N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	2.8	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	4.7	mΩ
I_D(Tc=25℃)	80	A

Features

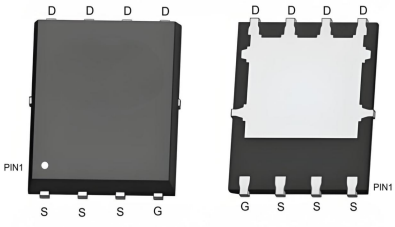
- Advanced Trench Technology
- Low Gate Charge
- Ultra-low $R_{DS(ON)}$

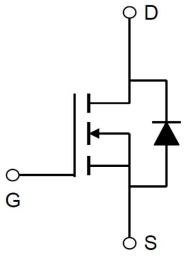
Applications

- Power management functions
- Load switching

Pin Configuration

PDFN5X6-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAP80N03A	PDFN5X6-8L	13″	3000pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current [A]	T_C=25℃	80	A
		T_C=100℃	51	A
I_{DM}	Pulse Drain Current Tested [B]		315	A
E_{AS}	Single Pulse Avalanche Energy [C]		121	mJ
P_D	Power Dissipation @T_C=25℃ [D]		43	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case max	2.9	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.0	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [E]	V_{GS}=10V,I_D=30A	--	2.8	4.0	mΩ
		V_{GS}=4.5V,I_D=20A	--	4.7	6.5	mΩ
V_{SD}	Diode Forward Voltage	I_S=30A,V_{GS}=0V	--	--	1.2	V
I_S	Diode Continuous Current	T_C=25℃	--	--	80	A
Dynamic Parameters [F]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1MHZ	--	2680	--	pF
C_{oss}	Output Capacitance		--	393	--	pF
C_{rss}	Reverse Transfer Capacitance		--	330	--	pF
Q_g	Total Gate Charge	V_{DS}=15V,I_D=30A V_{GS}=10V	--	30	--	nC
Q_{gs}	Gate-Source Charge		--	7.2	--	nC
Q_{gd}	Gate-Drain Charge		--	10.4	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=15V ,R_{GEN}=3Ω, I_D=30A, V_{GS}=10V	--	23	--	ns
t_r	Turn-on Rise Time		--	28	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	74	--	ns
t_f	Turn-off Fall Time		--	36	--	ns
t_{rr}	Reverse recovery time	I_F=20A, di/dt=100 A/uS	--	28	--	ns
Q_{rr}	Reverse recovery charge		--	21	--	nC

A. Computed continuous current assumes the condition of TJ_Max while the actual continuous current depends on the thermal & electro-mechanical application board design.

B. This single-pulse measurement was taken under TJ_Max=150℃.

C. EAS condition: T_J=25℃, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=22A.

D. The power dissipation P_D is based on TJ_Max=150°C.

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

F. Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure1: Output Characteristics

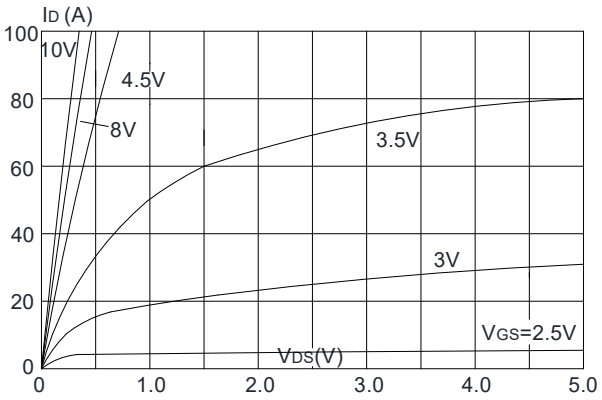


Figure 2: Typical Transfer Characteristics

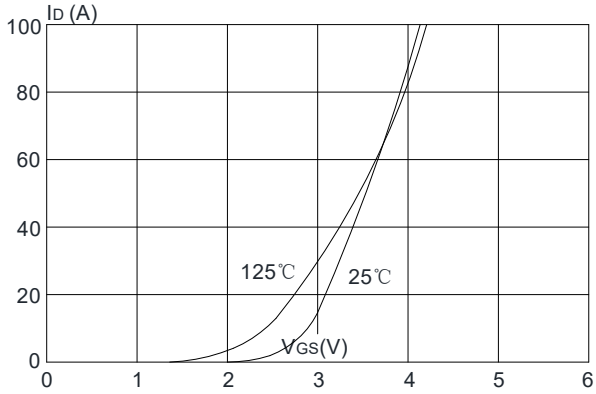


Figure 3: On-resistance vs. Drain Current

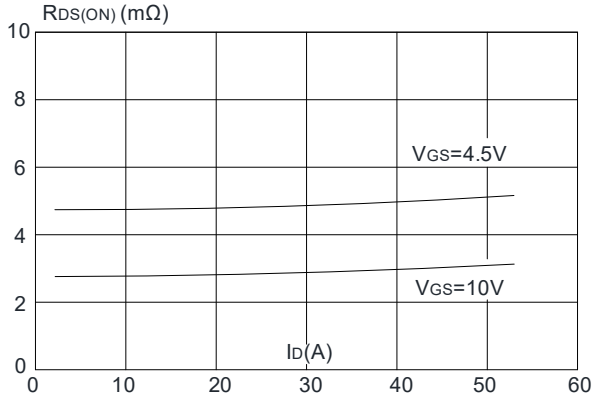


Figure 4: Body Diode Characteristics

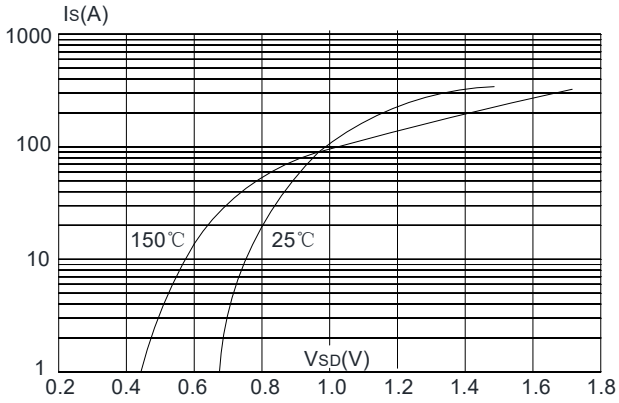


Figure 5: Gate Charge Characteristics

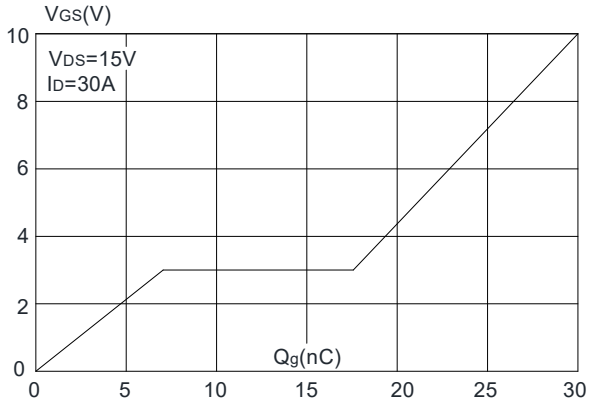
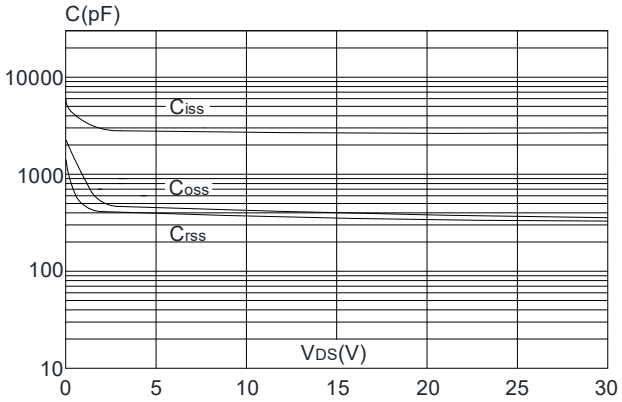


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

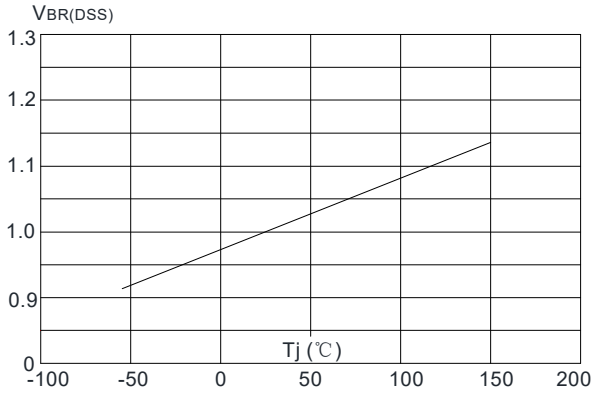


Figure 8: Normalized on Resistance vs. Junction Temperature

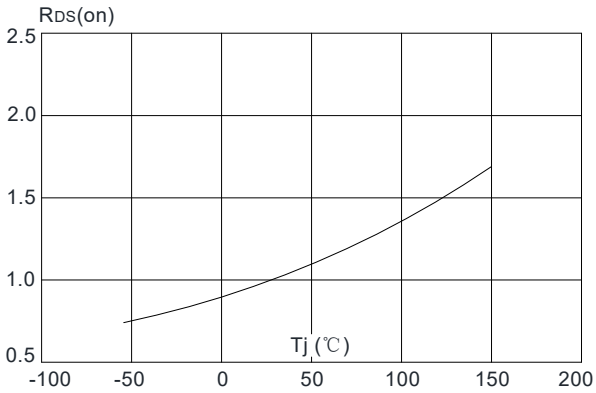


Figure 9: Maximum Safe Operating Area

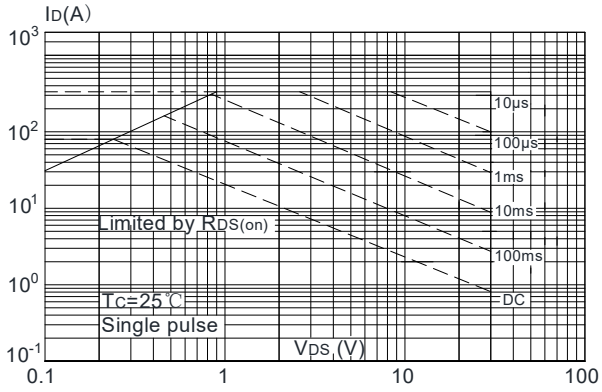


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

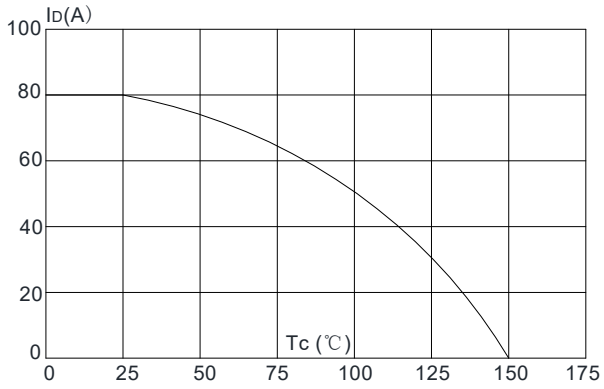
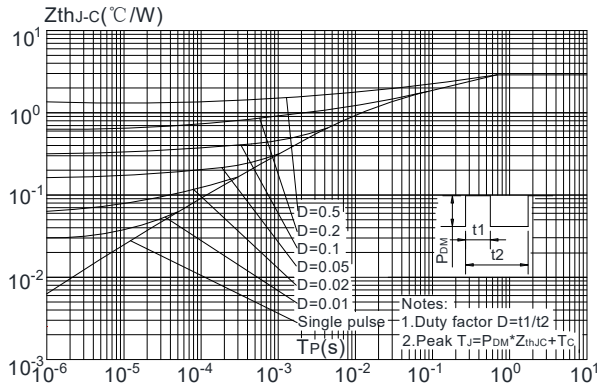


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

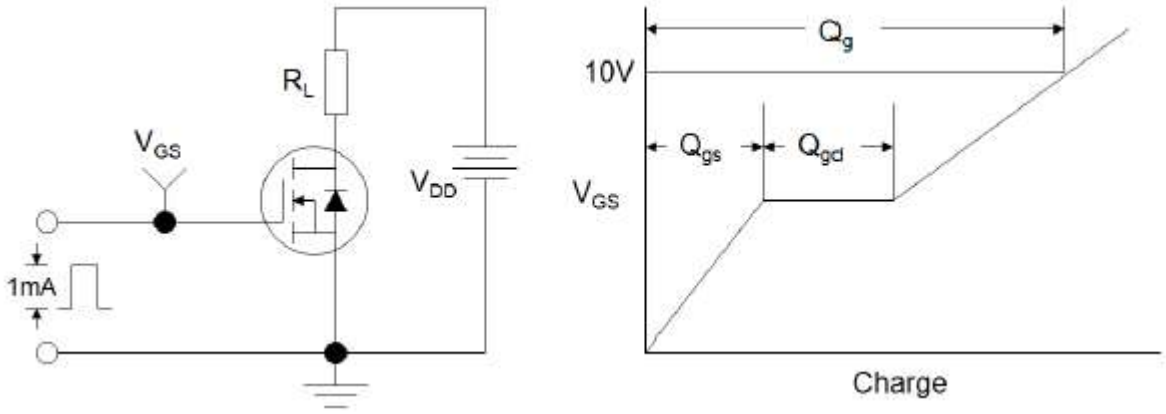


Figure1:Gate Charge Test Circuit & Waveform

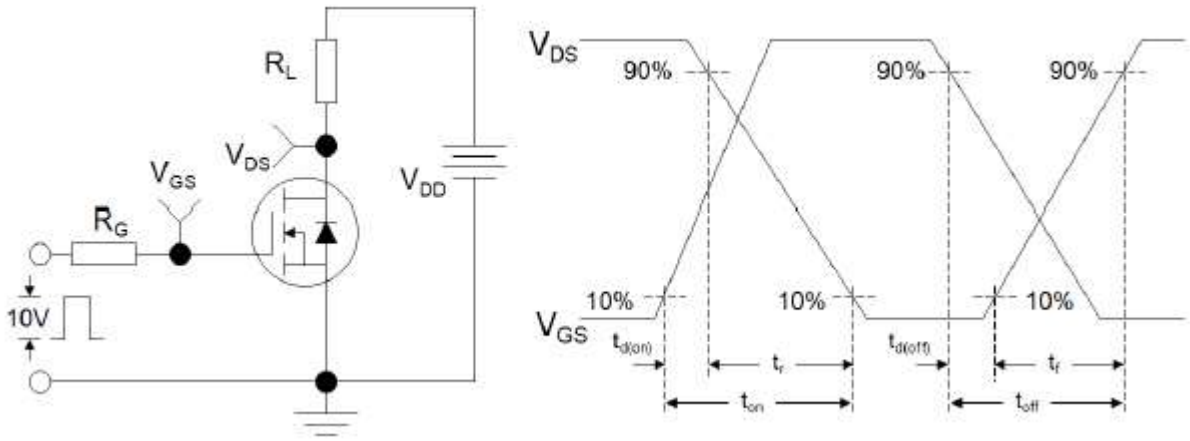


Figure 2: Resistive Switching Test Circuit & Waveforms

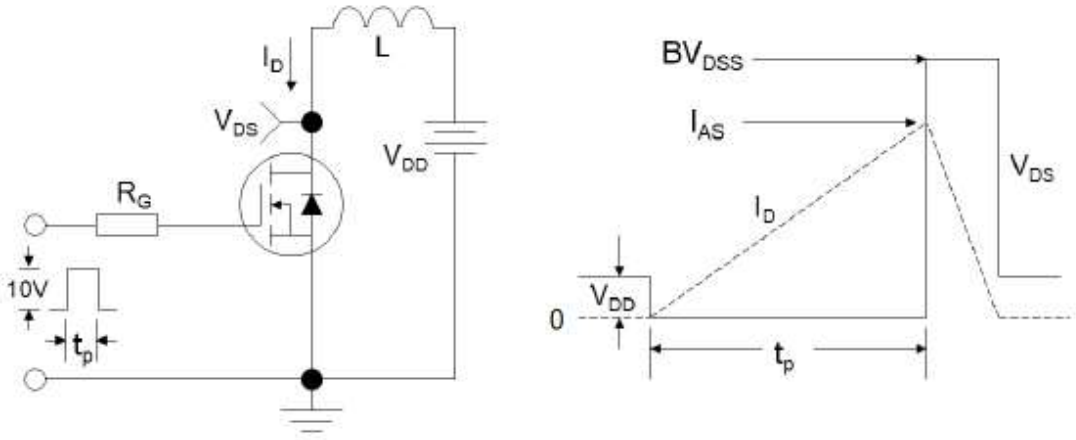
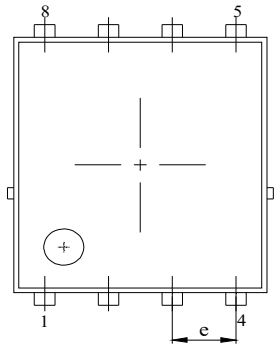
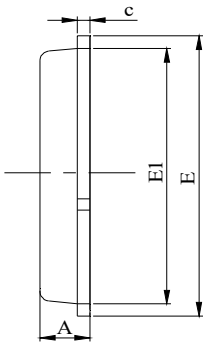


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

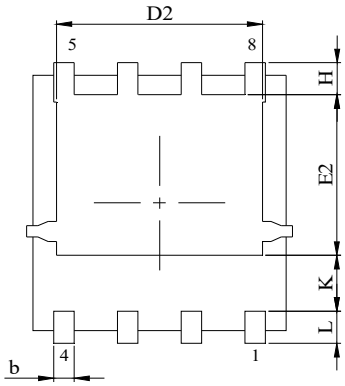
PDFN5X6-8L Package Information (unit:mm)



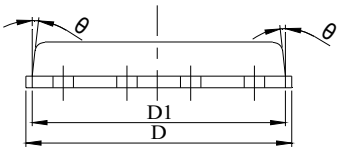
Top View



Side View



Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e		1.27BSC	
H	0.60	0.70	0.80
L	0.50	0.70	0.80
θ	-	-	10°