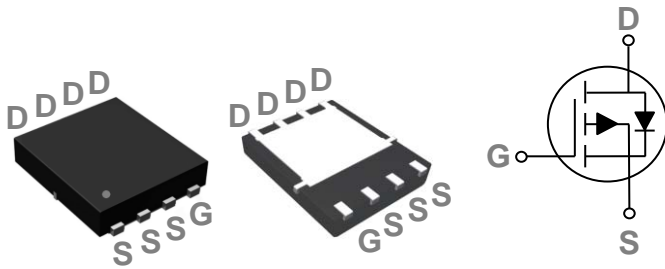


100V P-Channel MOSFETs

General Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

PPAK5X6 Pin Configuration



BVDSS	RDS(ON)	ID
-100V	46mΩ	-30A

Features

- -100V,-30A, RDS(ON) 46mΩ @VGS = -10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _C =25°C)	-30	A
	Drain Current – Continuous (T _C =100°C)	-19	A
I _{DM}	Drain Current – Pulsed ¹	-120	A
EAS	Single Pulse Avalanche Energy ²	180	mJ
IAS	Single Pulse Avalanche Current ²	-60	A
P _D	Power Dissipation (T _C =25°C)	135	W
	Power Dissipation – Derate above 25°C	1.09	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance Junction to Case	---	0.92	°C/W
R _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W



100V P-Channel MOSFETs

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.06	---	V/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-80V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-15A$	---	38	46	m Ω
		$V_{GS}=-4.5V, I_D=-10A$	---	42	55	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-0.46	---	mV/ $^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$	---	22	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{3,4}	$V_{DS}=-50V, V_{GS}=-10V, I_D=-10A$	---	98	150	nC
Q_{gs}	Gate-Source Charge ^{3,4}		---	16.2	30	
Q_{gd}	Gate-Drain Charge ^{3,4}		---	13.8	26	
$T_{d(on)}$	Turn-On Delay Time ^{3,4}	$V_{DD}=-50V, V_{GS}=-10V, R_G=25\Omega$ $I_D=-5A$	---	58	105	ns
T_r	Rise Time ^{3,4}		---	24	50	
$T_{d(off)}$	Turn-Off Delay Time ^{3,4}		---	215	450	
T_f	Fall Time ^{3,4}		---	94	180	
C_{iss}	Input Capacitance	$V_{DS}=-50V, V_{GS}=0V, F=1\text{MHz}$	---	6180	12000	pF
C_{oss}	Output Capacitance		---	160	320	
C_{rss}	Reverse Transfer Capacitance		---	98	200	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-30	A
I_{SM}	Pulsed Source Current		---	---	-60	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V
t_{rr}	Reverse Recovery Time ³	$I_S=-10A, dI/dt=100A/\mu s$	---	39.2	---	ns
Q_{rr}	Reverse Recovery Charge ³	$T_J=25^\circ\text{C}$	---	47.6	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-50V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-60A$., Starting $T_J=25^\circ\text{C}$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

100V P-Channel MOSFETs

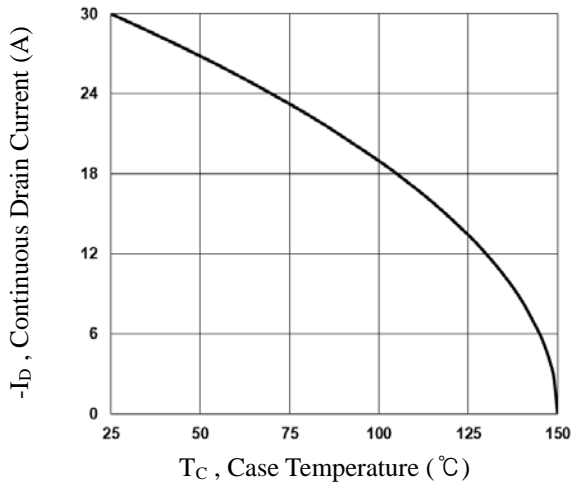


Fig.1 Continuous Drain Current vs. T_c

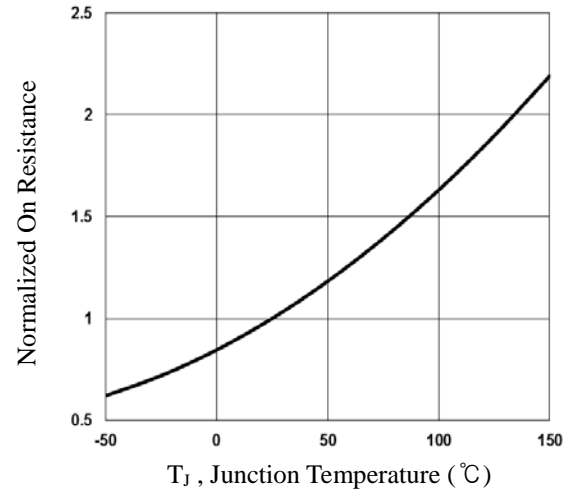


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

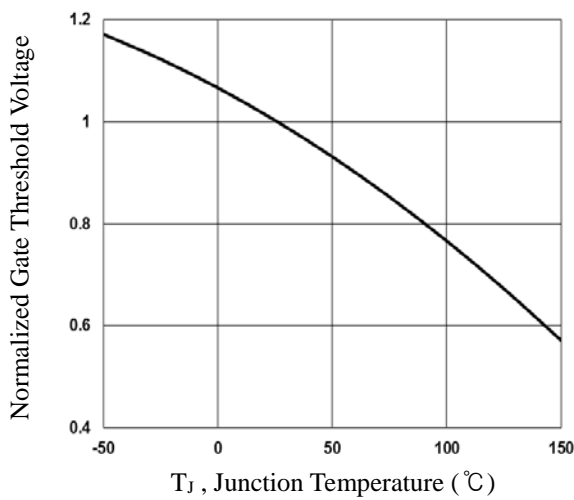


Fig.3 Normalized V_{th} vs. T_j

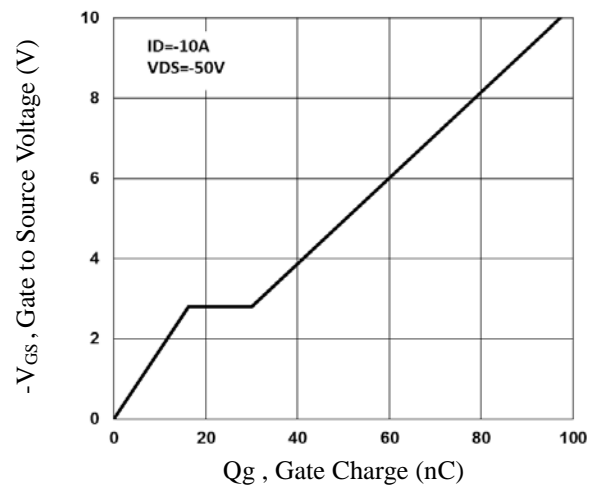


Fig.4 Gate Charge Waveform

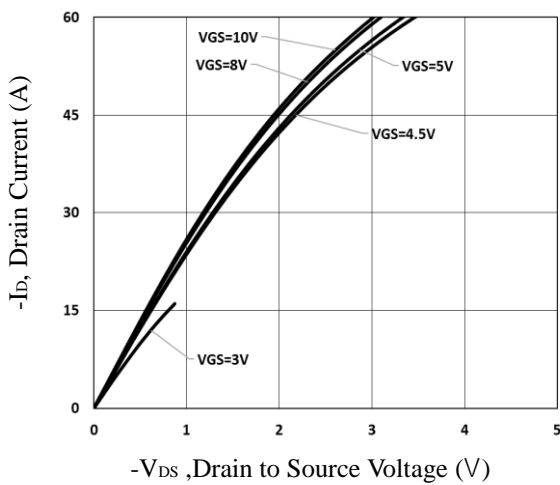


Fig.5 Typical Output Characteristics

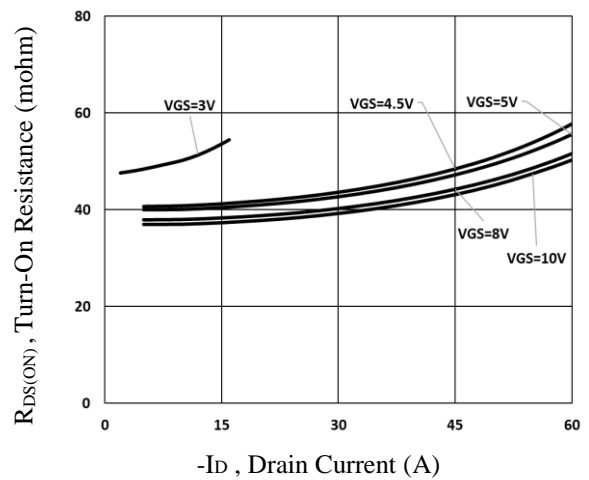


Fig.6 Turn-On Resistance vs. I_D

100V P-Channel MOSFETs

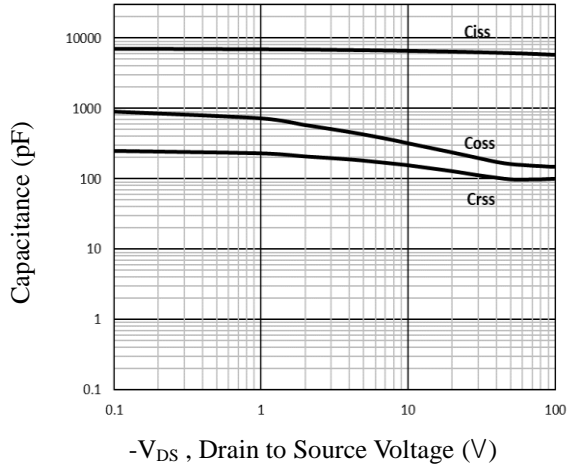


Fig.7 Capacitance Characteristics

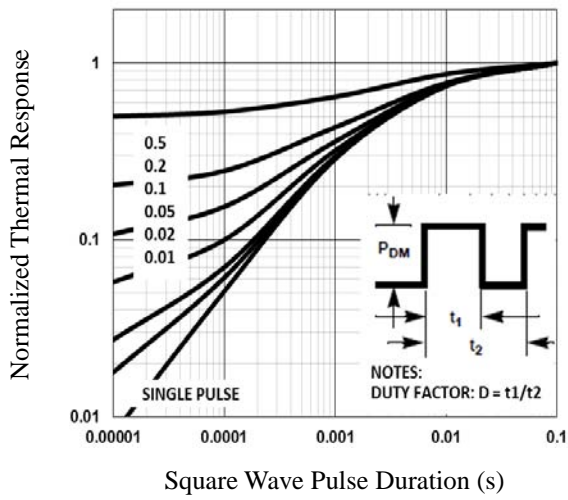


Fig.8 Normalized Transient Impedance

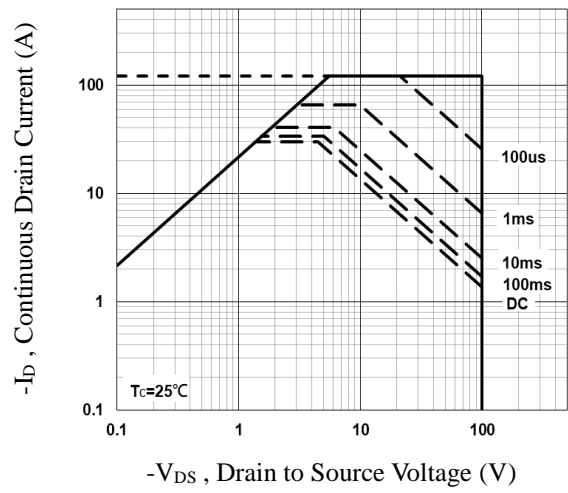


Fig.9 Maximum Safe Operation Area

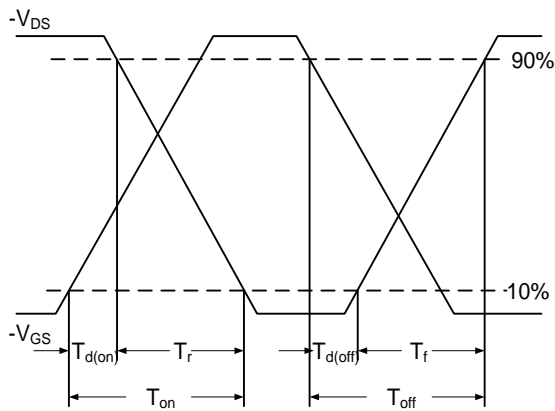


Fig.10 Switching Time Waveform

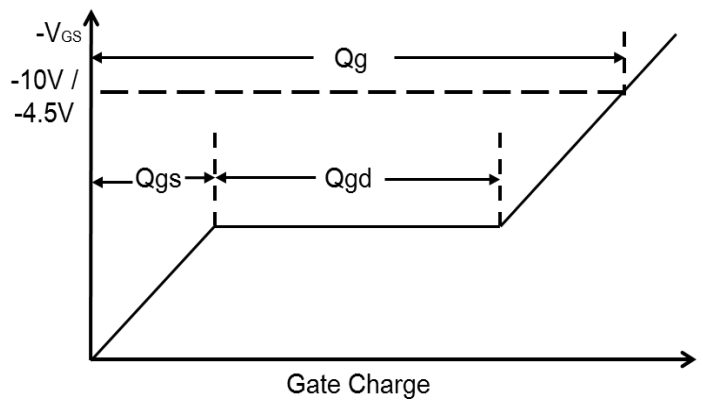
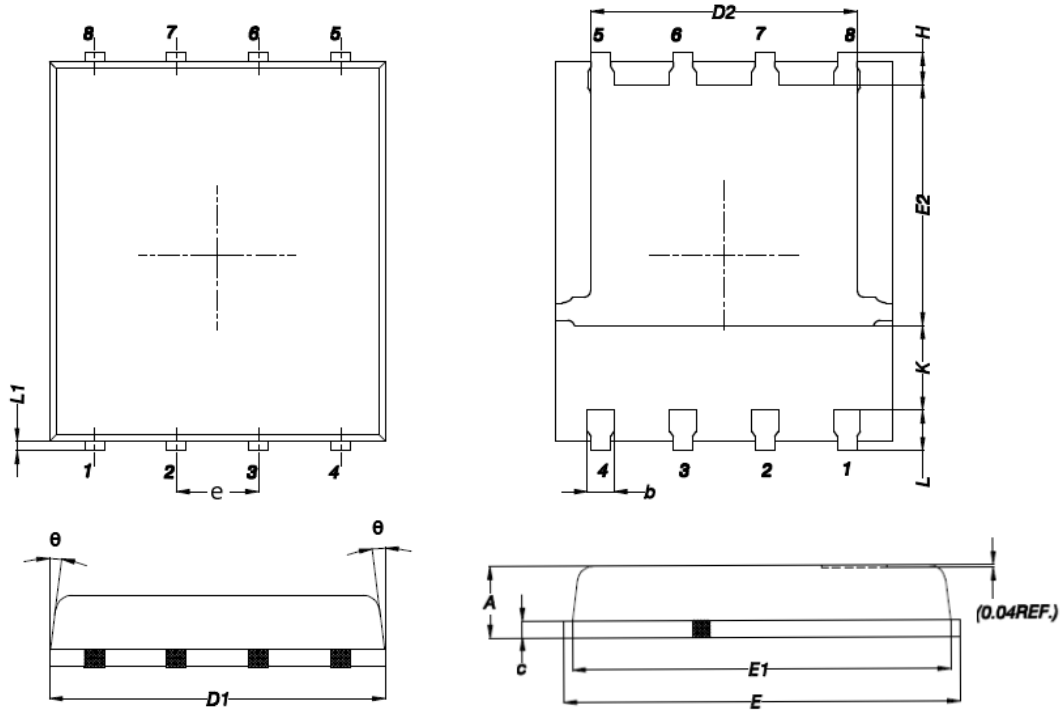


Fig.11 Gate Charge Waveform

100V P-Channel MOSFETs

PPAK5x6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°