N-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	60	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	3.9	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	5.0	mΩ
I_D(Tc=25℃)	98	A

Features

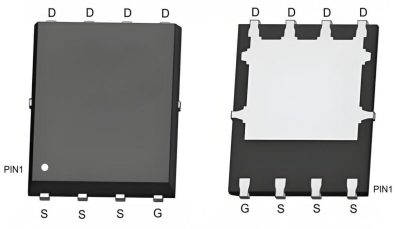
- High Current Capability
- Low Gate Charge
- Ultra-low $R_{DS(ON)}$

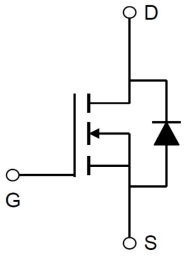
Applications

- Power management functions
- Load switching

Pin Configuration

PDFN5X6-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAP98N06A	PDFN5X6-8L	13″	3000pcs

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 [A]	T_C=25℃	98	A
		T_C=100℃	62	A
I_{DM}	Pulse Drain Current Tested [B]		360	A
I_{AS}	Avalanche Current [C]		27	A
E_{AS}	Single Pulse Avalanche Energy [C]		109	mJ
P_D	Power Dissipation @T_C=25℃ [D]		78	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	1.6	℃/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}=48V,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	1.2	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=10V,I_D=20A	--	3.9	4.9	mΩ
		V_{GS}=4.5V,I_D=15A	--	5.0	6.3	mΩ
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V	--	--	1.0	V
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=20A	--	121	--	S
I_S	Diode Continuous Current	T_C=25℃	--	--	121	A
Rg	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	--	1.78	--	Ω
Dynamic Parameters [E]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=30V f=1MHZ	--	2030	--	pF
C_{oss}	Output Capacitance		--	445	--	pF
C_{rss}	Reverse Transfer Capacitance		--	4.4	--	pF
Q_g	Total Gate Charge (@V_{GS}=10V)	V_{DS}=30V,I_D=20A V_{GS}=0 to 10V	--	32	--	nC
Q_g	Total Gate Charge (@V_{GS}=4.5V)		--	14.9	--	nC
Q_{gs}	Gate-Source Charge		--	4.4	--	nC
Q_{gd}	Gate-Drain Charge		--	4.9	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=30V ,R_{GEN}=6Ω, R_L=1.5Ω, V_{GS}=10V	--	6.3	--	ns
t_r	Turn-on Rise Time		--	7.8	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	39	--	ns
t_f	Turn-off Fall Time		--	15.5	--	ns
t_{rr}	Reverse recovery time	I_F=20A, di/dt=100 A/uS	--	39	--	ns
Q_{rr}	Reverse recovery charge		--	45	--	uC

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. This single-pulse measurement was taken under the following condition [L=300uH, V_{GS}=10V, V_{DS}=30V] while its value is limited by TJ_Max=150℃.

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

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

F. Continuous current rating is limited by the package used.

Typical Characteristics

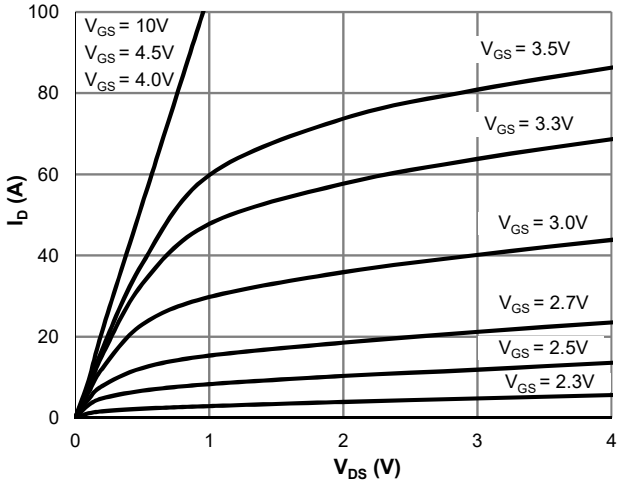


Figure 1: Saturation Characteristics

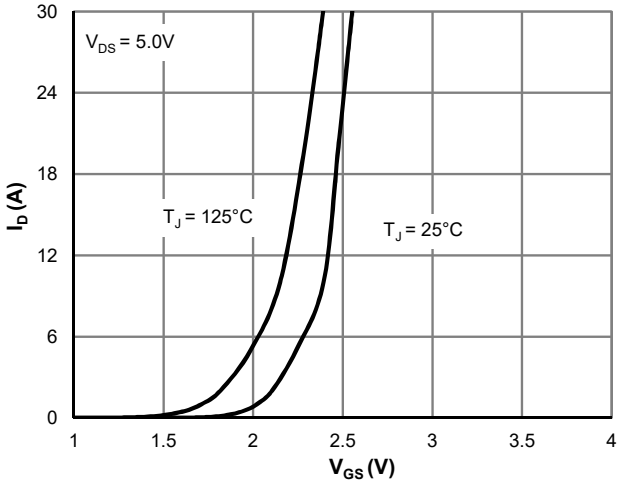


Figure 2: Transfer Characteristics

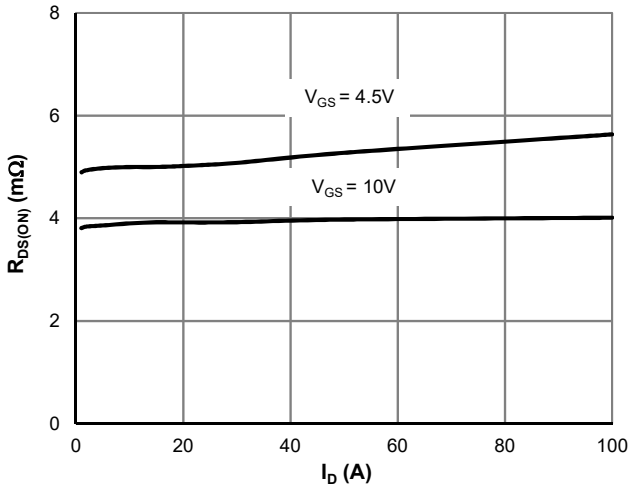


Figure 3: $R_{DS(ON)}$ vs. Drain Current

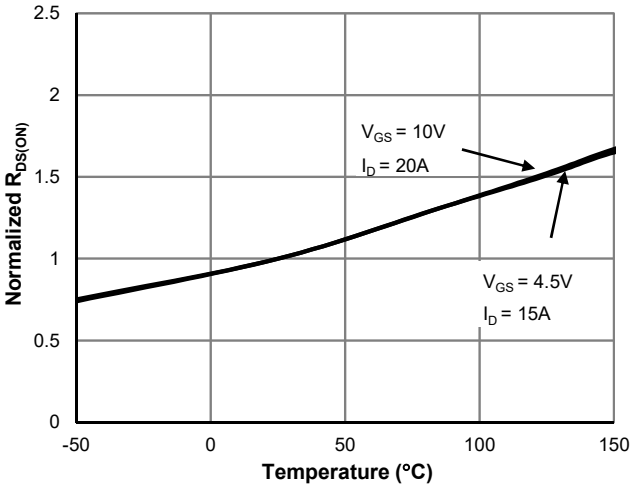


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

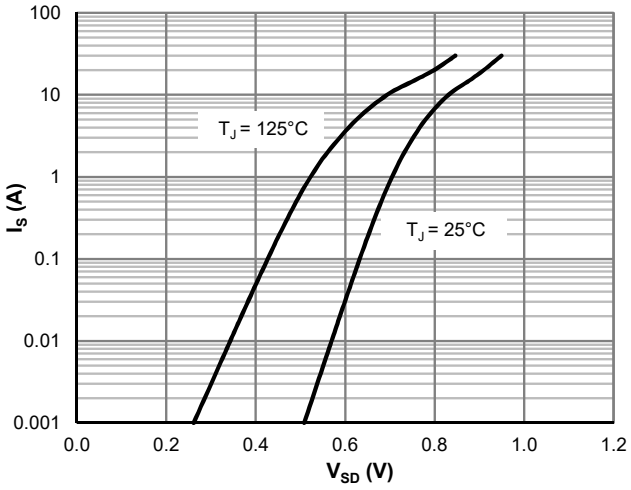


Figure 5: Body-Diode Characteristics

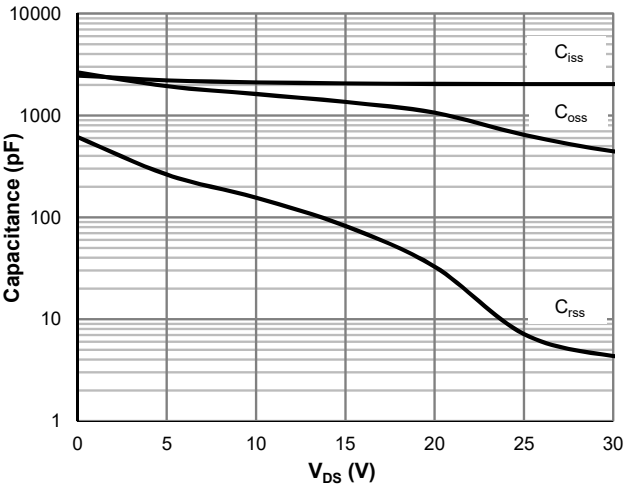


Figure 6: Capacitance Characteristics

Typical Characteristics

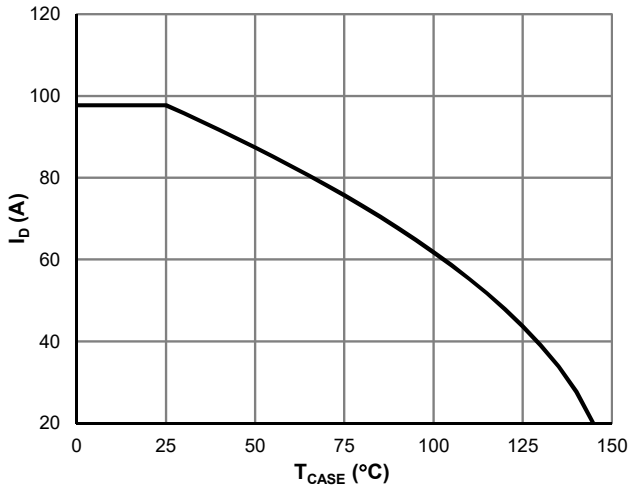


Figure 7: Current De-rating

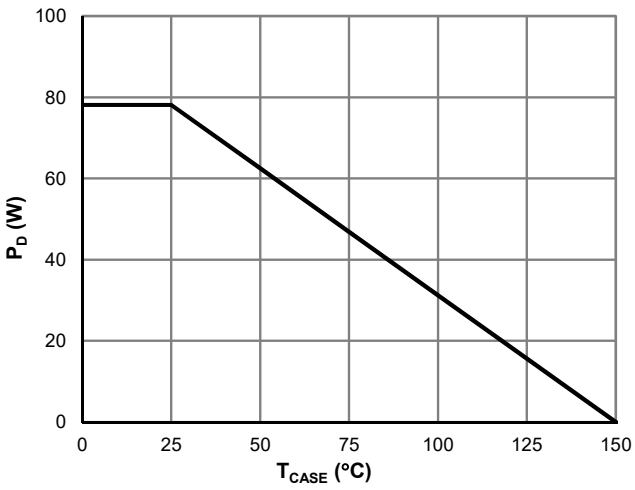


Figure 8: Power De-rating

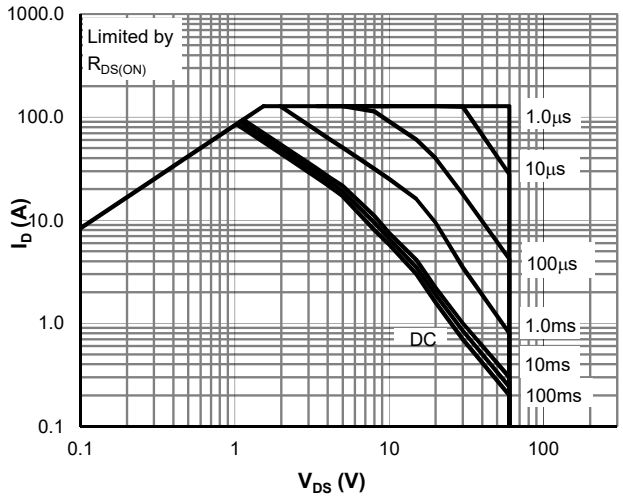


Figure 9: Maximum Safe Operating Area

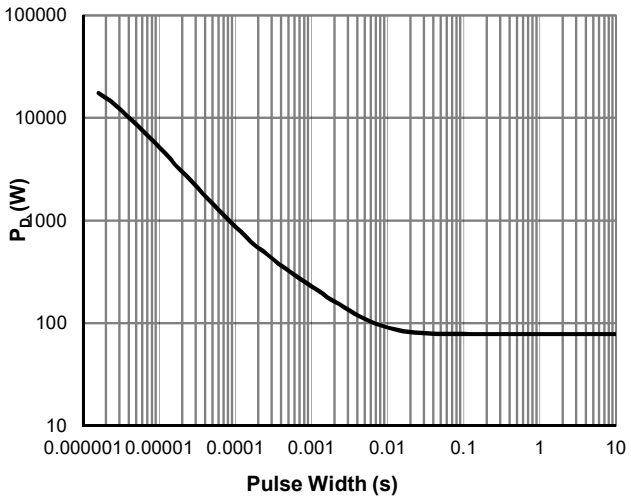


Figure 10: Single Pulse Power Rating, Junction-to-Case

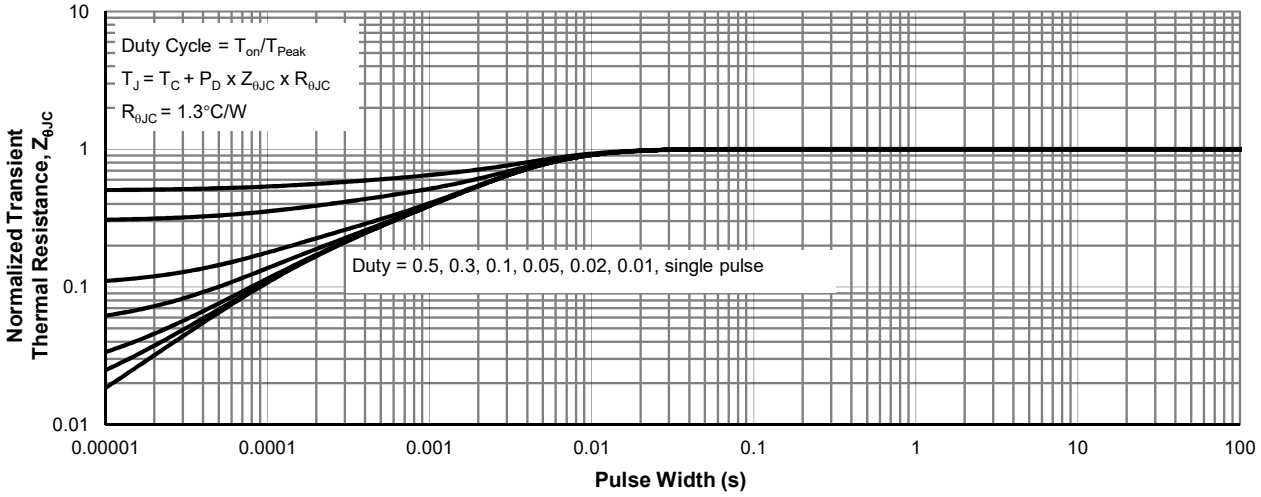
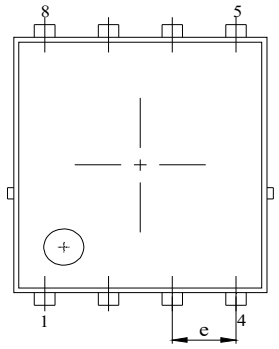
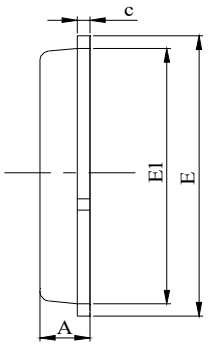


Figure 11: Normalized Maximum Transient Thermal Impedance

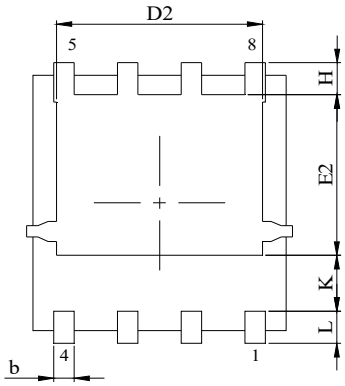
PDFN5X6-8L Package Information (unit:mm)



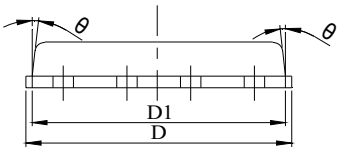
Top View



Side View



Bottom View



Front View

NOTES:
1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).
3. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

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°