

P-Channel 30V(D-S) MOSFET

Product summary

V_{DS}	-30	V
$R_{DS(ON)}$ (at $V_{GS}=-10V$) Typ.	6	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$) Typ.	9.5	m Ω
I_D ($T_C=25^{\circ}C$)	-70	A

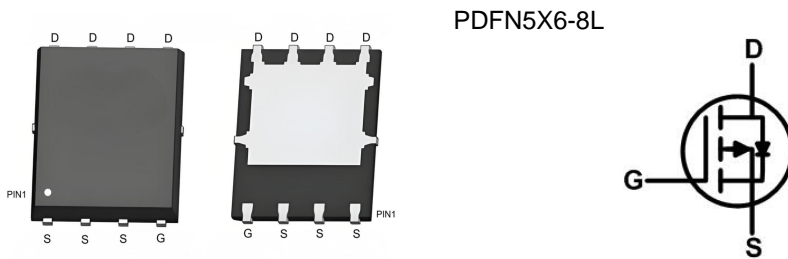
Features

- Trench Power LV MOSFET technology
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching

Applications

- Load switching
- Battery management

Pin Configuration



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAP70P03S	PDFN5X6-8L	13"	5000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ 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℃	-70	A
		T _C =100℃	-50	A
I _{DM}	Pulse Drain Current Tested ^B		-200	A
E _{AS}	Single Pulse Avalanche Energy ^C		80	mJ
P _D	Power Dissipation	T _C =25℃	90	W
T _J ,T _{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient ^D	50	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to case max	1.4	$^{\circ}C/W$

Electrical Characteristics (at $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	--	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^B	$V_{GS}=-10V, I_D=-20A$	--	6	7.2	m Ω
		$V_{GS}=-4.5V, I_D=-15A$	--	9.5	12	m Ω
V_{SD}	Diode Forward Voltage ^B	$I_S=-1A, V_{GS}=0V$	--	--	-1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	-70	A
Dynamic Parameters ^E						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-25V$ $f=1\text{MHz}$	--	3450	--	pF
C_{oss}	Output Capacitance		--	255	--	pF
C_{rss}	Reverse Transfer Capacitance		--	140	--	pF
Q_g	Total Gate Charge	$V_{DD}=-15V, I_D=-18A$ $V_{GS}=-10V$	--	60	--	nC
Q_{gs}	Gate-Source Charge		--	9	--	nC
Q_{gd}	Gate-Drain Charge		--	15	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=-15V$ $V_{GS}=-10V$, $R_G=3.3\Omega$, $I_D=-20A$	--	17	--	ns
t_r	Turn-on Rise Time		--	40	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	55	--	ns
t_f	Turn-off Fall Time		--	13	--	ns
t_{rr}	Reverse recovery time	$I_F=-20A$, $di/dt=100\text{ A/uS}$	--	22	--	ns
Q_{rr}	Reverse recovery charge		--	72	--	nC

Note:

A. The maximum current rating is package limited.

B. The data tested by pulsed, Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

C. The EAS data shows Max. rating . The test condition is $V_{DD}=-50V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-40A$.

D. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

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

Typical Characteristics

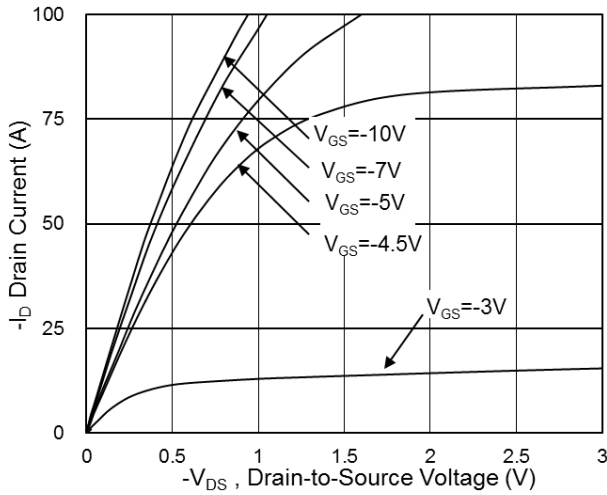


Fig.1 Typical Output Characteristics

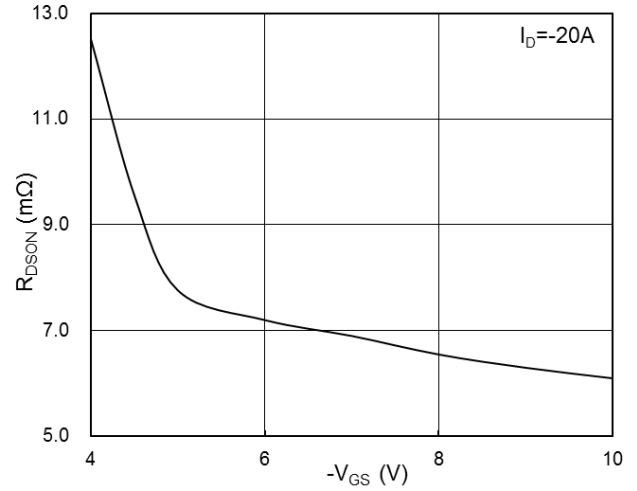


Fig.2 On-Resistance vs. Gate-Source Voltage

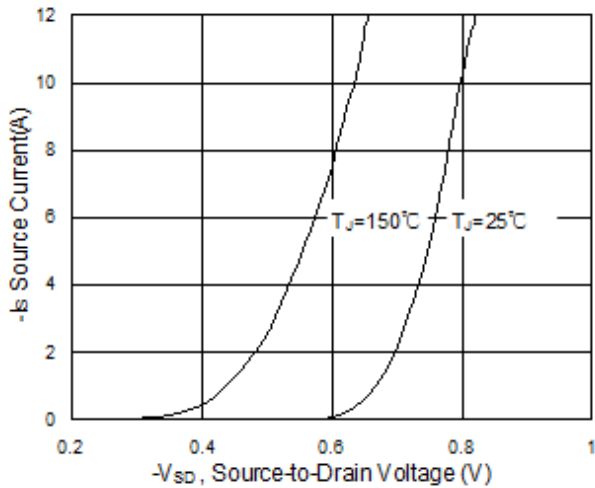


Fig.3 Forward Characteristics of Reverse

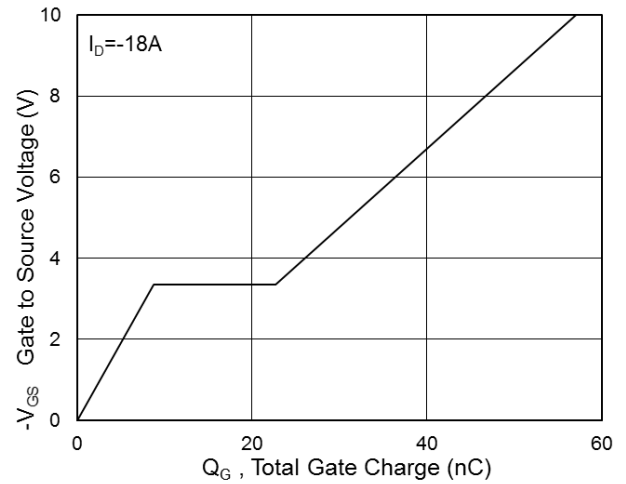


Fig.4 Gate-Charge Characteristics

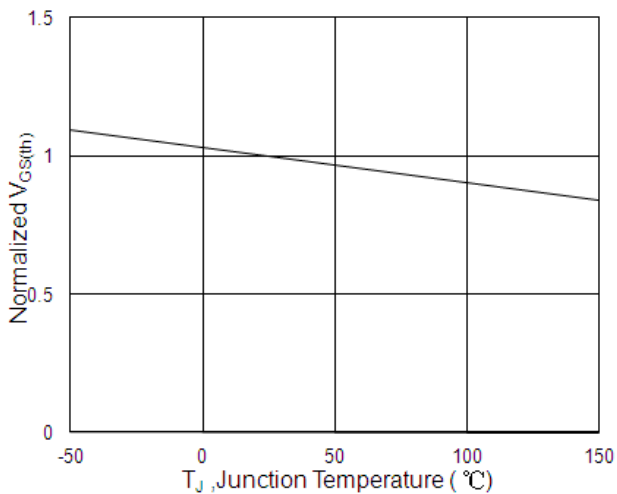


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

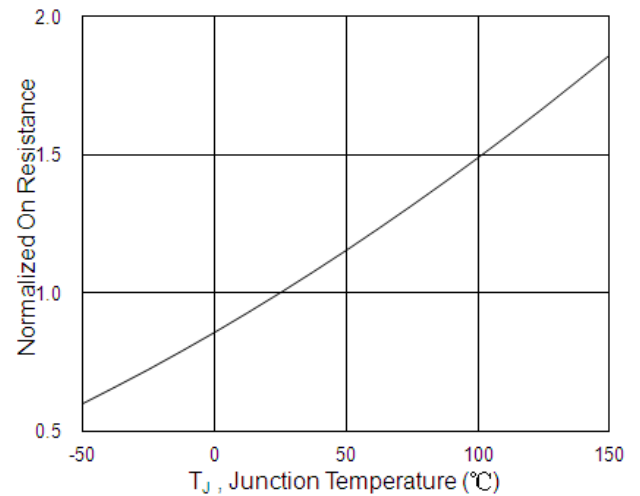


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

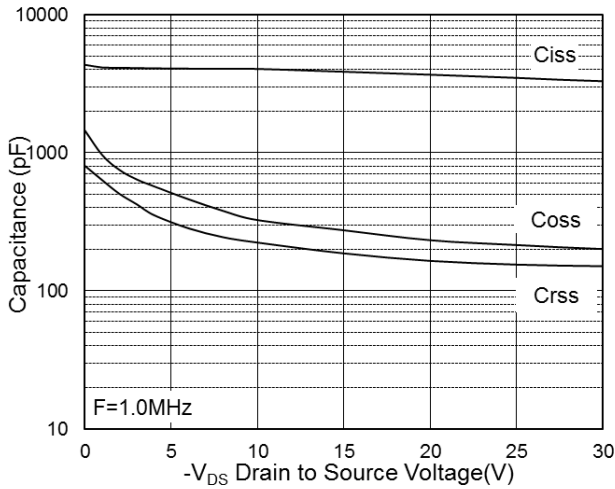


Fig.7 Capacitance

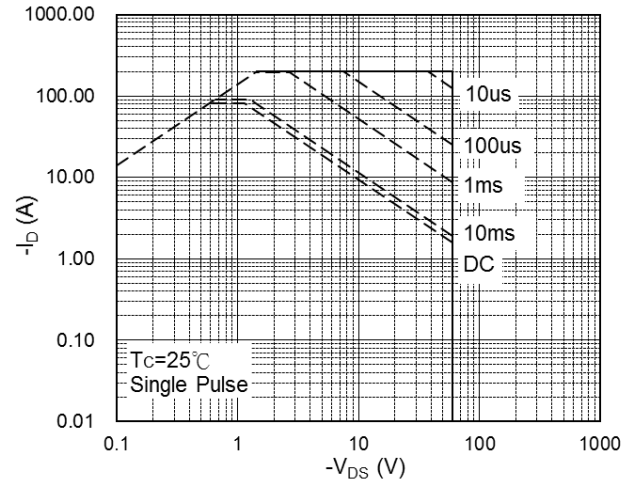


Fig.8 Safe Operating Area

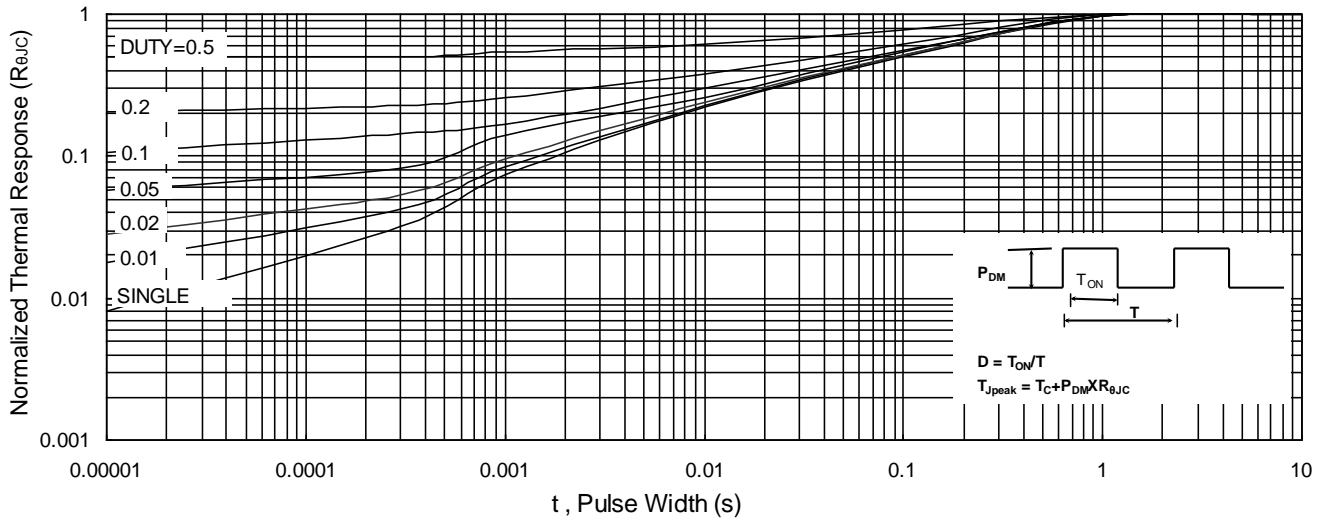


Fig.9 Normalized Maximum Transient Thermal Impedance

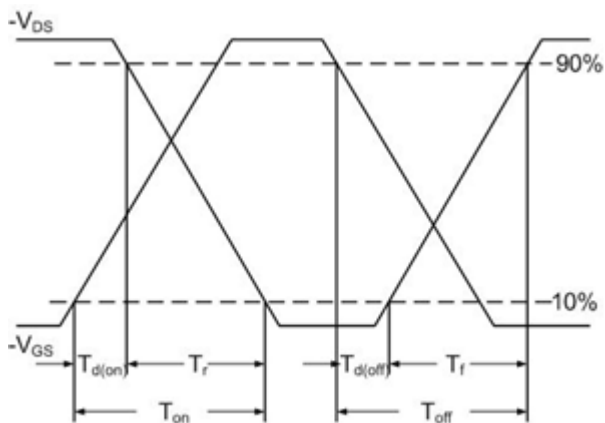


Fig.10 Switching Time Waveform

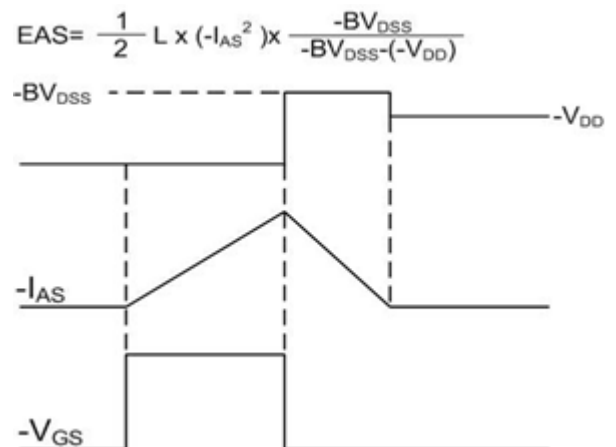
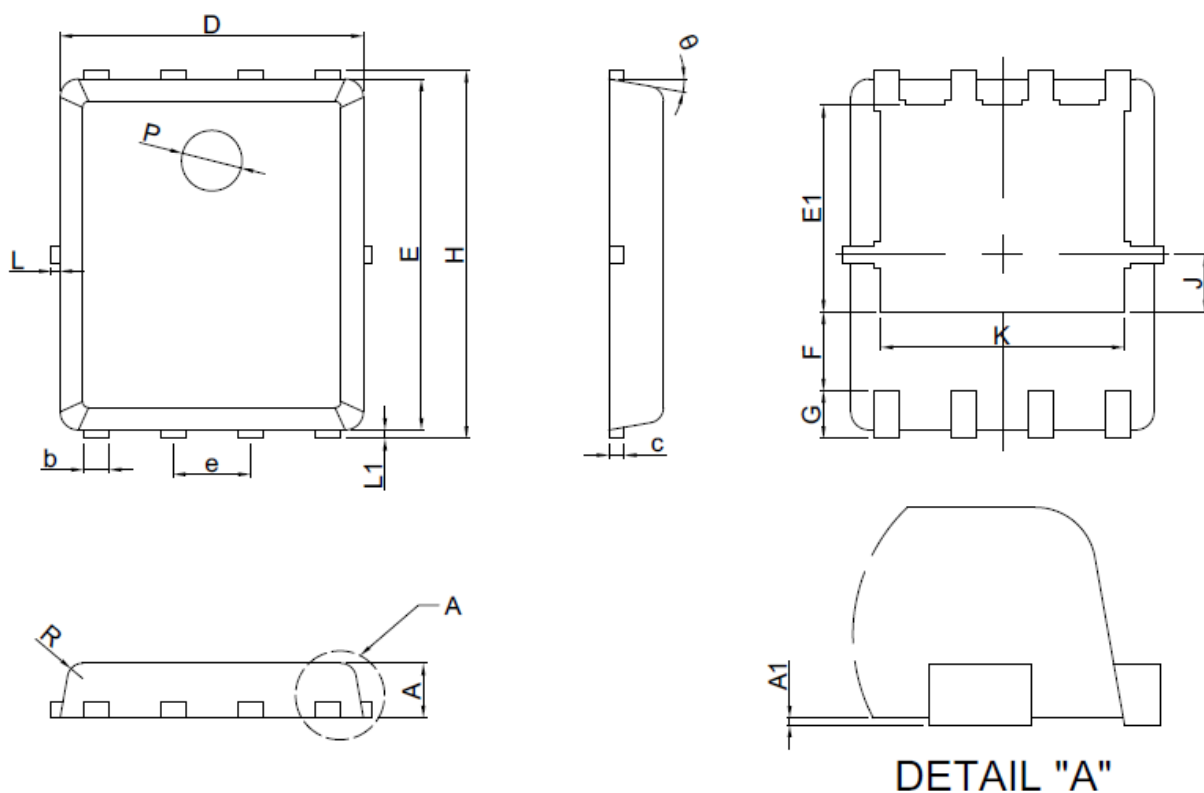


Fig.11 Unclamped Inductive Switching Waveform

PDFN5X6-8L Package Information



SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A ₁	0.00	0.03	0.05
b	0.35	0.42	0.49
c	0.254REF		
D	4.90	5.00	5.10
F	1.40REF		
E	5.70	5.80	5.90
e	1.27BSC		
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G	0.60REF		
K	4.00REF		
L	—	—	0.15
J	0.95BSC		
P	1.00REF		
E1	3.40REF		
θ	6°	10°	14°
R	0.25REF		