

## Description

### PECJ N-channel Enhancement Mode Power MOSFET

#### Features

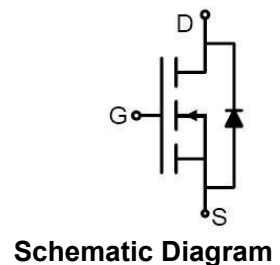
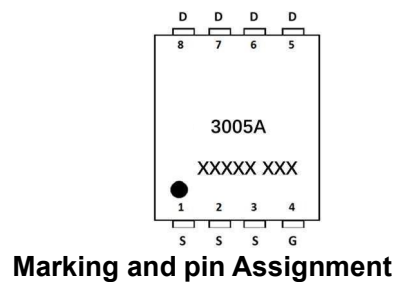
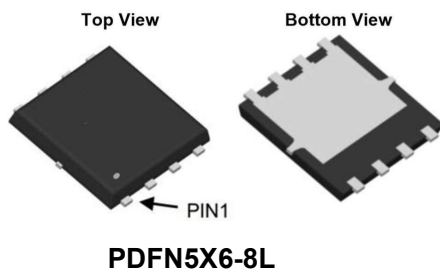
- 30V,60A  
 $R_{DS(ON)} < 5m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 11m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

- Load Switch
- PWM Application
- Power management



*100% UIS TESTED!*  
*100% ΔVds TESTED!*



## Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
PECJ3005AB	PECJ3005AB	TAPING	PDFN5X6-8L	13inch	2500	25000

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	60
		$T_C = 100^\circ\text{C}$	39
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	240	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	85	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	31
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	3.8	5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	-	7.5	11	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz	-	2100	-	pF
C <sub>oss</sub>	Output Capacitance		-	326	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	282	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	-	45	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	3	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	15	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	-	21	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	32	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	59	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	34	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	60	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	240	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/μs	-	15	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	4	-	nC

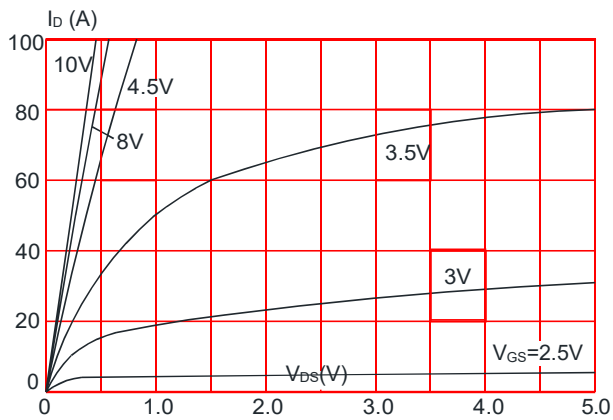
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=15V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=18.4A

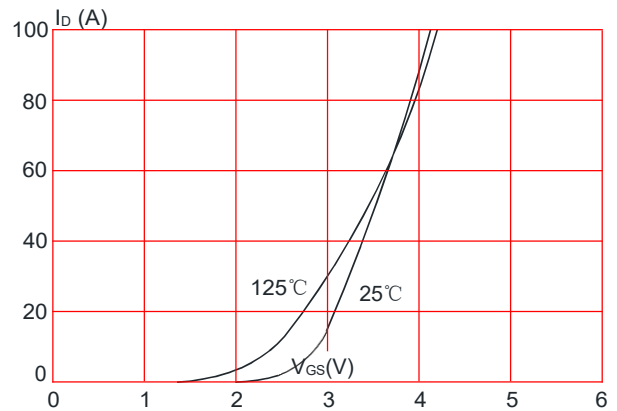
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## Typical Performance Characteristics

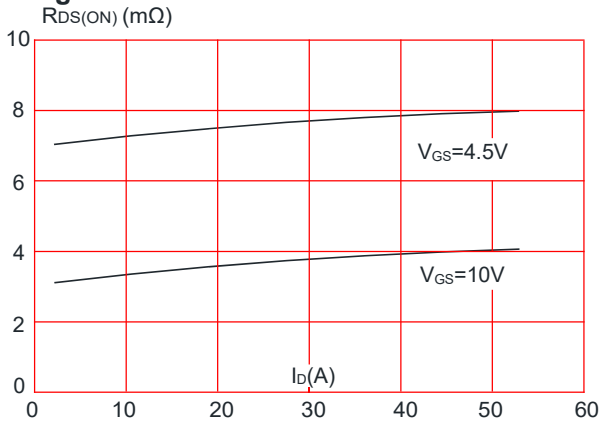
**Figure 1: Output Characteristics**



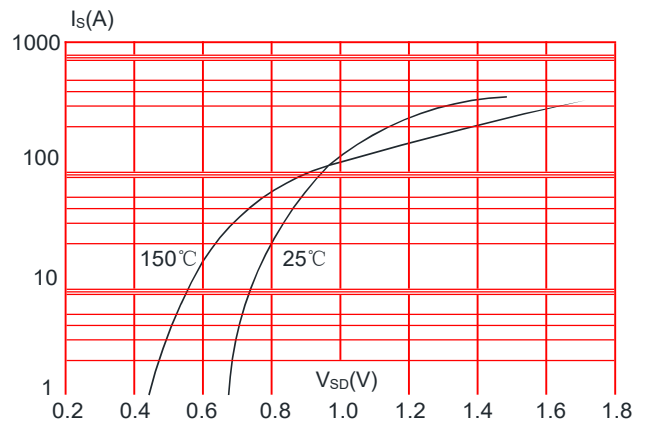
**Figure 2: Typical Transfer Characteristics**



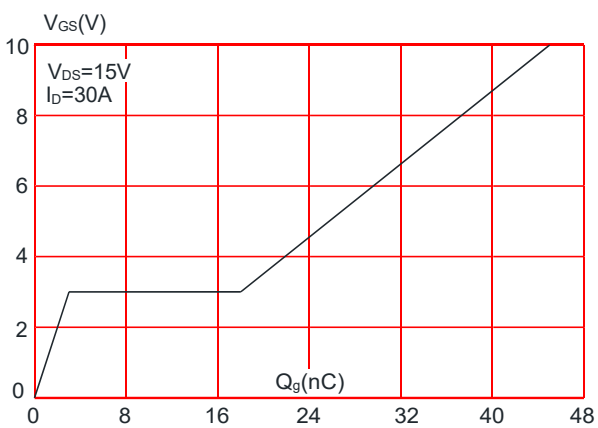
**Figure 3: On-resistance vs. Drain Current**



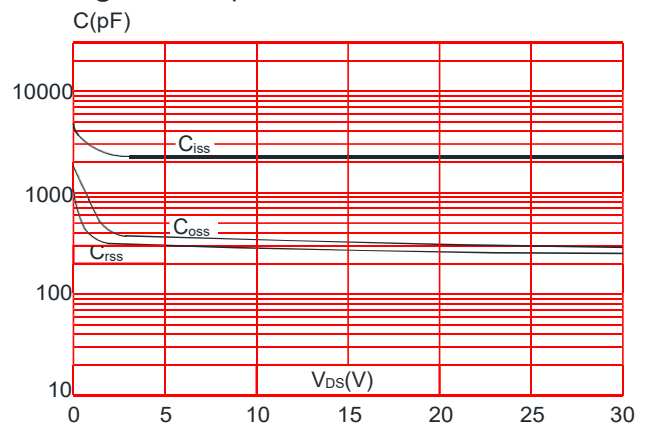
**Figure 4: Body Diode Characteristics**



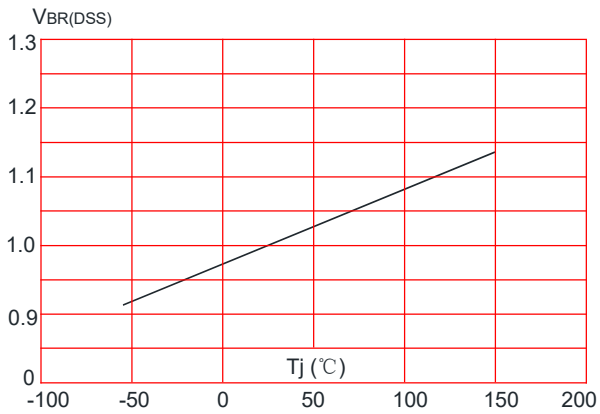
**Figure 5: Gate Charge Characteristics**



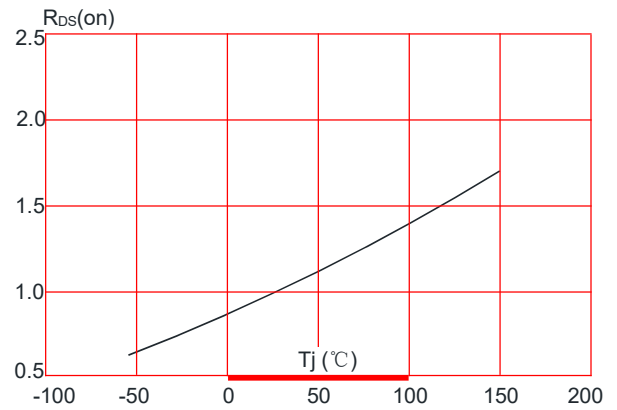
**Figure 6: Capacitance Characteristics**



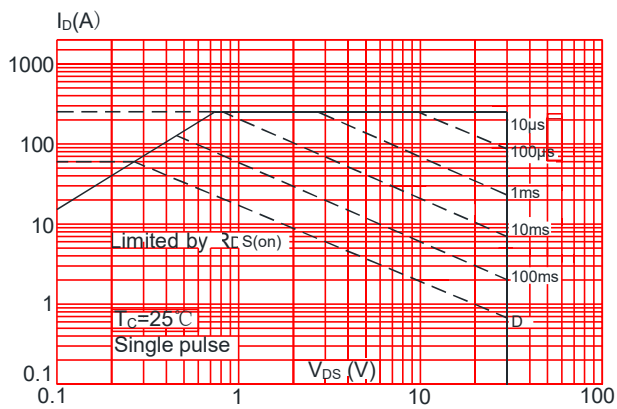
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



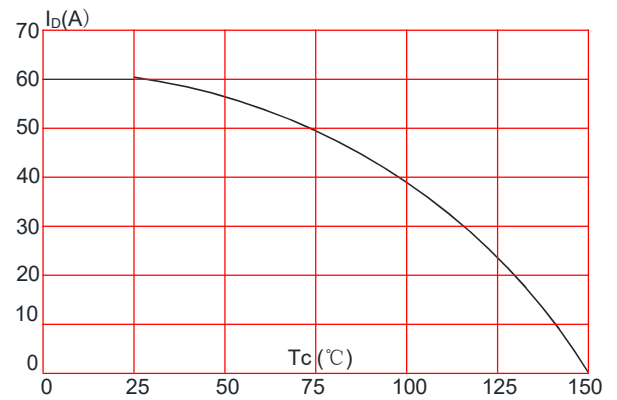
**Figure 8: Normalized on Resistance vs. Junction Temperature**



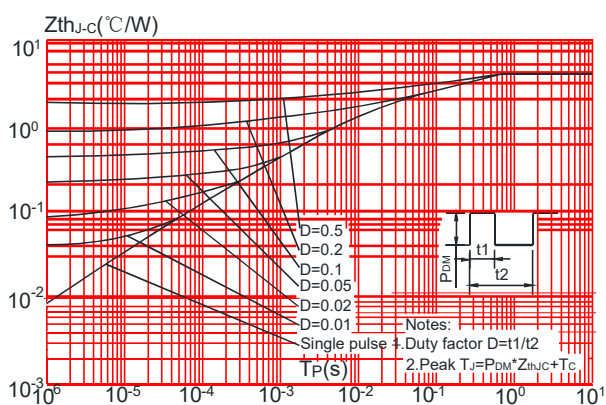
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**



## Test Circuit

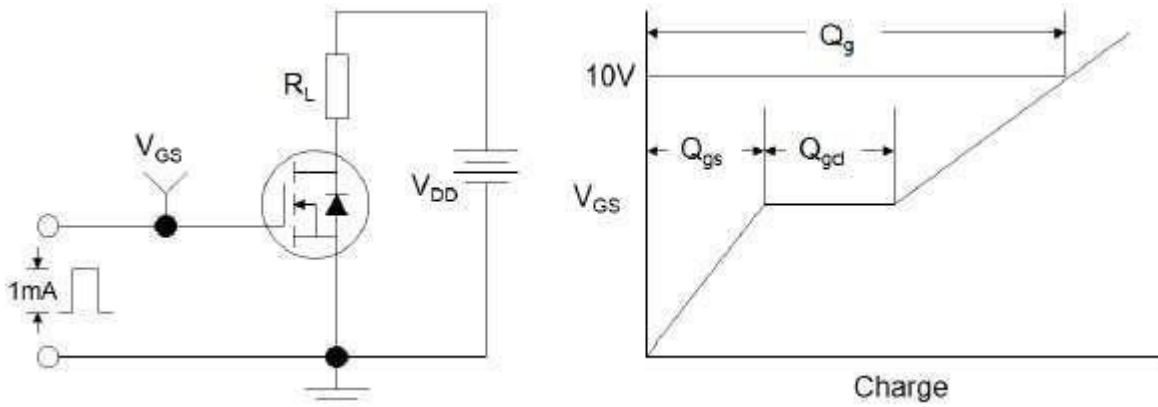


Figure1:Gate Charge Test Circuit & Waveform

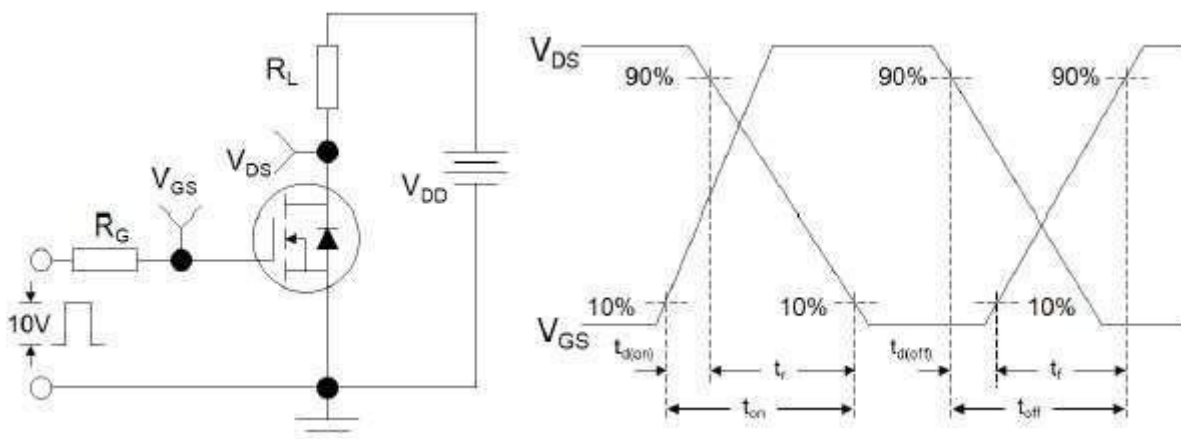


Figure 2: Resistive Switching Test Circuit & Waveforms

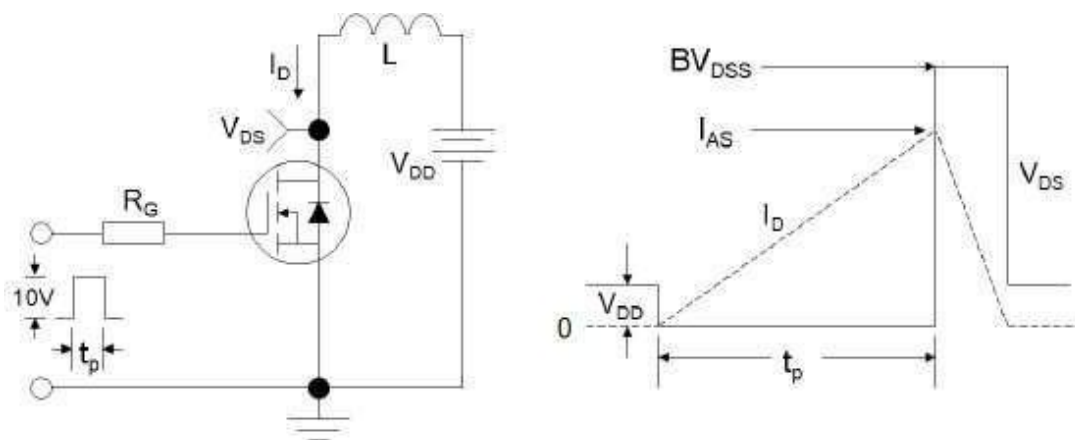
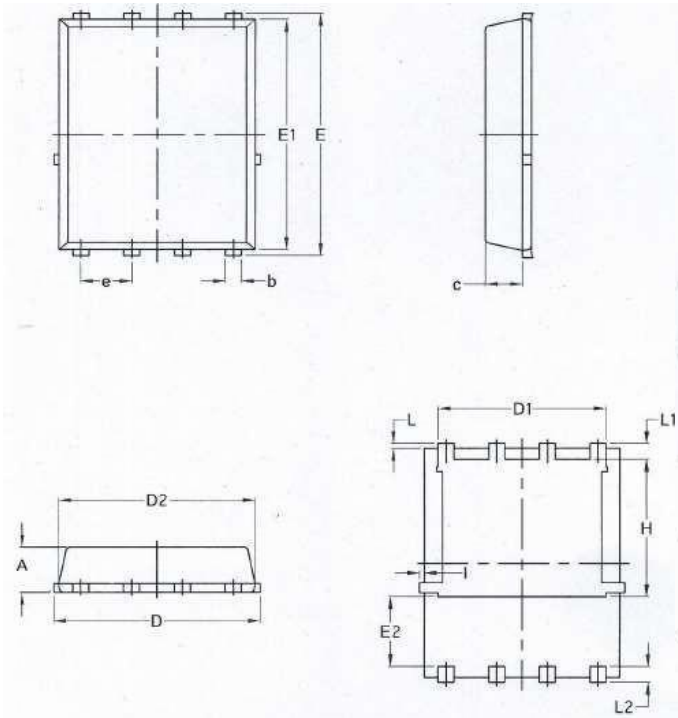


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

## Package Mechanical Data- PDFN5X6-8L



SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
⚠ D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
⚠ D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
e	1.27 BSC		0.05 BSC	
⚠ L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
⚠ H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070