

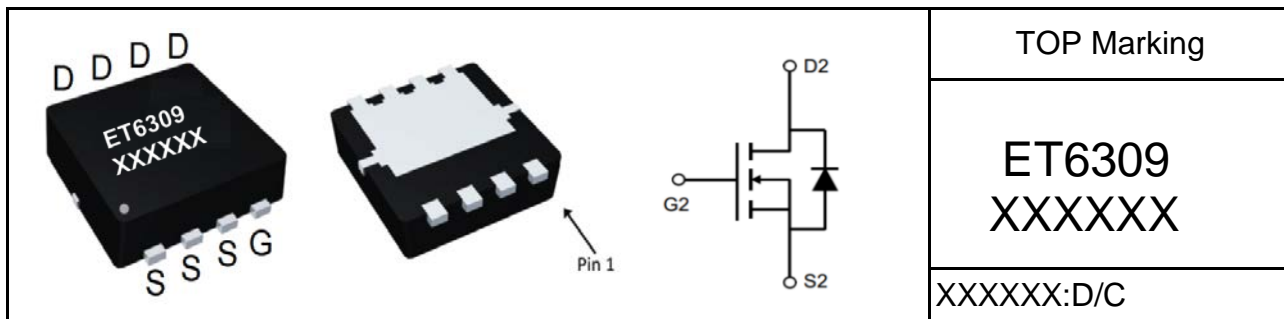
### N-Channel Fast Switching MOSFET (30V, 100A)

#### PRODUCT SUMMARY

$V_{DSS}$	$I_D$	$R_{DS(on)}$ (m $\Omega$ ) Max
30V	100A	4 @ $V_{GS} = 10V, I_D=30A$
		6 @ $V_{GS} = 4.5V, I_D=15A$

#### Features

- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trenchtechnology
- 100% EAS Guaranteedtechnology
- Lead (Pb) -free and halogen-free



#### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current (Continuous) @ $T_A=25^\circ\text{C}$	100	A
	Drain Current (Continuous) @ $T_A=75^\circ\text{C}$	65	A
$I_{DM}$	Drain Current (Pulsed) <sup>a</sup>	200	A
$P_D$	Total Power Dissipation @ $T_A=25^\circ\text{C}$	2	W
	Total Power Dissipation @ $T_A=75^\circ\text{C}$	5	W
EAS	Avalanche energy, single pulsed <sup>b</sup>	140	mj
$I_S$	Maximum Diode Forward Current	100	A
$T_j, T_{stg}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{QJA}$	Thermal Resistance Junction to Ambient (PCB mounted) <sup>c</sup>	60	$^\circ\text{C/W}$

a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: Limited by  $T_{jmax}$ , starting  $T_j = 25^\circ\text{C}$ ,  $L = 0.5\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 10\text{A}$ ,  $V_{GS} = 10\text{V}$ . Part not recommended for use above this value

c: 1-in2 2oz Cu PCB board

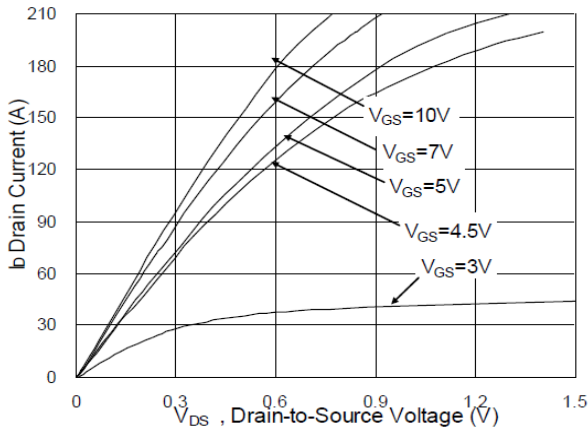


### Electrical Characteristics (T<sub>A</sub>=25°C, unless otherwise noted)

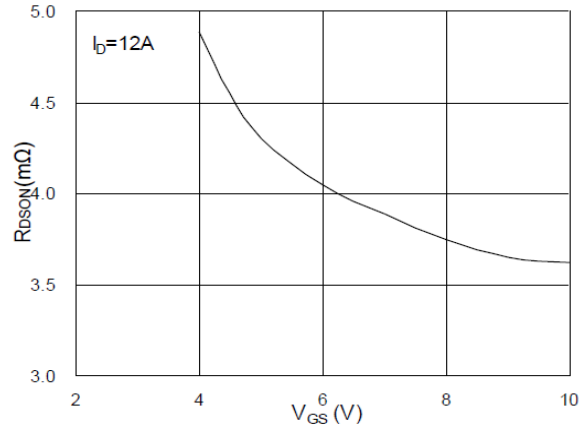
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
<b>• Off Characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	0	-	1	μA
	Zero Gate Voltage Drain Current (T <sub>j</sub> =125°C)	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	0	-	100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>• On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.2	1.8	2.4	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	-	4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A	-	-	6	
<b>• Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	-	3050	-	PF
C <sub>oss</sub>	Output Capacitance		-	405	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	300	-	
<b>• Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =15A, V <sub>GS</sub> =10V	-	30	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	8	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	12	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =3.3Ω, I <sub>D</sub> =15A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω	-	9	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	18	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	55	-	
t <sub>f</sub>	Turn-off Fall Time		-	15	-	
<b>• Drain-Source Diode Characteristics</b>						
V <sub>SD</sub>	Drain-Source Diode Forward	V <sub>GS</sub> =0V, I <sub>S</sub> =15A	-	0.84	1	V

Note: Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%

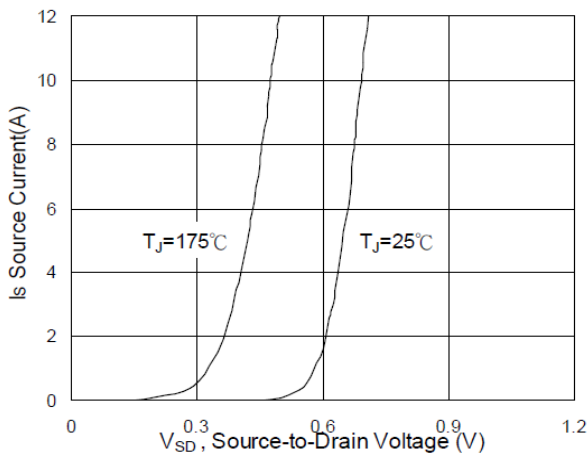
### Typical Characteristics Curves (Ta=25°C, unless otherwise note)



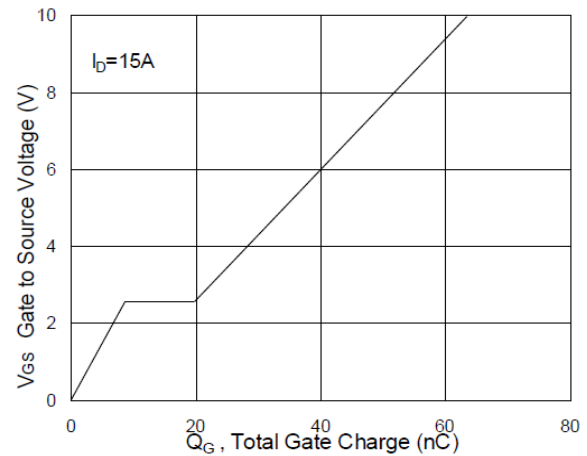
**Fig.1 Typical Output Characteristics**



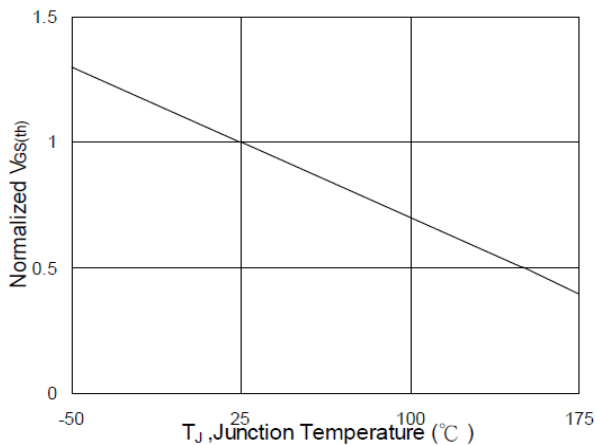
**Fig.2 On-Resistance vs. G-S Voltage**



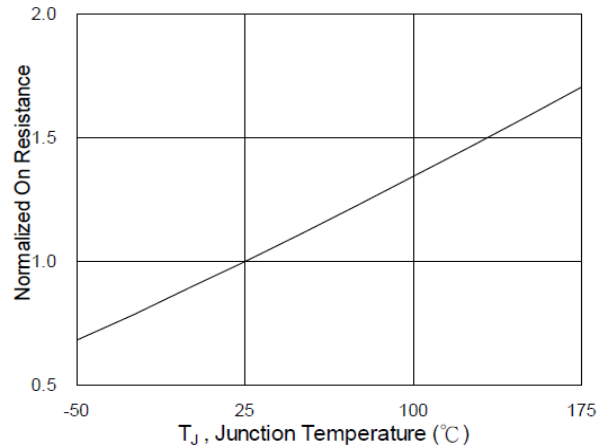
**Fig.3 Forward Characteristics of Reverse**



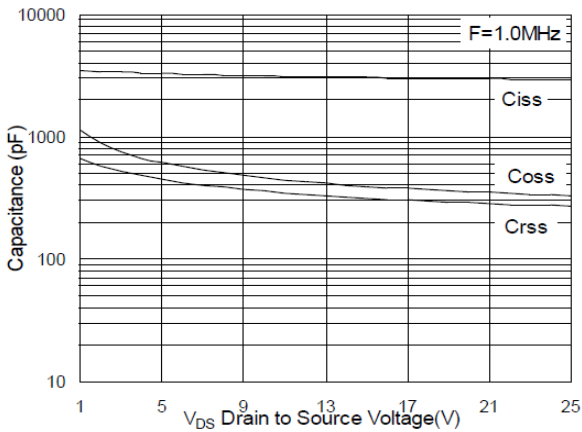
**Fig.4 Gate-charge Characteristics**



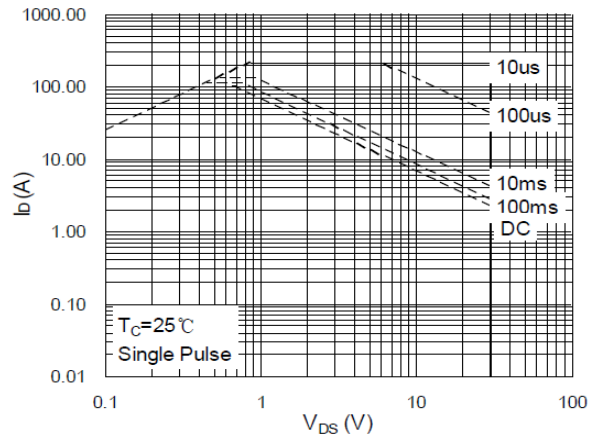
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



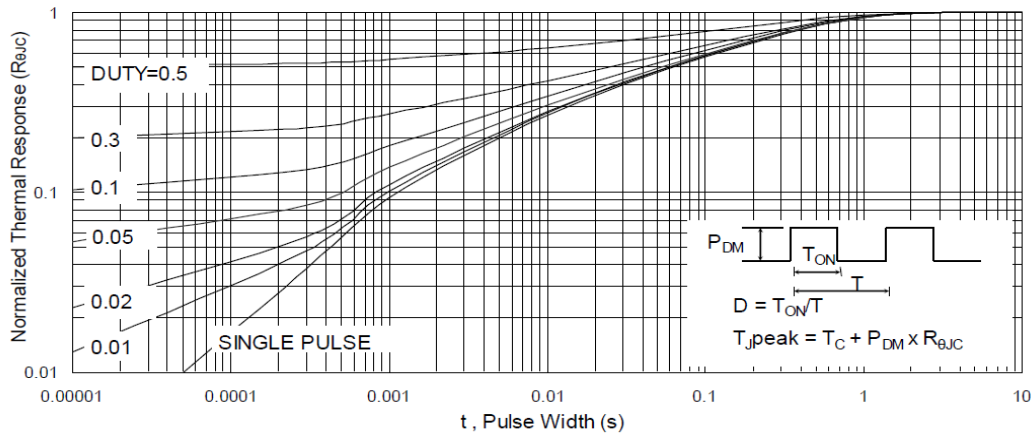
**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**



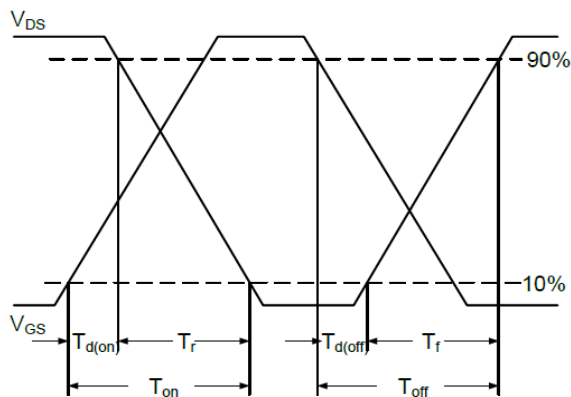
**Fig.7 Capacitance**



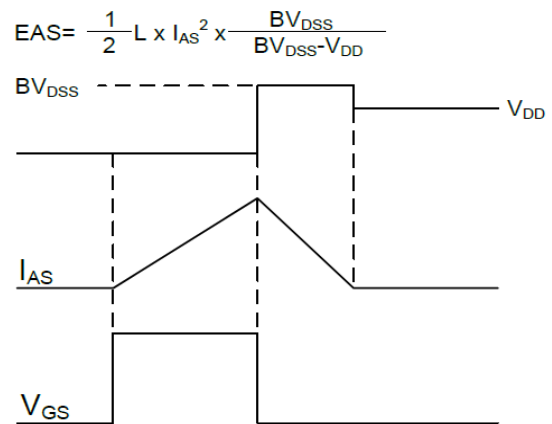
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

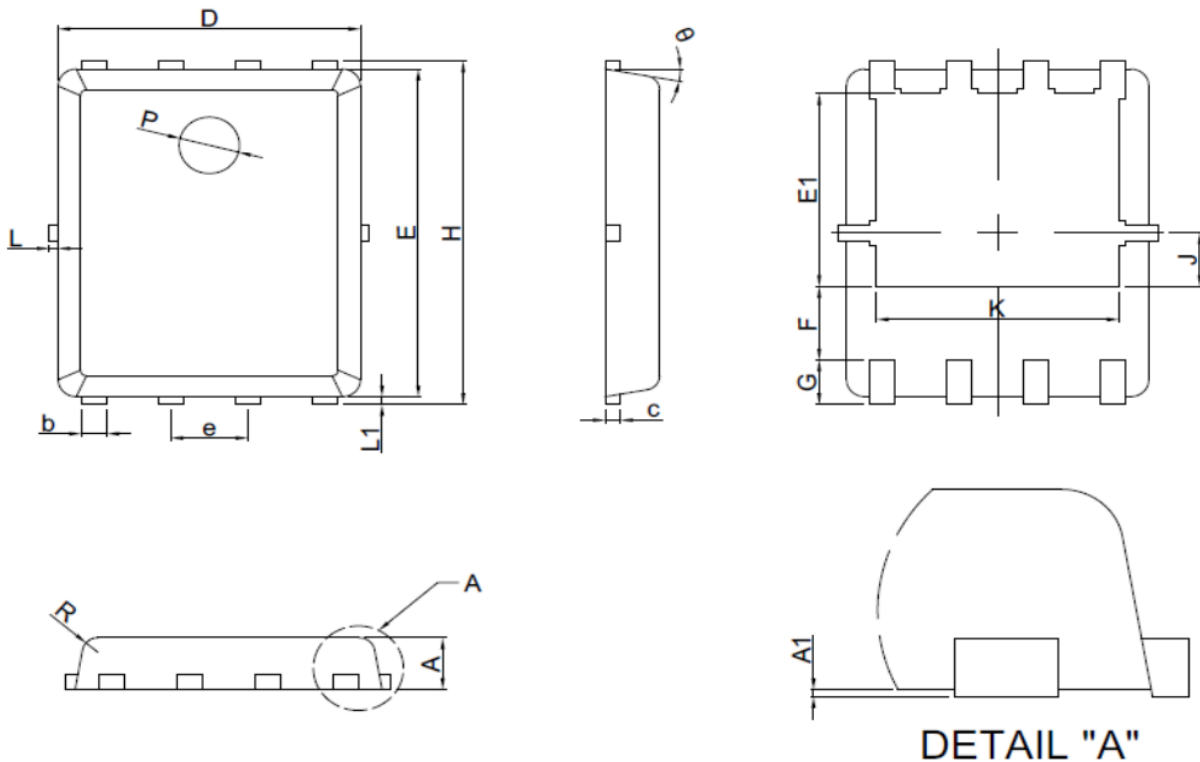


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

### PRPAK5x6-8L Package Outline



Symbol	Dimensions (unit : mm)		
	Min	TYP	Max
A	0.80	0.90	1.00
A1	0.00	0.03	0.05
b	0.35	0.42	0.49
c	0.254REF		
D	4.90	5.00	5.10
F	1.4REF		
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	0.85BSC		
P	1.00REF		
θ	6°	10°	14°
E1	3.40REF		
R	0.25REF		