

Description

PECJ N-channel Enhancement Mode Power MOSFET

Features

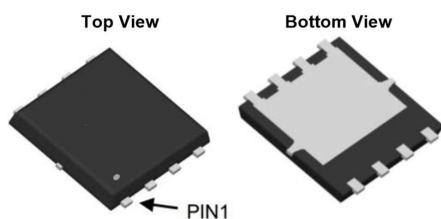
- 30V, 120A
 $R_{DS(ON)} < 2.4m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 5.0m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

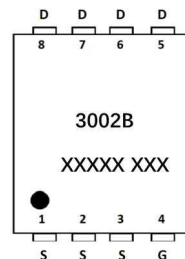
- Load Switch
- PWM Application
- Power management



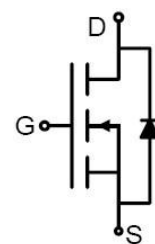
100% UIS TESTED!
100% ΔV_{ds} TESTED!



PDFN5X6-8L



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
G3002B	PECJ3002B	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		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	120	A
		$T_C = 100^\circ\text{C}$	78	A
I_{DM}	Pulsed Drain Current ^{note1}		480	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}		240	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	48	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.6	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ\text{C}$

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	1.8	2.4	mΩ
		V _{GS} =4.5V, I _D =20A	-	3.2	5.0	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	4930	-	pF
C _{oss}	Output Capacitance		-	682	-	pF
C _{rss}	Reverse Transfer Capacitance		-	566	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	70	-	nC
Q _{gs}	Gate-Source Charge		-	10	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	15	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	10	-	ns
t _r	Turn-on Rise Time		-	6.5	-	ns
t _{d(off)}	Turn-off Delay Time		-	75	-	ns
t _f	Turn-off Fall Time		-	18	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	120	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	480	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=100A/μs	-	30	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	15	-	nC

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

2. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=31A

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

Typical Performance Characteristics

Figure 1: Output Characteristics

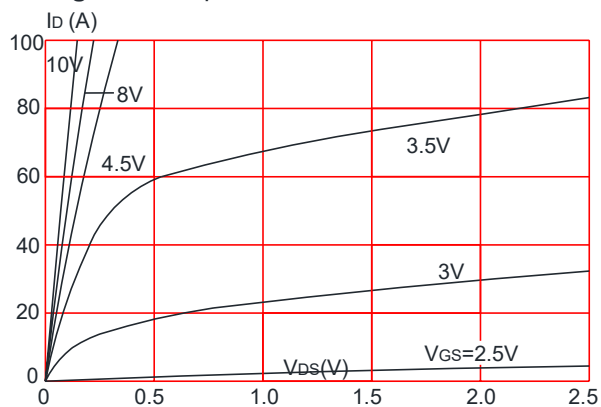


Figure 2: Typical Transfer Characteristics

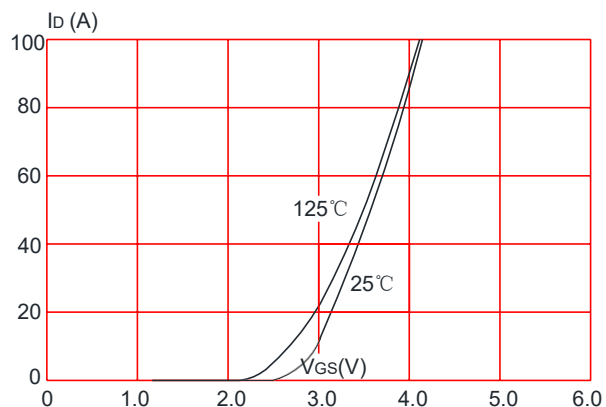


Figure 3: On-resistance vs. Drain Current

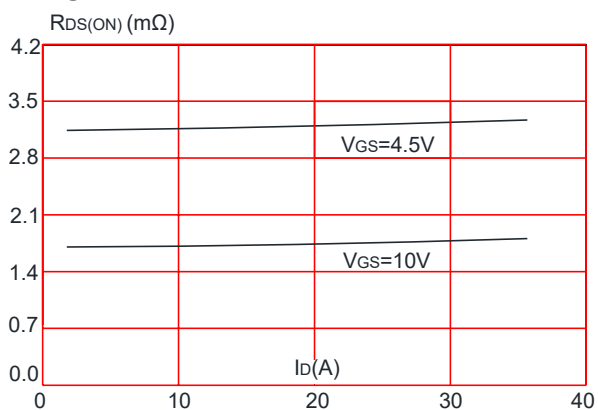


Figure 4: Body Diode Characteristics

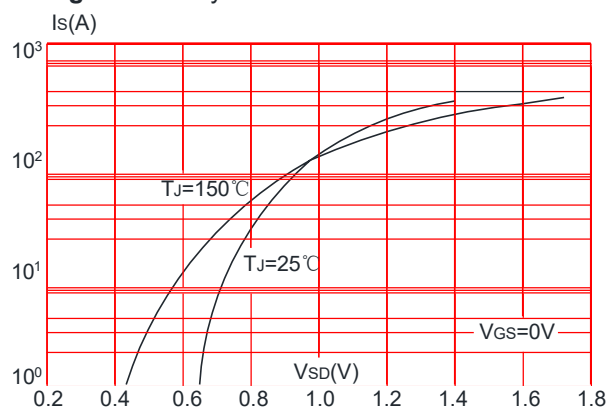


Figure 5: Gate Charge Characteristics

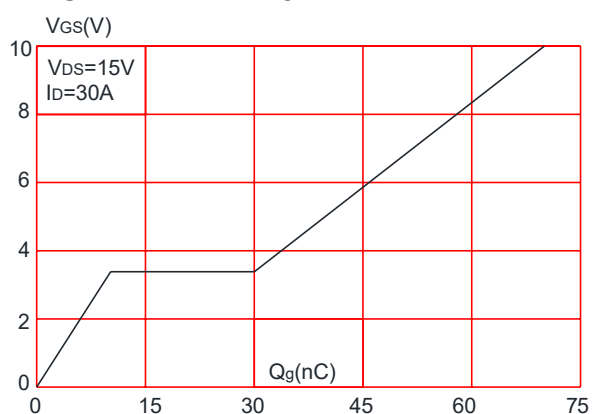


Figure 6: Capacitance Characteristics

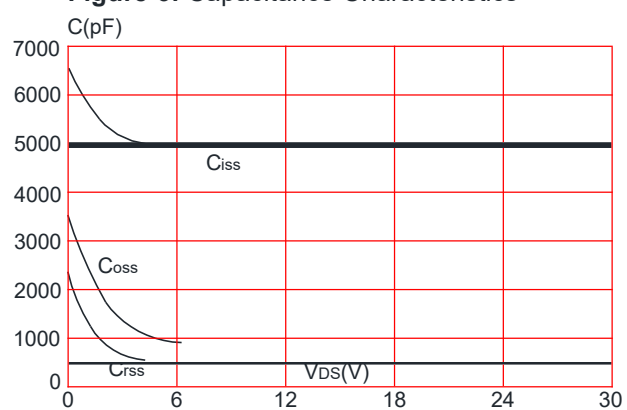


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

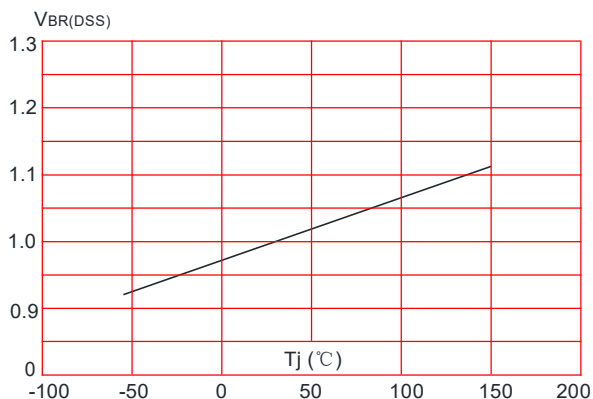


Figure 8: Normalized on Resistance vs. Junction Temperature

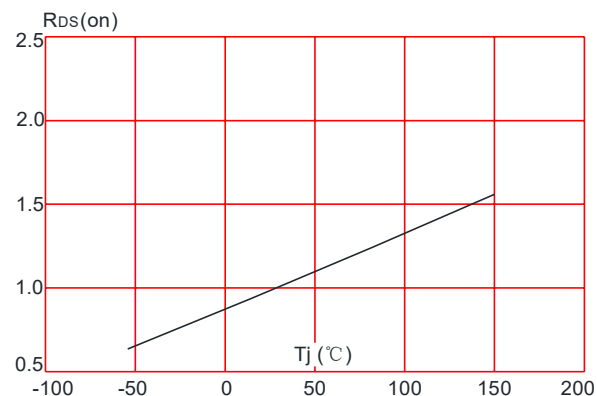


Figure 9: Maximum Safe Operating Area

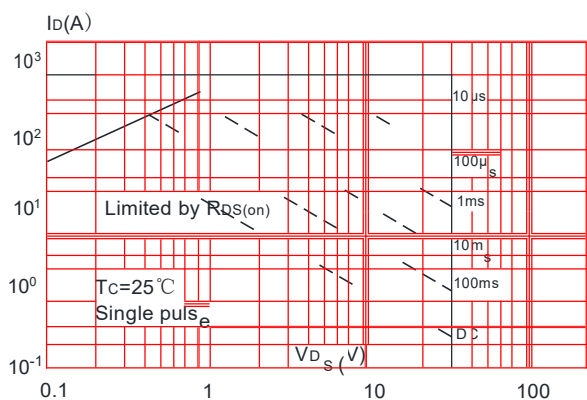


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

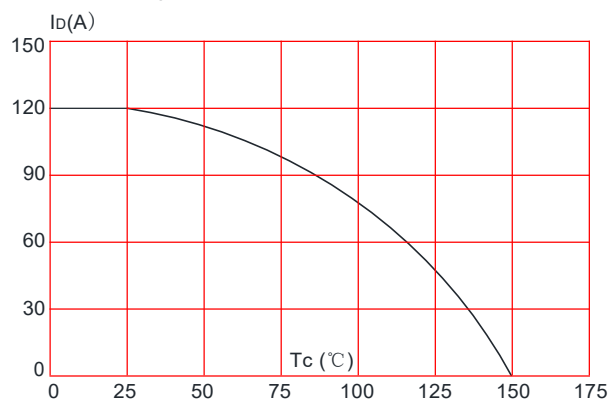
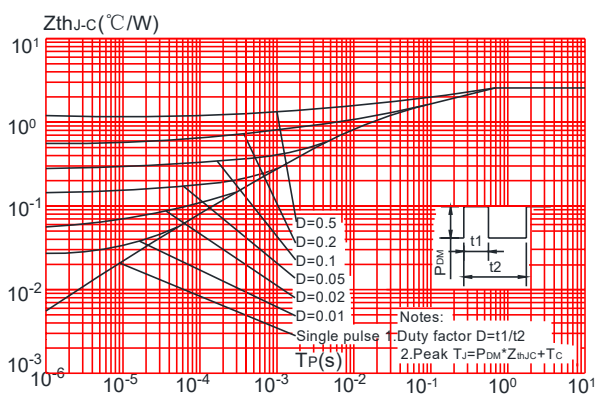


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

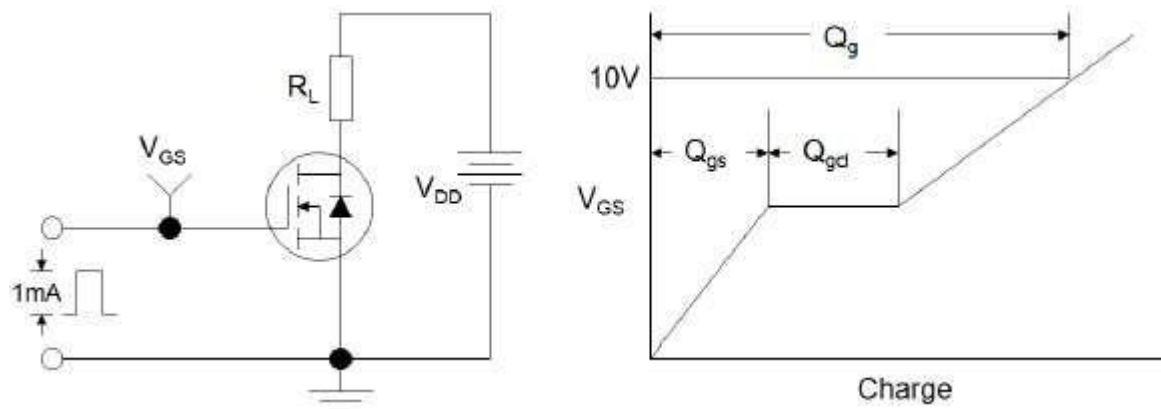


Figure1:Gate Charge Test Circuit & Waveform

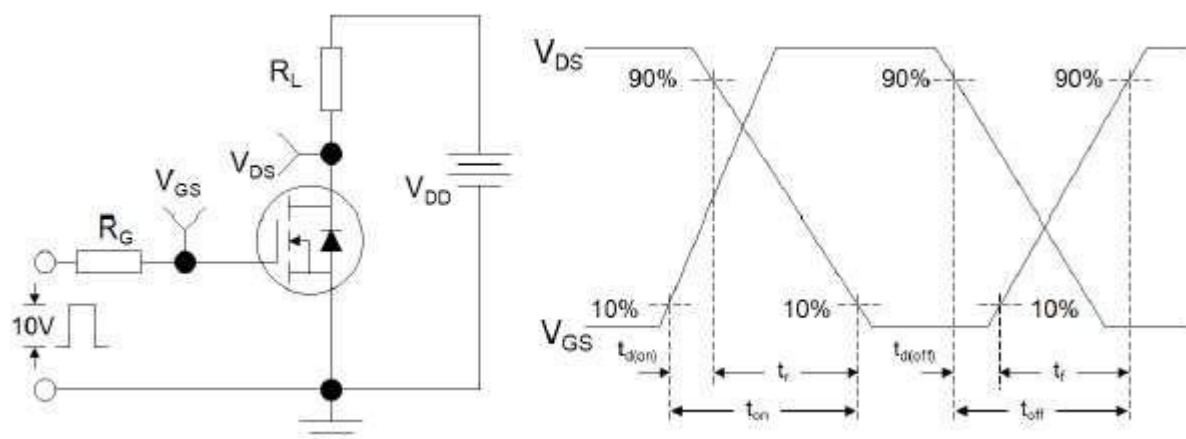


Figure 2: Resistive Switching Test Circuit & Waveforms

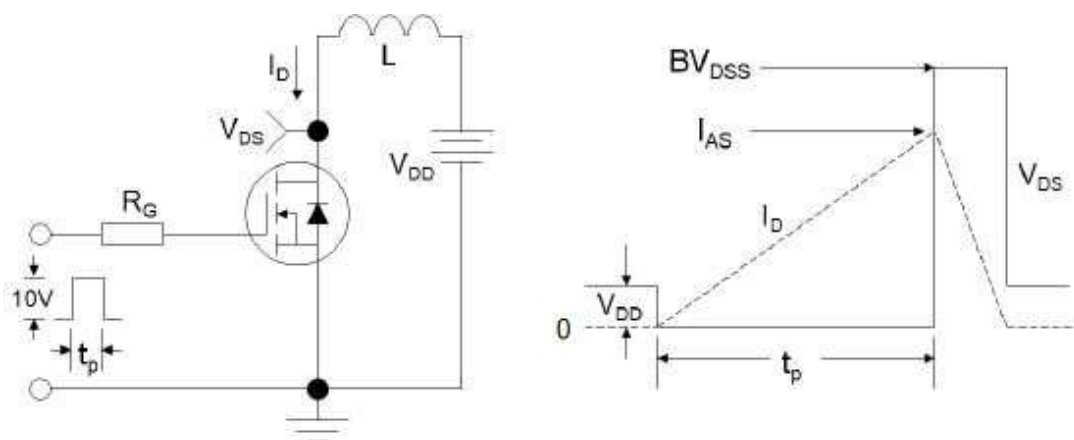
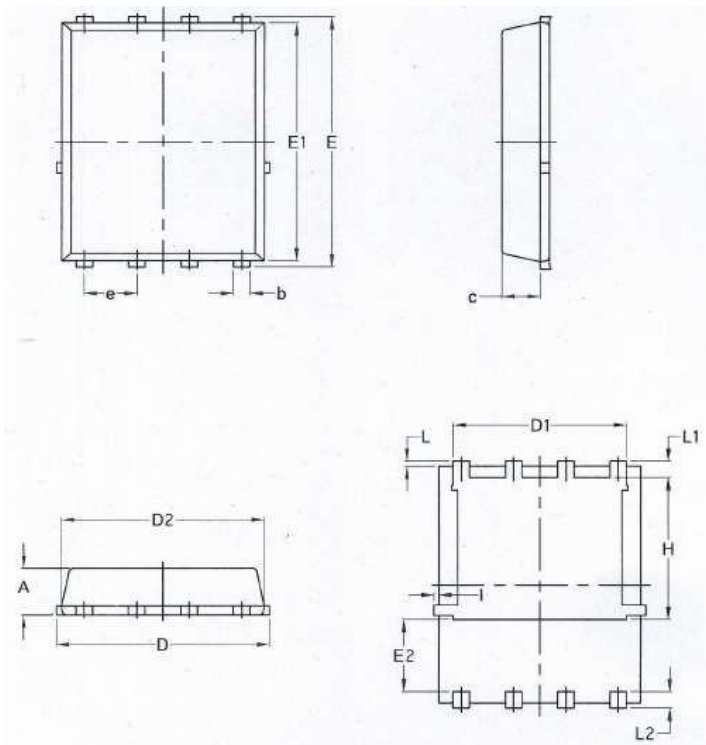


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

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