N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	3.4	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	5.4	mΩ
I_D(Tc=25℃)	60	A

Features

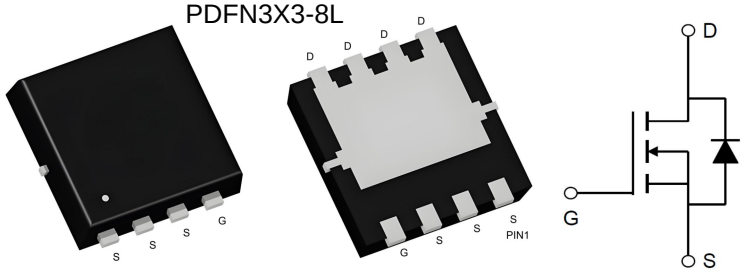
- Advanced Trench Technology
- Low Gate Charge

Applications

- Load switching
- PWM Applications

Pin Configuration

PDFN3X3-8L



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAL60N03A	PDFN3X3-8L	13″	5000pcs

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	T_C=25℃	60	A
		T_C=100℃	39	A
I_{DM}	Pulse Drain Current [A]		240	A
E_{AS}	Single Pulse Avalanche Energy [B]		81	mJ
P_D	Power Dissipation @T_C=25℃		41	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	3.0	℃/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 [C]	V_{GS}=10V,I_D=30A	--	3.4	4.4	mΩ
		V_{GS}=4.5V,I_D=20A	--	5.4	7.5	mΩ
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V	--	--	1.2	V
I_S	Diode Forward Current	T_C=25℃	--	--	60	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1MHZ	--	2750	--	pF
C_{oss}	Output Capacitance		--	413	--	pF
C_{rss}	Reverse Transfer Capacitance		--	360	--	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

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. EAS condition: T_J=25℃, R_G=25Ω,V_{DD}=15V, V_G=10V, L=0.5mH,I_{AS}=18A.

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

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

Typical Characteristics

Figure1: Output Characteristics

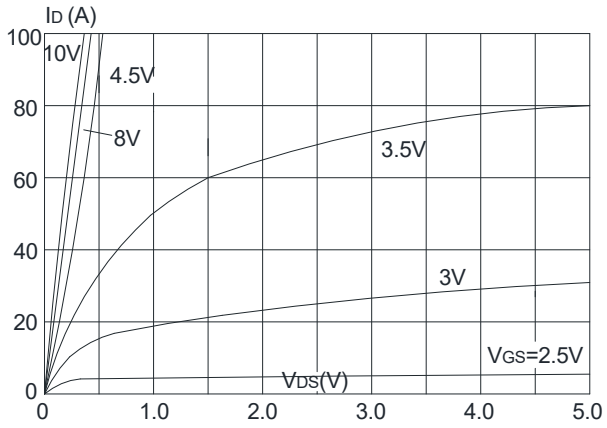


Figure 2: Typical Transfer Characteristics

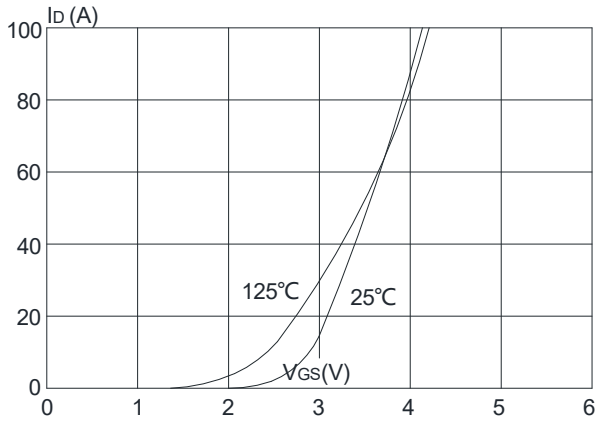


Figure 3: On-resistance vs. Drain Current

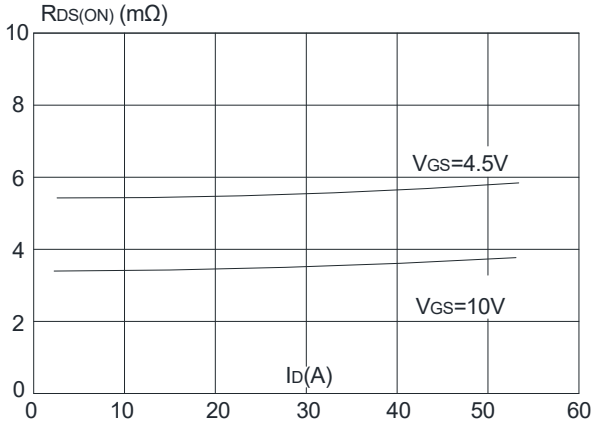


Figure 4: Body Diode Characteristics

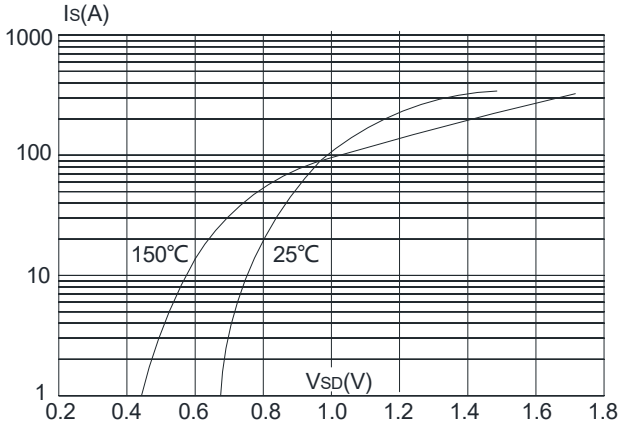


Figure 5: Gate Charge Characteristics

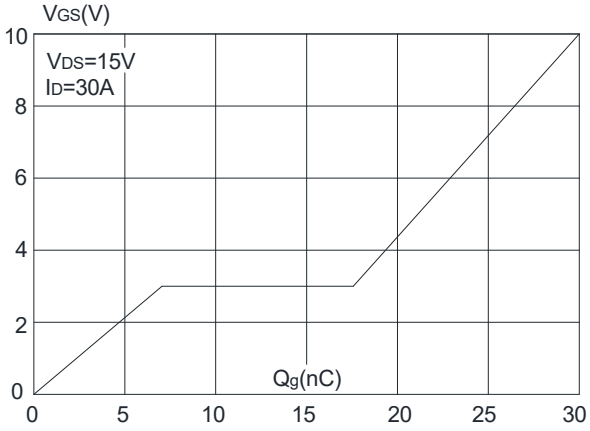
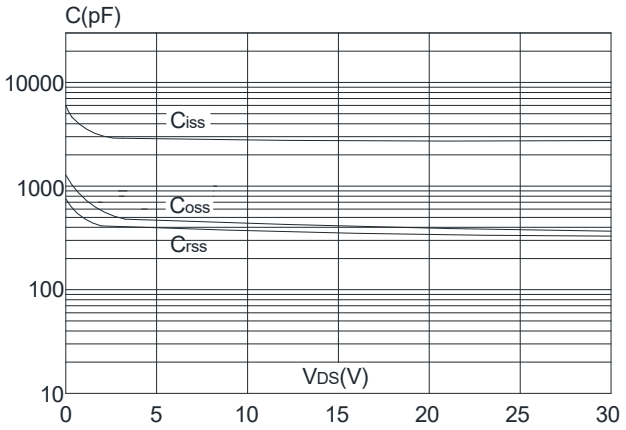


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

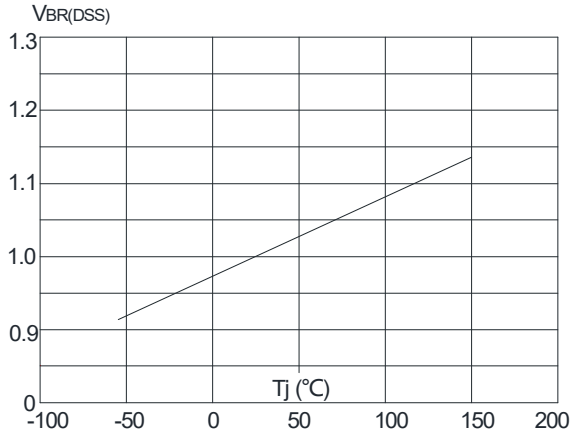


Figure 8: Normalized on Resistance vs. Junction Temperature

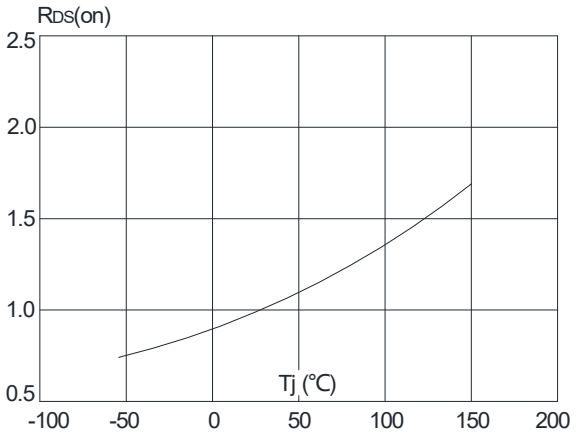


Figure 9: Maximum Safe Operating Area

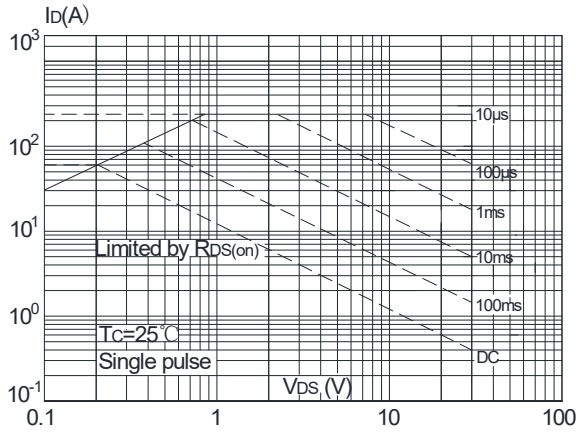


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

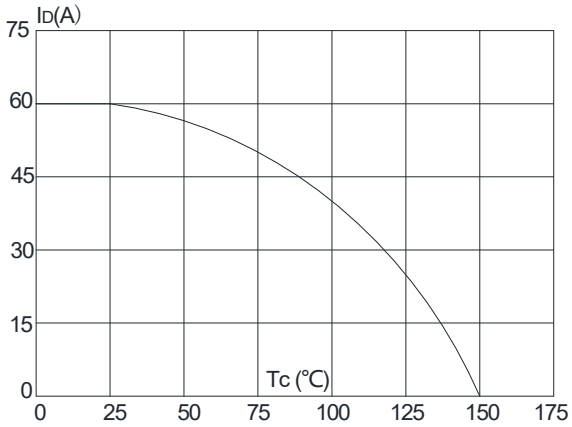
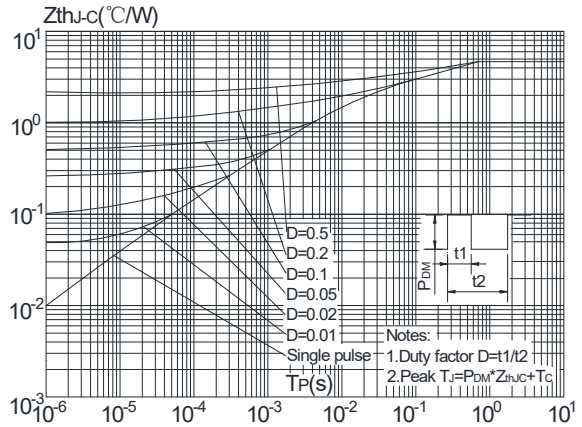


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

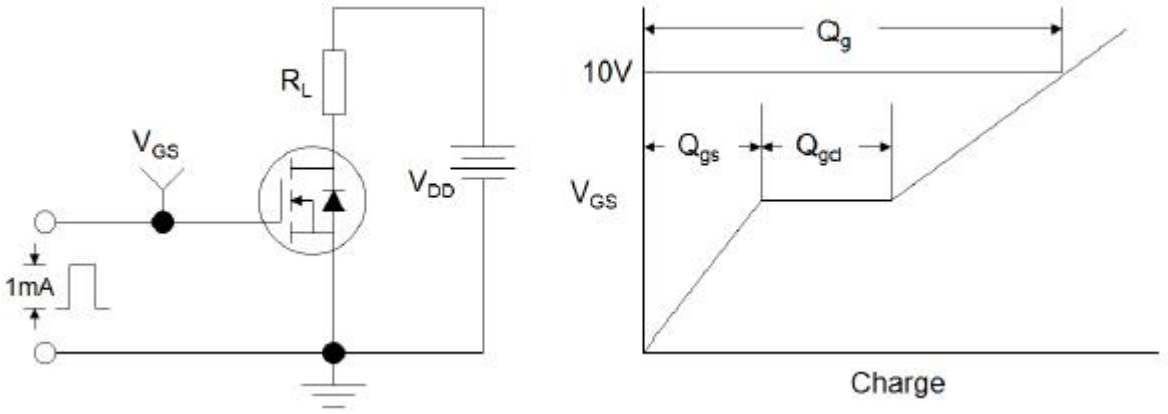


Figure1:Gate Charge Test Circuit & Waveform

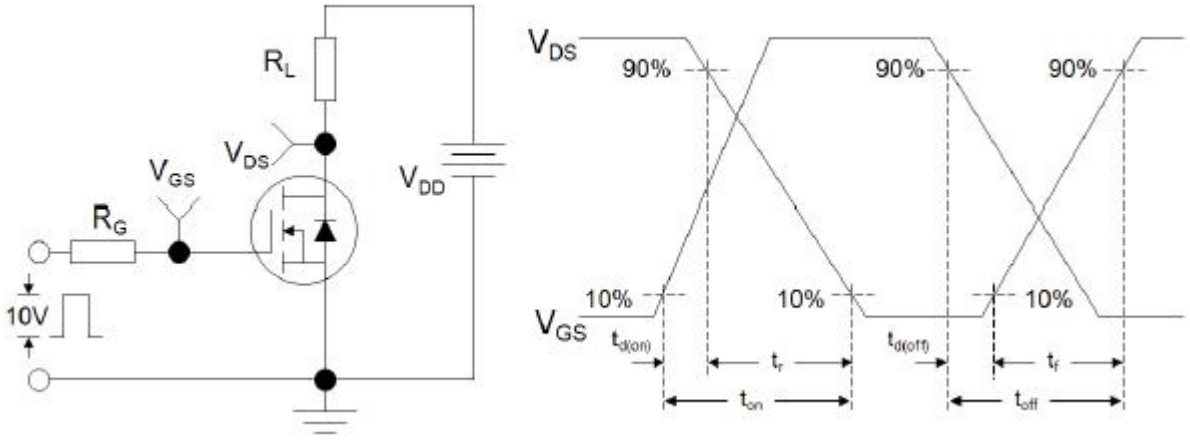


Figure 2: Resistive Switching Test Circuit & Waveforms

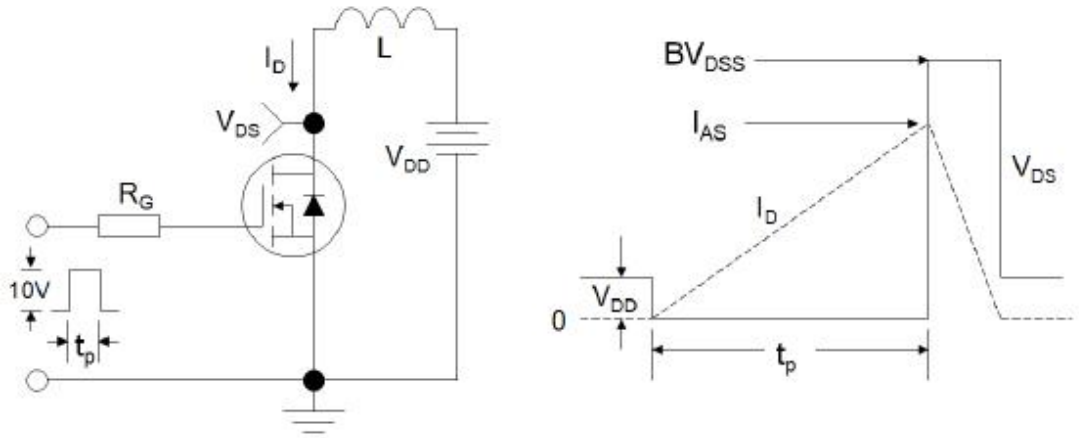
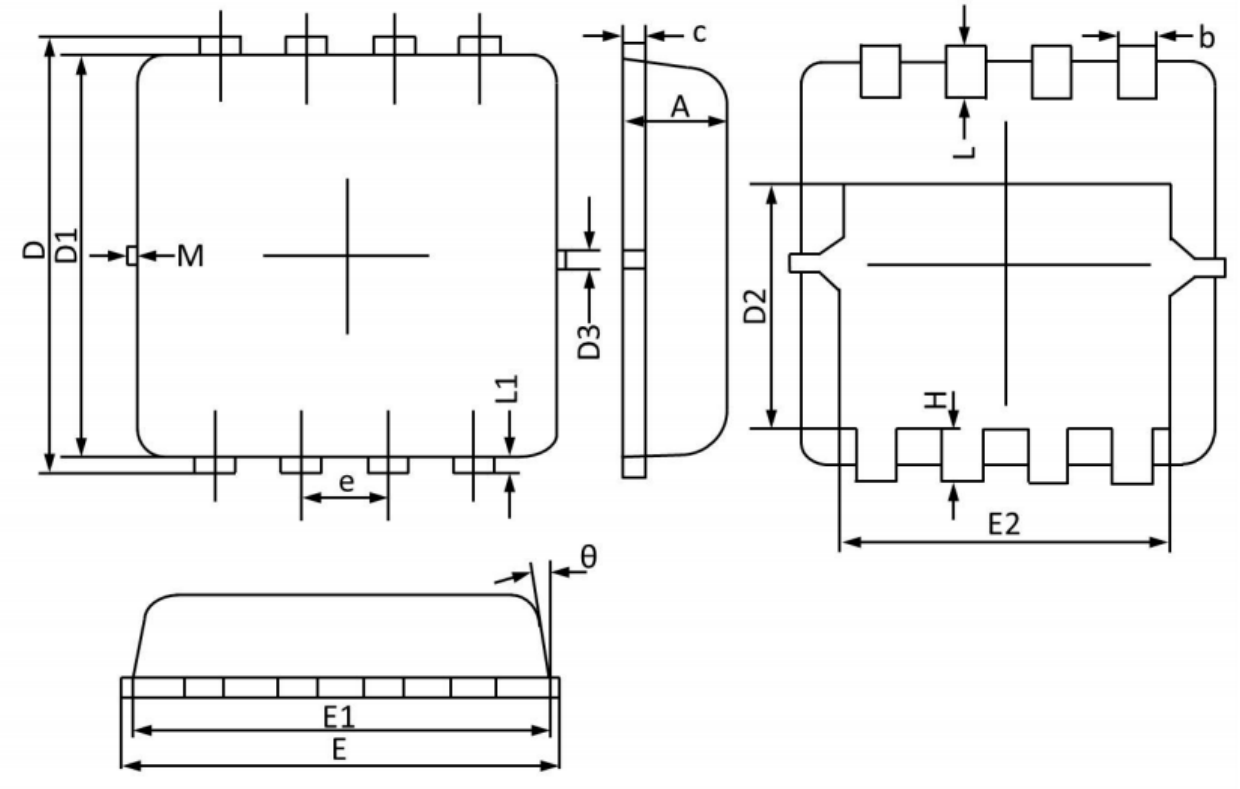


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

PDFN3X3-8L Package Information



DIMENSIONS

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	**b**	0.25	0.30	0.35
C	0.10	0.15	0.25	**D**	3.25	3.35	3.45
D1	3.00	3.10	3.20	**D2**	1.78	1.88	1.98
D3	--	0.13	--	**E**	3.20	3.30	3.40
E1	3.00	3.15	3.20	**E2**	2.39	2.49	2.59
e	0.65BSC			**H**	0.30	0.39	0.50
L	0.30	0.40	0.50	**L1**	--	0.13	--
θ	--	10°	12°	**M**	*	*	0.15