N-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	60	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	17	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	21	mΩ
I_D(T_A=25℃)	30	A

Features

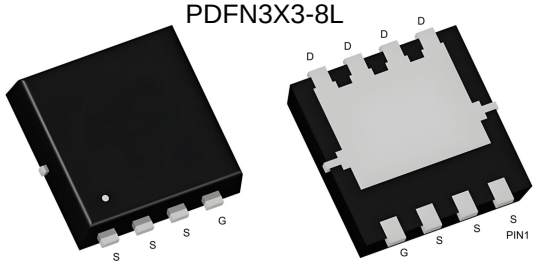
- Advanced Trench Technology
- Low $R_{DS(ON)}$

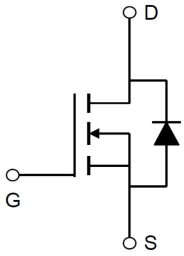
Applications

- Load switching
- PWM Applications
- Power Management

Pin Configuration

PDFN3X3-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAL30N06	PDFN3X3-8L	13″	5000pcs

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

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	30	A
		T_C=70℃	24	A
I_{DM}	Pulse Drain Current Tested [A]		152	A
E_{AS}	Single Pulse Avalanche Energy [B]		40	mJ
P_D	Power Dissipation	T_C=25℃	32	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	3.9	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to ambient max [C]	40	℃/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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1.0	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	--	2.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [D]	V_{GS}=10V,I_D=20A	--	17	24	mΩ
		V_{GS}=4.5V,I_D=15A	--	21	30	mΩ
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V	--	--	1.2	V
Dynamic Parameters [E]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=40V f=1MHZ	--	1650	--	pF
C_{oss}	Output Capacitance		--	73	--	pF
C_{rss}	Reverse Transfer Capacitance		--	67	--	pF
Q_g	Total Gate Charge	V_{DS}=40V,I_D=20A V_{GS}=10V	--	35.5	--	nC
Q_{gs}	Gate-Source Charge		--	4.6	--	nC
Q_{gd}	Gate-Drain Charge		--	8.8	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=40V ,R_G=5Ω, I_D=20A, V_{GS}=10V	--	9.1	--	ns
t_r	Turn-on Rise Time		--	13.7	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	36.5	--	ns
t_f	Turn-off Fall Time		--	15.6	--	ns

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

B. EAS condition: T_J=25℃,V_{DD}=50V, V_G=10V, L=0.5mH.

C. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 2OZ copper.

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

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

Typical Characteristics

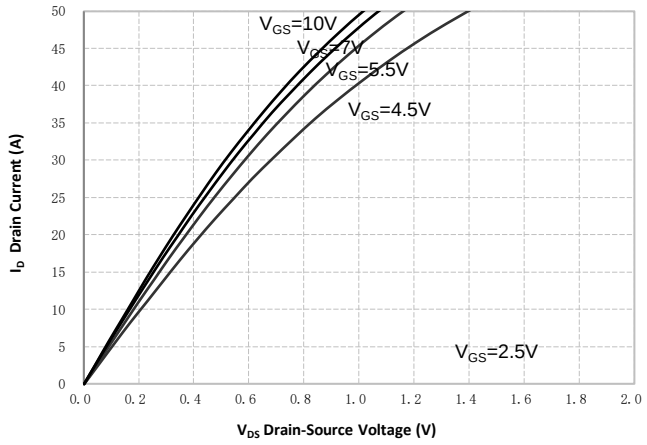


Figure 1. On-Region Characteristics

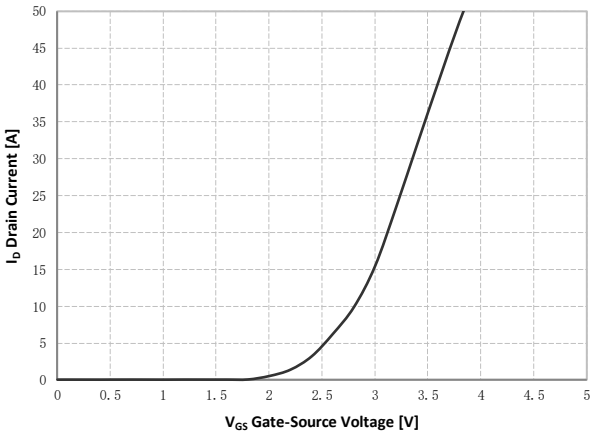


Figure 2. Transfer Characteristics

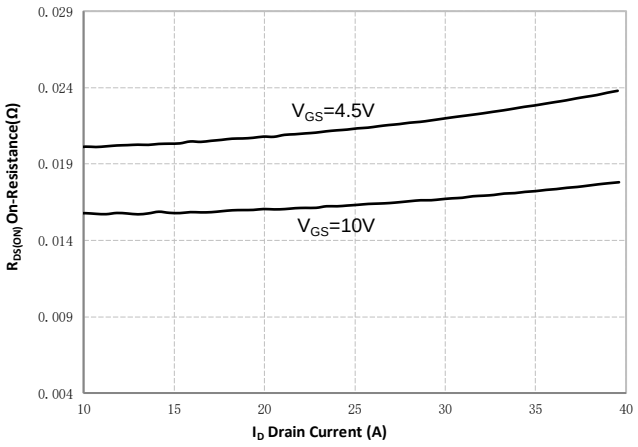


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

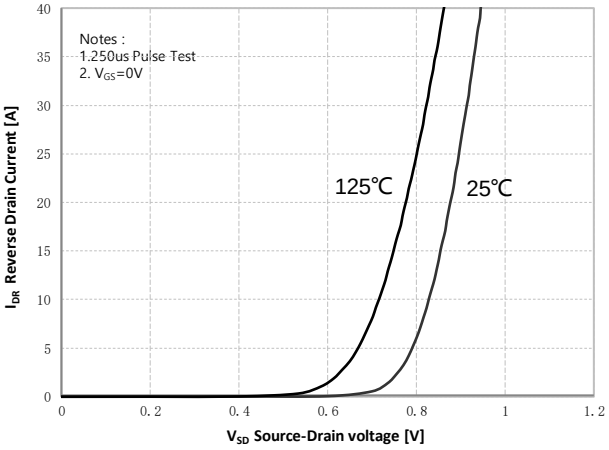


Figure 4. Body Diode Forward Voltage Variation with Source Current

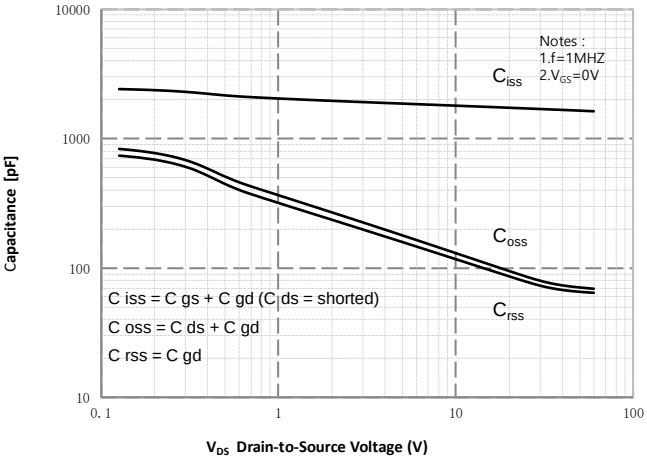


Figure 5. Capacitance Characteristics

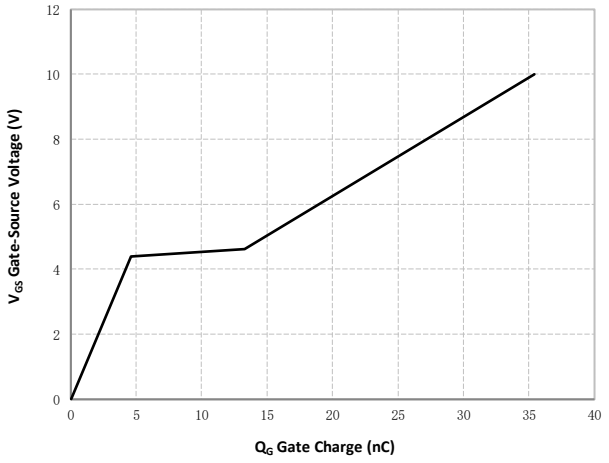


Figure 6. Gate Charge Characteristics

Typical Characteristics

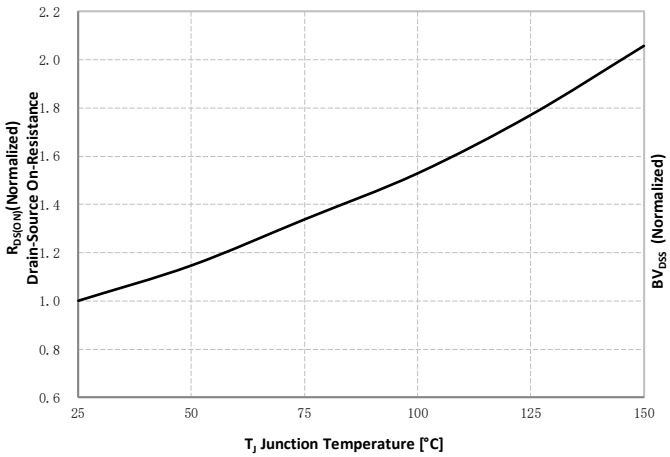


Figure 7. On-Resistance Variation vs Temperature

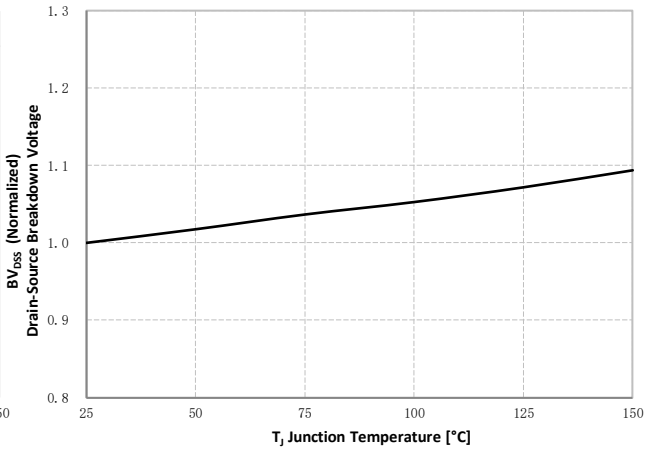


Figure 8. Breakdown Voltage Variation vs Temperature

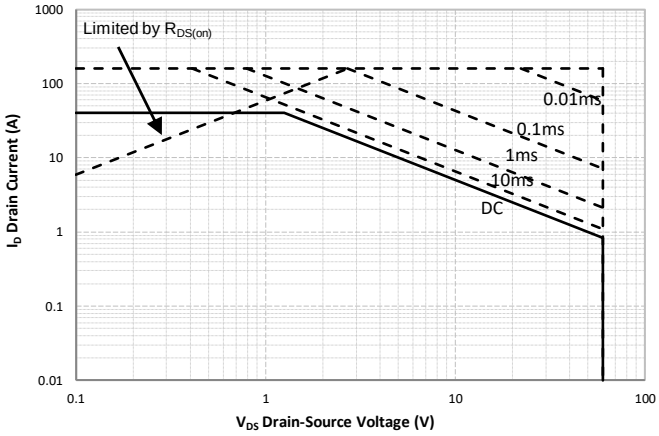


Figure 9. Maximum Safe Operating Area 3)

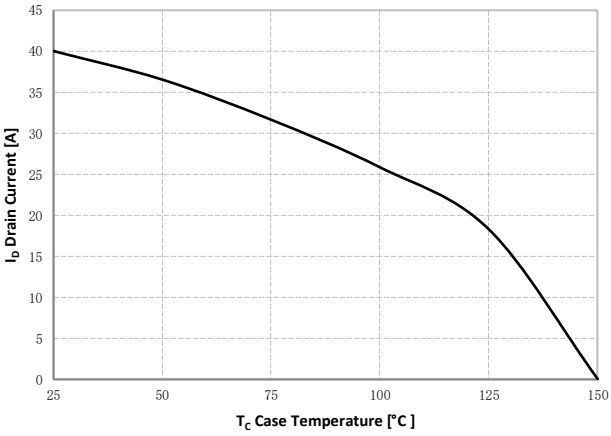


Figure 10. Maximum Continuous Drain Current vs Case Temperature

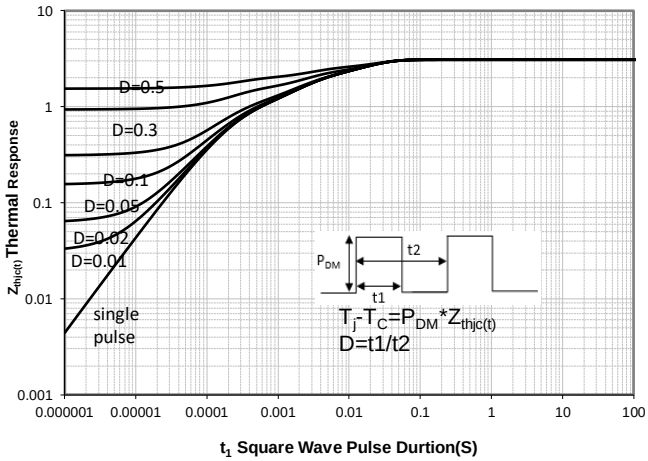
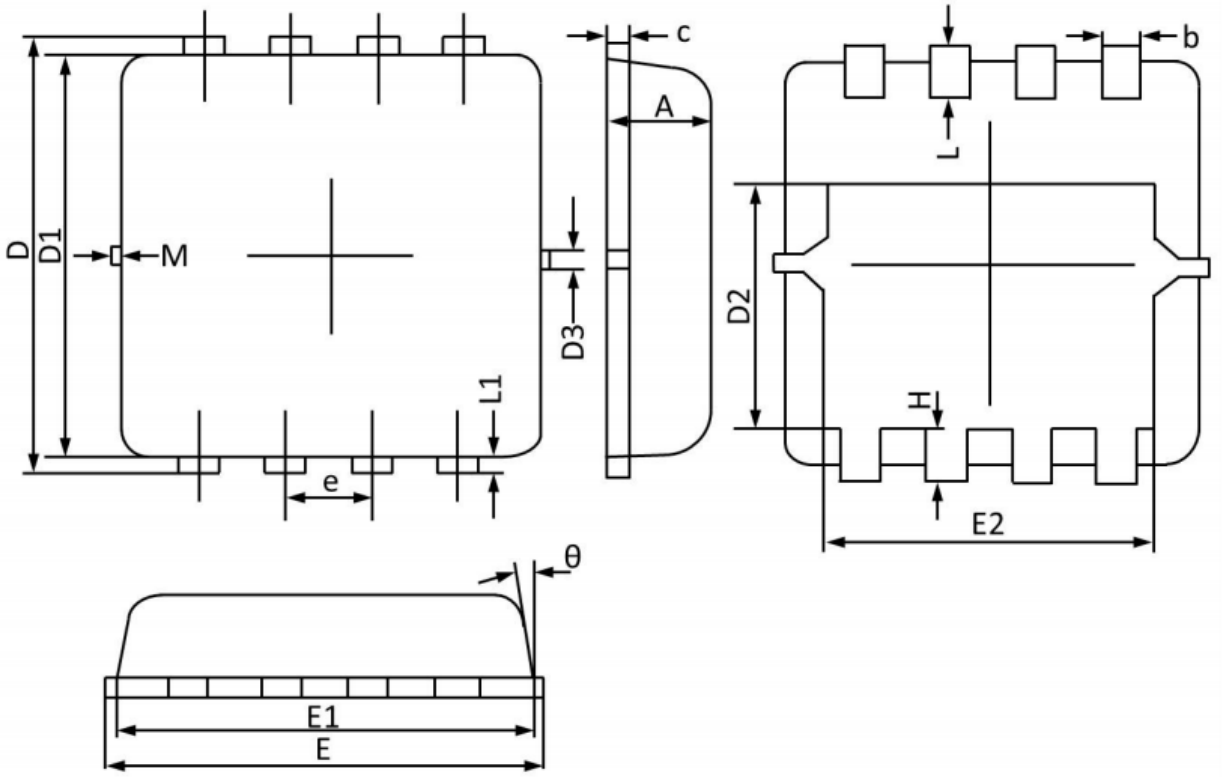


Figure 11. Transient Thermal Response Curve

PDFN3X3-8L Package Information (unit:mm)



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