = 75\text{V}$ ] while its value is limited by  $T_J_{\text{Max}} = 150^\circ\text{C}$ .
- 4) The power dissipation  $P_D$  is based on  $T_J_{\text{Max}} = 150^\circ\text{C}$ .
- 5) Guaranteed by design, not subject to production.

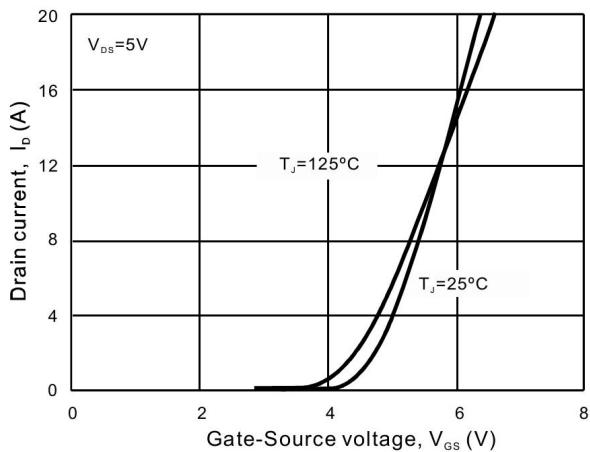


### Typical Characteristics

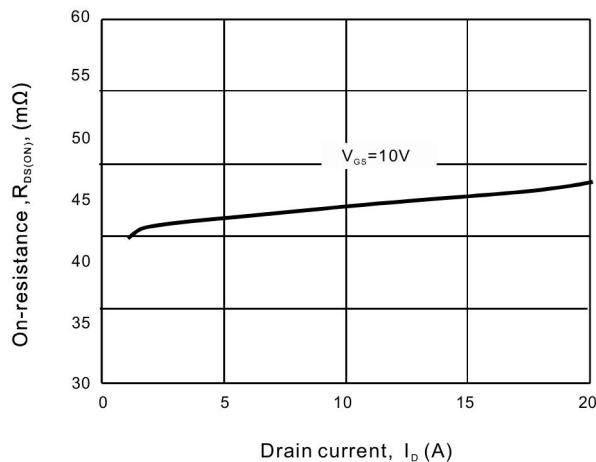
Saturation characteristics



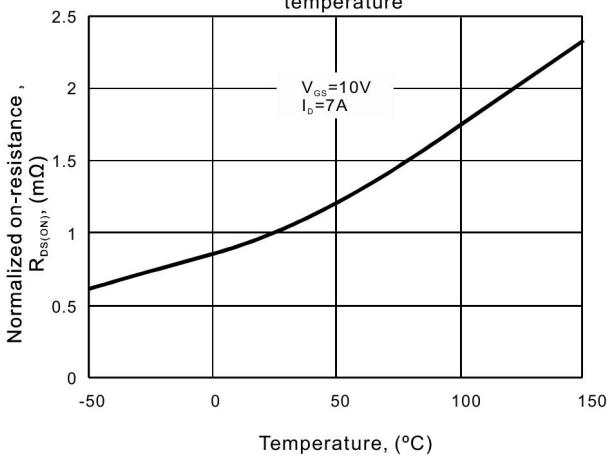
Transfer characteristics



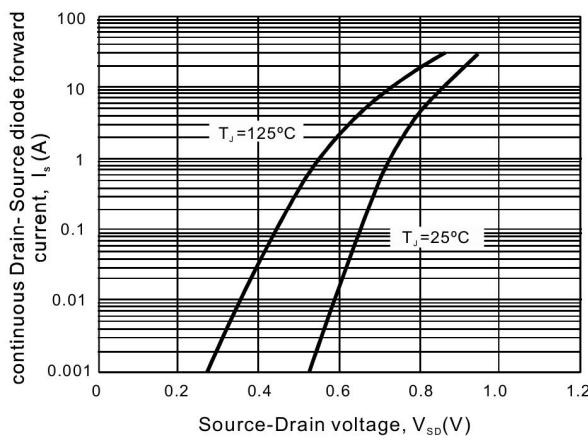
On-resistance vs. Drain current



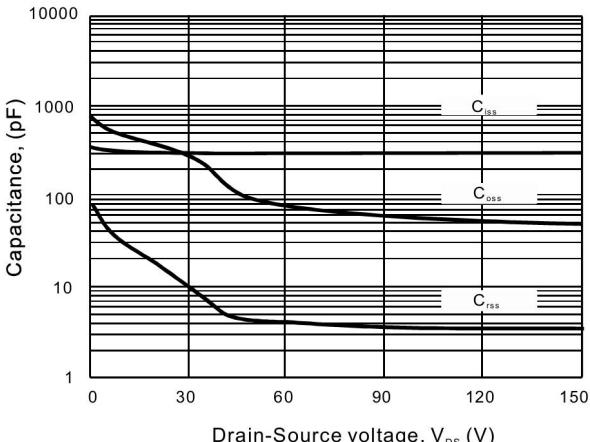
Normalized on-resistance vs. Junction temperature



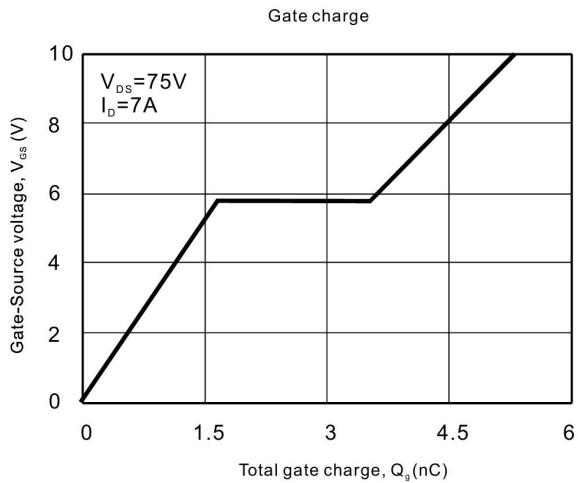
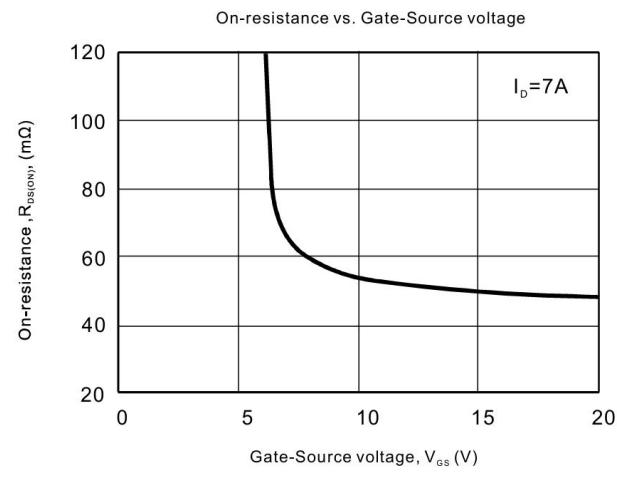
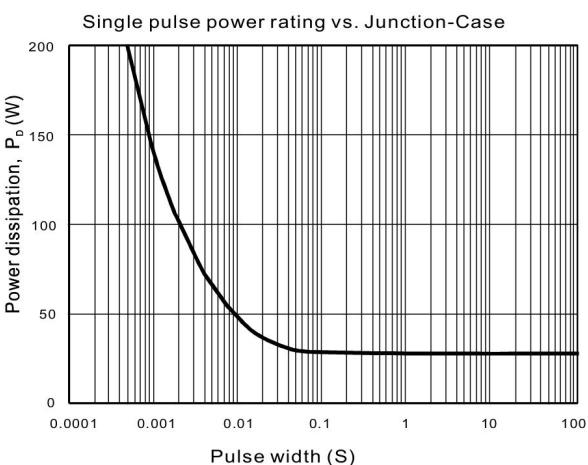
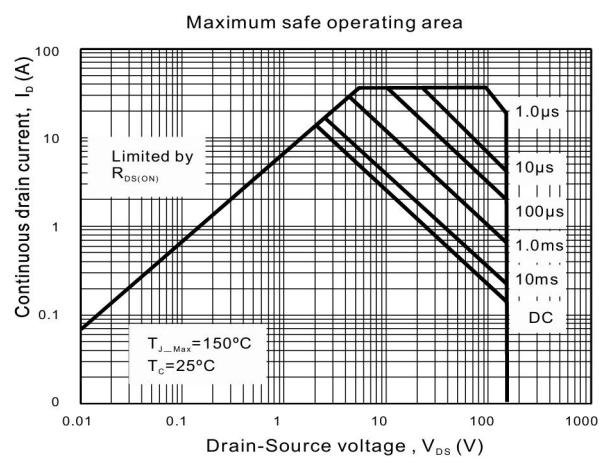
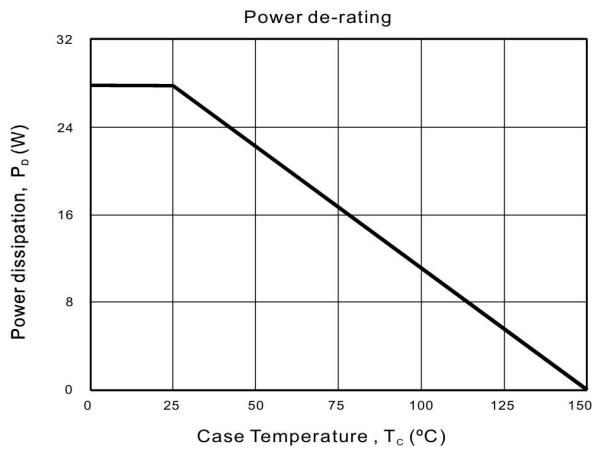
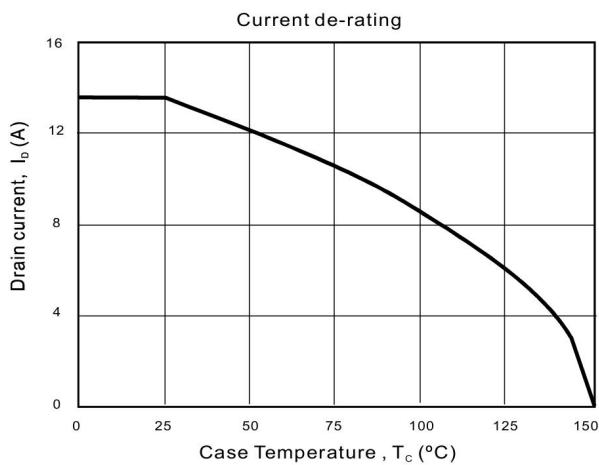
Body-diode characteristics



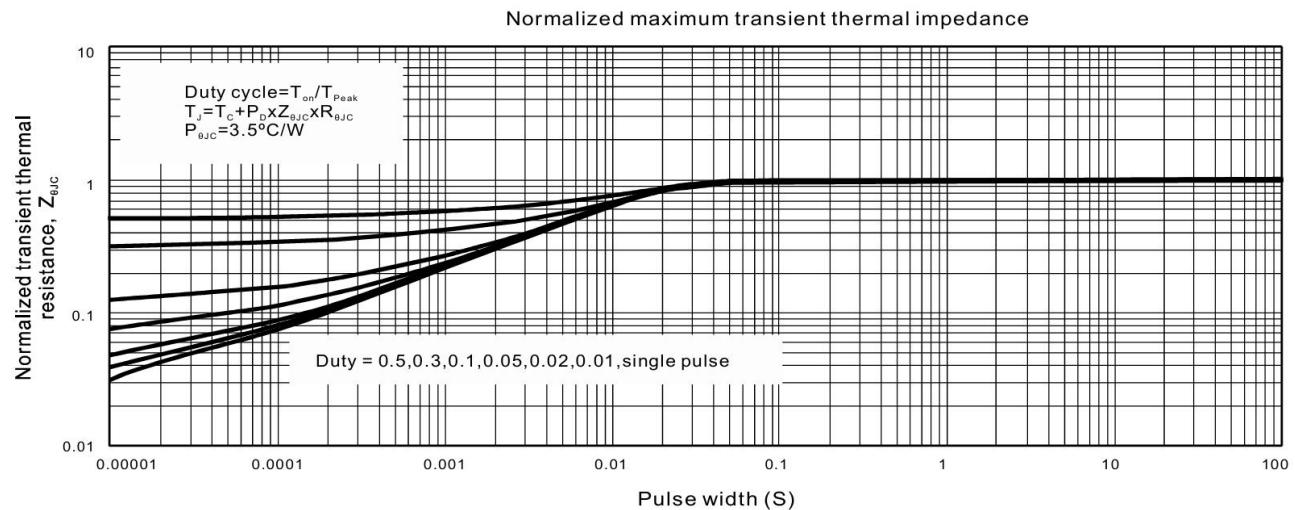
Capacitance characteristics

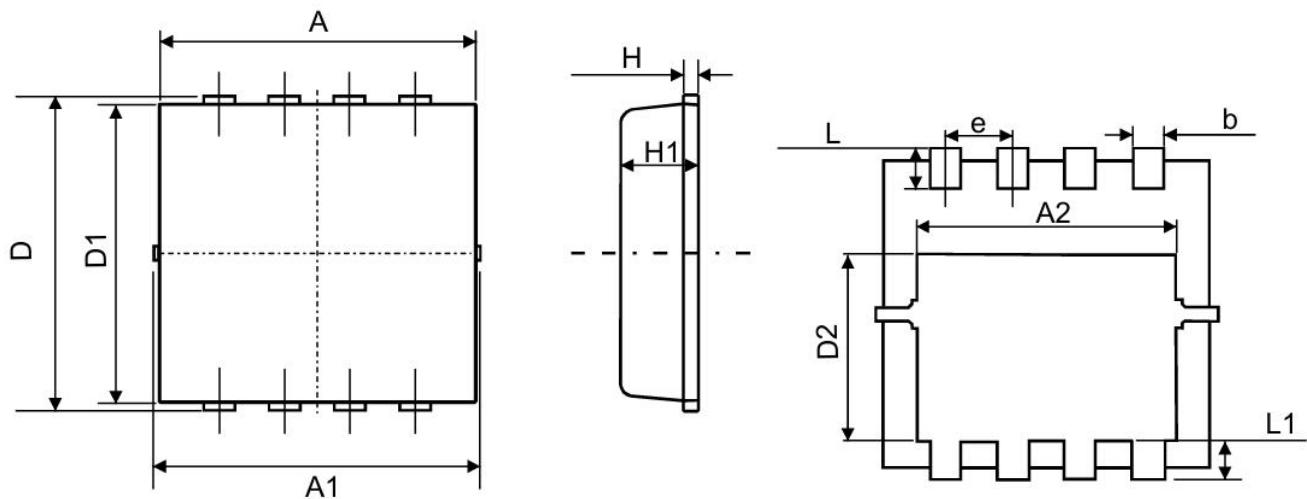


### Typical Characteristics



### Typical Characteristics



**PDFN3.3\*3.3-8L Package Information**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.950	3.150	0.116	0.124
A1	3.000	3.250	0.118	0.128
A2	2.390	2.590	0.094	0.102
b	0.250	0.350	0.010	0.014
D	3.200	3.400	0.126	0.134
D1	2.950	3.150	0.116	0.124
D2	1.700	1.900	0.067	0.075
e	0.650 BSC		0.026 BSC	
H	0.100	0.250	0.004	0.010
H1	0.700	0.800	0.028	0.031
L	0.250	0.500	0.010	0.020
L1	0.300	0.500	0.012	0.020