

## N-Channel 20 V (D-S) MOSFET

### PRODUCT SUMMARY

$BV_{DSS}$	20V
$R_{DS(on)(MAX.)}$	0.0035 $\Omega$
$I_D$	100A

### FEATURES

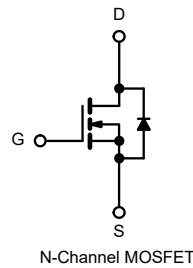
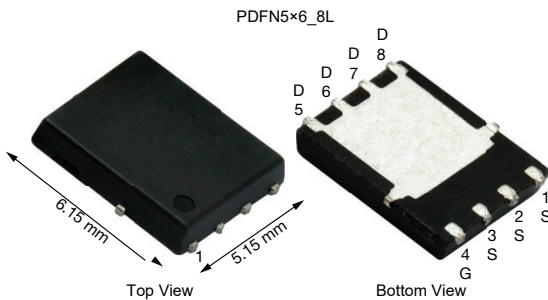
- DT-Trench Power MOSFET
- Excellent  $CdV/dt$  effect decline

### APPLICATIONS

- OR-ing



**RoHS**  
COMPLIANT



### Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current@10V	$I_D$	$T_C = 25\text{ }^\circ\text{C}$	100
		$T_C = 100\text{ }^\circ\text{C}$	59
Pulsed Drain Current	$I_{DM}$	360	A
Single Pulse Avalanche Energy	$E_{AS}$	118	mJ
Avalanche Current	$I_{AS}$	41	A
Total Power Dissipation	$P_D$	113.6	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

### Thermal Characteristics

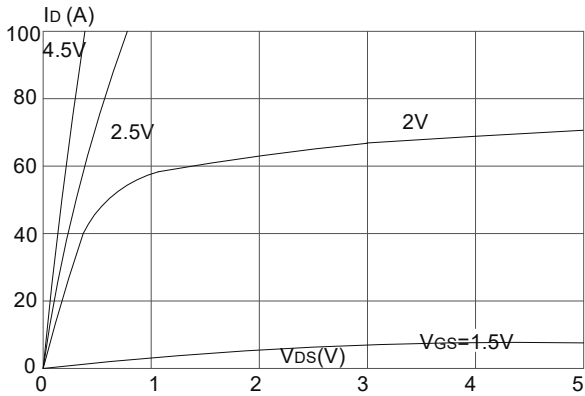
Parameter	Symbol	TYP.	MAX.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	-	1.1	$^\circ\text{C} / \text{W}$

**Electrical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

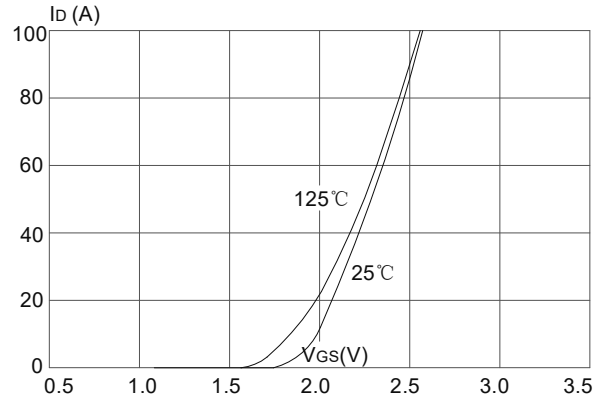
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 250\ \mu\text{A}$	20	-	-	V
Gate-body Leakage current	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 12\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 25^\circ\text{C}$	-	-	1	$\mu\text{A}$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$	0.4		1	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}$ , $I_D = 30\text{ A}$	-	0.0029	0.0035	$\Omega$
		$V_{GS} = 2.5\text{ V}$ , $I_D = 20\text{ A}$	-	0.0043	0.0052	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1\text{ MHz}$	-	3202	-	pF
Output Capacitance	$C_{oss}$		-	462	-	
Reverse Transfer Capacitance	$C_{rss}$		-	447	-	
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 10\text{ V}$ , $V_{GS} = 4.5\text{ V}$ , $I_D = 30\text{ A}$	-	50	-	nC
Gate-Source Charge	$Q_{gs}$		-	3.8	-	
Gate-Drain Charge	$Q_{gd}$		-	21	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}$ , $I_D \cong 30\text{ A}$ , $V_{GEN} = 4.5\text{ V}$ , $R_G = 1.8\ \Omega$	-	10	20	nS
Rise Time	$t_r$		-	15	25	
Turn-Off Delay Time	$t_{d(off)}$		-	35	50	
Fall Time	$t_f$		-	20	30	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$I_S = 50\text{ A}$ , $V_{GS} = 0\text{ V}$	-	-	1.2	V
Continuous Source-Drain Diode Current	$I_S$	$T_J = 25^\circ\text{C}$	-	-	100	A
Continuous Source Current	$I_{SM}$		-	-	360	A
Reverse Recovery Charge	$Q_{rr}$	$T_J = 25^\circ\text{C}$ , $I_F = 30\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$	-	12	-	nC
Reverse Recovery Time	$t_{rr}$		-	25	-	ns

**Notes:**

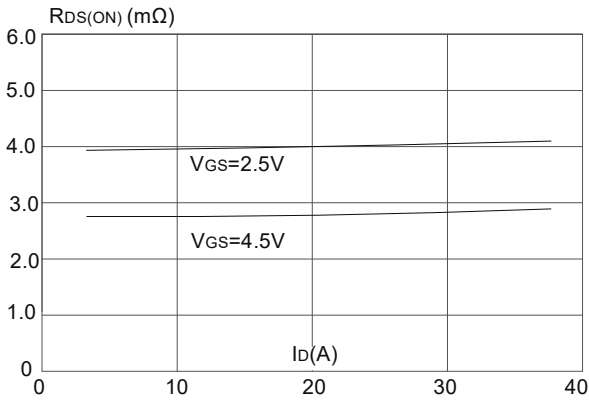
- Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- EAS condition:  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 15\text{ V}$ ,  $V_{GS} = 4.5\text{ V}$ ,  $R_G = 25\ \Omega$ ,  $L = 0.5\text{ mH}$ ,  $I_{AS} = 21\text{ A}$ .
- Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .



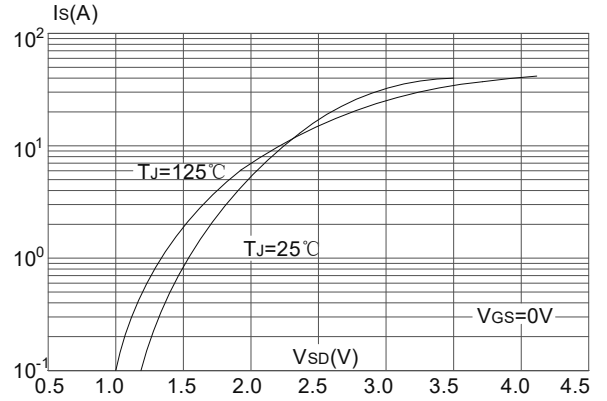
Output Characteristics



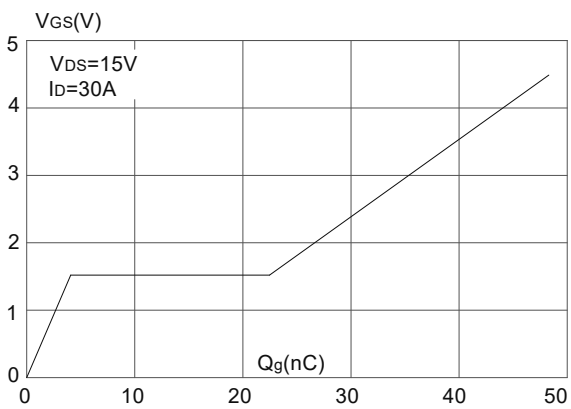
Typical Transfer Characteristics



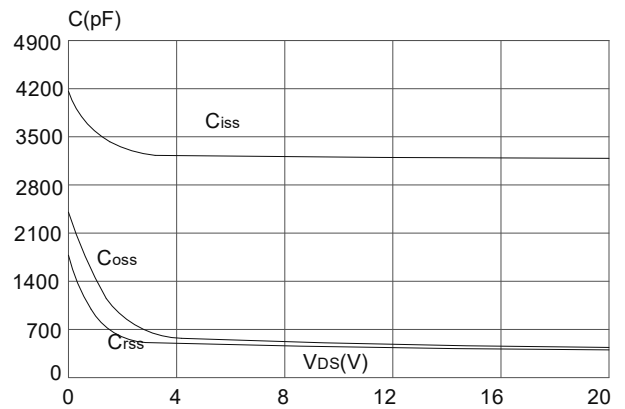
On-resistance vs. Drain Current



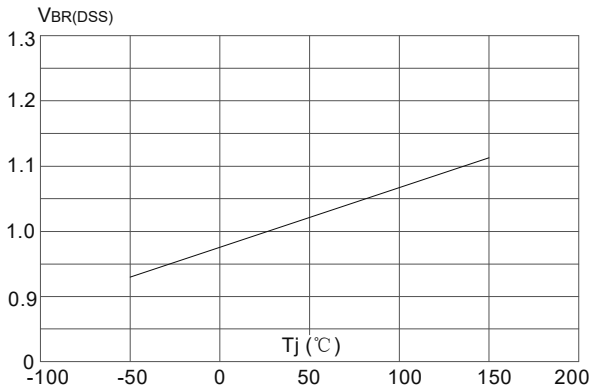
Body Diode Characteristics



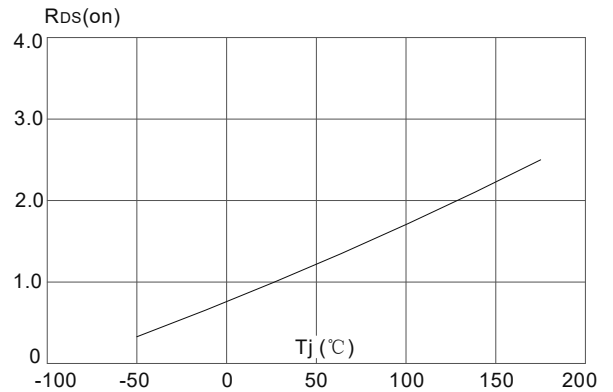
Gate Charge Characteristics



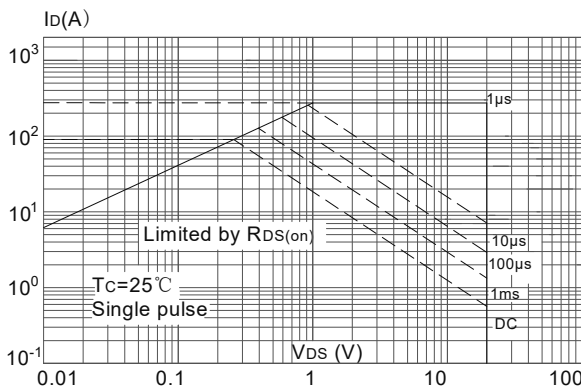
Capacitance Characteristics



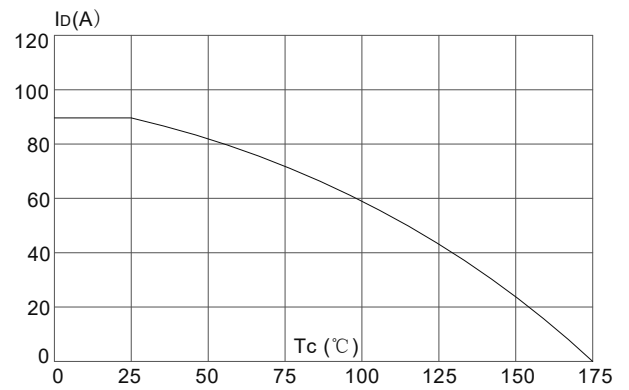
Normalized Breakdown Voltage vs. Junction Temperature



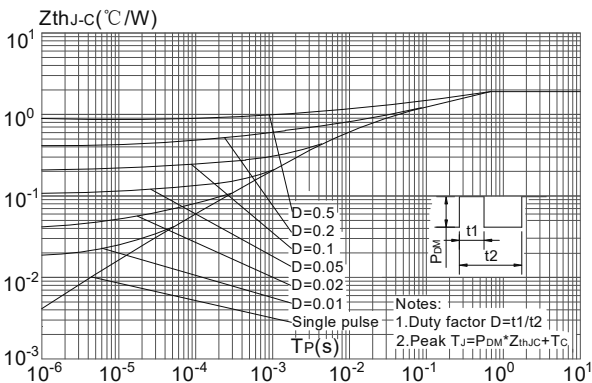
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area

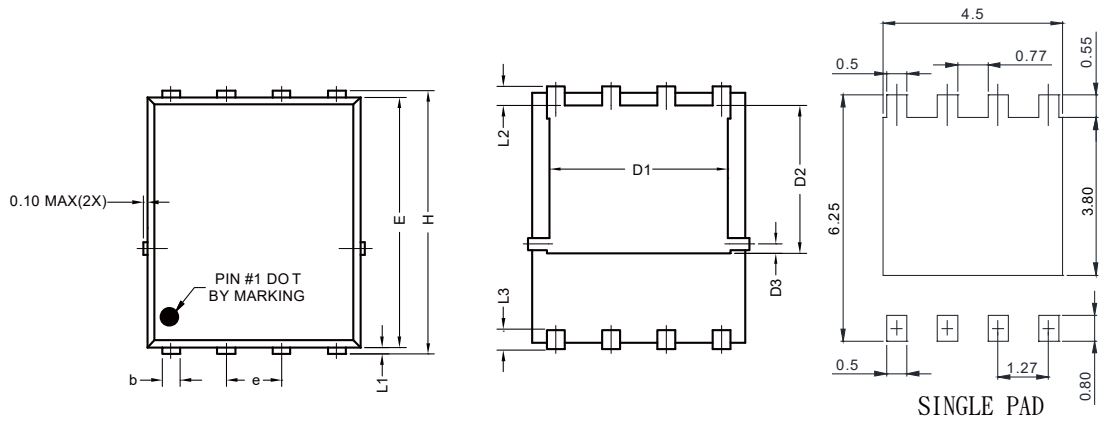


Maximum Continuous Drain Current vs. Case Temperature

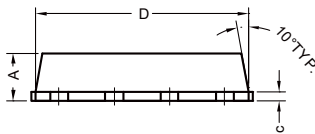


Maximum Effective Transient Thermal Impedance, Junction-to-Case

PDFN5x6-8L\_EP1\_P PACKGE OUTLIN



RECOMMENDED LAND PATTERN



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.800	1.170	0.031	0.046
b	0.340	0.490	0.013	0.019
c	0.20	0.34	0.008	0.013
D	4.800	5.100	0.009	0.011
D1	3.800	4.200	0.150	0.165
D2	3.180	3.78	0.125	0.149
D3	0.150	0.360	0.006	0.142
E	5.650	5.900	0.222	0.232
e	1.270 TYP		0.050 TYP	
H	5.900	6.150	0.232	0.242
L1	0.050	0.250	0.002	0.010
L2	0.380	0.620	0.015	0.024
L3	0.380	0.75	0.015	0.030