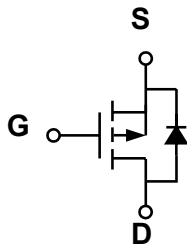


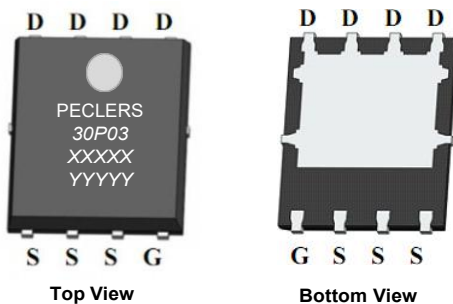
### 30V P-Channel Enhancement Mode MOSFET

#### Schematic diagram



#### Marking and pin assignment

PDFN5\*6-8L-A



XXXXX—Wafer Information YYYYY—  
Quality Code

#### Description

The PECN30P03D6 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for use as a load switch or in PWM applications.

#### General Features

- ◆  $V_{DS} = -30V$ ,  $I_D = -30A$   
 $R_{DS(ON)}(Typ.) = 8m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)}(Typ.) = 12.5m\Omega$  @  $V_{GS} = -4.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package
- ◆ 150 °C operating temperature
- ◆ 100% UIS tested

#### Application

- ◆ PWM applications
- ◆ Load switch
- ◆ Uninterruptible power supply

#### Package

- ◆ PDFN5\*6-8L-A



#### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN30P03D6	-55°C to +150°C	PDFN5*6-8L-A	5000

#### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	-30	V
Gate-source voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	TC=25°C	-30
		TC=70°C	-24
Pulsed Drain Current	$I_{DP}$	-120	A
Avalanche energy ( $T_j=25^\circ C$ , $V_{DD}=30V$ , $V_G=10V$ , $L=0.5mH$ , $R_g=25\Omega$ )	$E_{AS}$	45	mJ
Power Dissipation	$P_D$	TC=25°C	31
		TC=70°C	15
Operating junction Temperature range	$T_j$	-55—150	°C

### Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
		$T_J=85^\circ C$	-	-	-10	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.4	-2.0	V
Drain-source on-state resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-30A$	-	8	13	m $\Omega$
		$V_{GS}=-4.5V, I_D=-20A$	-	12.5	16	
On Status Drain Current	$I_{D(ON)}$	$V_{DS}=-15V, V_{GS}=-10V$	-25	-	-	A
<b>Diode Characteristics</b>						
Diode Forward Voltage <sup>1</sup>	$V_{SD}$	$I_{SD}=-20A, V_{GS}=0V$	-	-0.8	-1.3	V
Diode Continuous Forward Current	$I_S$		-	-30	-	A
Reverse Recovery Time	$t_{rr}$	$I_F=-30A,$ $dI/dt=-100A/\mu s$	-	24	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	16	-	nC
<b>Dynamic Characteristics<sup>2</sup></b>						
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	0.65	-	$\Omega$
Input capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=-15V$ $f=1.0MHz$	-	2000	-	pF
Output capacitance	$C_{OSS}$		-	370	-	
Reverse transfer capacitance	$C_{RSS}$		-	295	-	
Turn-on delay time	$t_{D(ON)}$	$V_{GS}=-10V, V_{DS}=-30V,$ $R_L=3\Omega, I_D=30A, R_G=2.5\Omega$	-	11	-	ns
Turn-on Rise time	$t_r$		-	9.4	-	
Turn-off delay time	$t_{D(OFF)}$		-	24	-	
Turn-off Fall time	$t_f$		-	12	-	
Total gate charge	$Q_g$	$V_{GS}=-10V, I_D=-30A$ $V_{DS}=-15V$	-	30	-	nC
Gate-source charge	$Q_{gs}$		-	4.6	-	
Gate-drain charge	$Q_{gd}$		-	10	-	

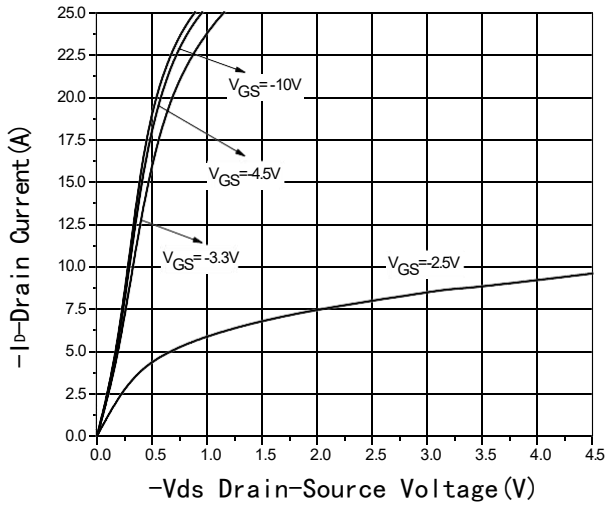
### Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient <sup>A</sup>	$\leq 10s$	29	34	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup>	Steady-State			
Maximum Junction-to-Lead <sup>B</sup>	Steady-State	3.2	4	

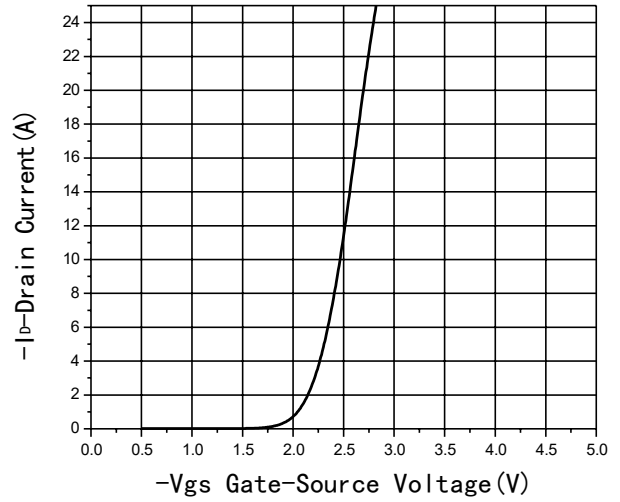
A: The value of  $R_{qJA}$  is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10s$  thermal resistance rating.

B: The  $R_{qJA}$  is the sum of the thermal impedance from junction to lead  $R_{qJL}$  and lead to ambient.

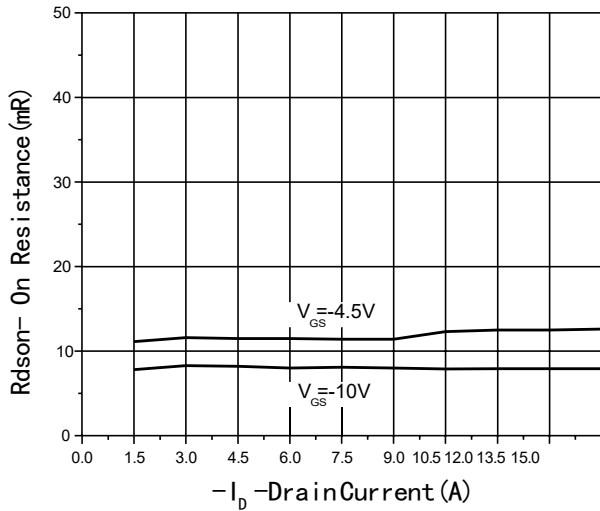
### Typical Performance Characteristics



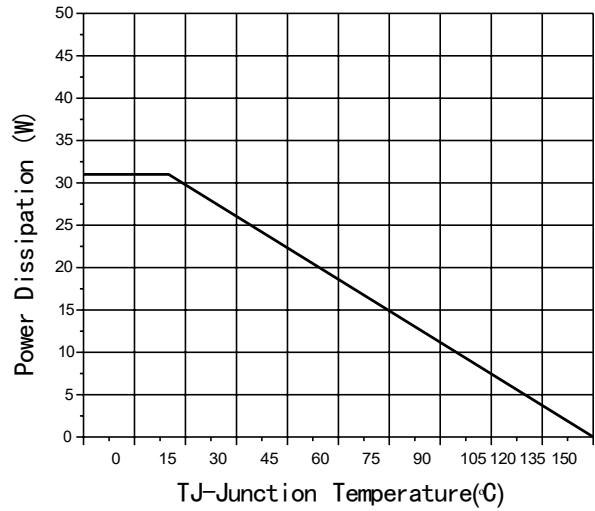
**Fig1 Output Characteristics**



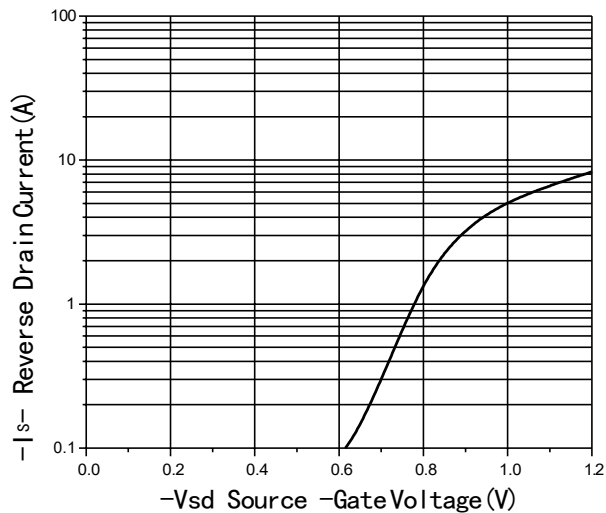
**Fig2 Transfer Characteristics**



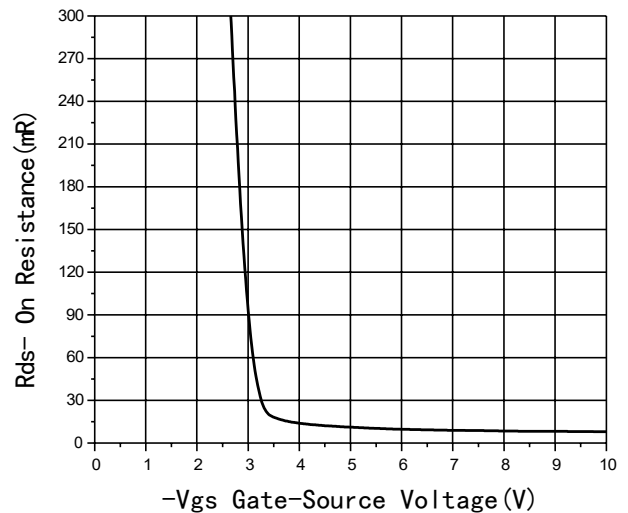
**Fig3 Rds(on)-Drain current**



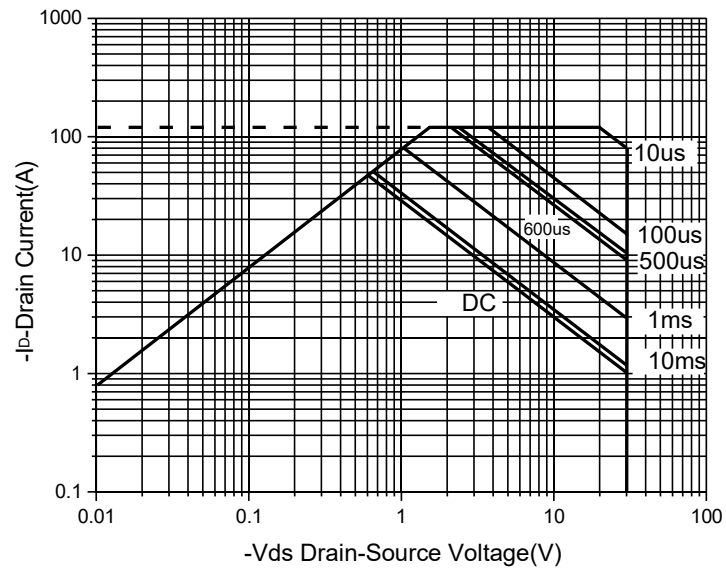
**Fig4 Power De-rating**



**Fig5 Source-Drain Diode Forward**



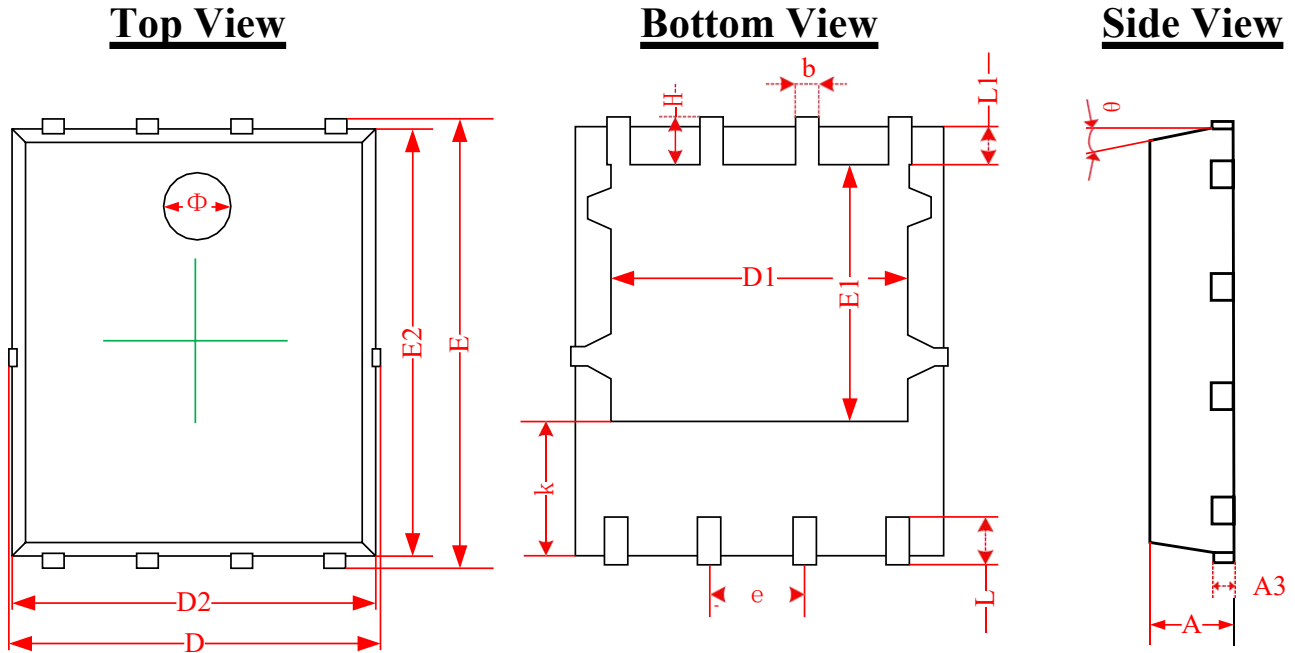
**Fig6 Rds(on)-Gate Drain voltage**



**Fig7 Safe Operation Area**

### Package Information

- PDFN5\*6-8L-A



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.870	0.900	0.930	0.034	0.035	0.036
A3	0.152REF.			0.006REF.		
D	4.944	5.020	5.096	0.195	0.198	0.201
E	5.974	6.050	6.126	0.235	0.238	0.241
D1	3.910	4.010	4.110	0.154	0.158	0.162
E1	3.375	3.475	3.575	0.133	0.137	0.141
D2	4.870	4.900	4.930	0.192	0.193	0.194
E2	5.720	5.750	5.780	0.226	0.227	0.228
k	1.190	1.290	1.390	0.047	0.051	0.055
b	0.350	0.380	0.410	0.014	0.015	0.016
e	1.270TYP.			0.050TYP.		
L	0.559	0.635	0.711	0.022	0.025	0.028
L1	0.424	0.500	0.576	0.017	0.020	0.023
H	0.574	0.650	0.726	0.023	0.026	0.029
$\theta$	10°	11°	12°	10°	11°	12°
$\Phi$	1.150	1.200	1.250	0.045	0.047	0.049