

## 30V P-Channel MOSFETs

### General Description

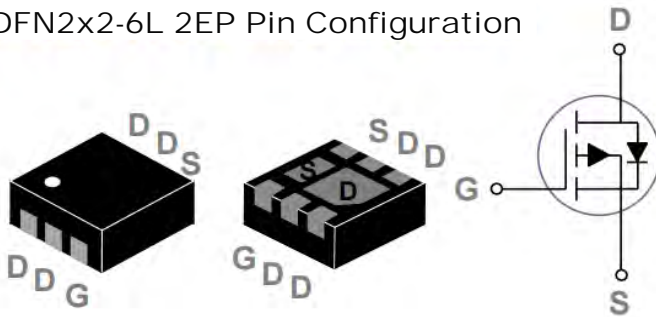
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R <sub>DS(ON)</sub>	I <sub>D</sub>
-30V	17mΩ	-30A

### Features

- -30V,-30A, R<sub>DS(ON)</sub> =17mΩ @V<sub>GS</sub> = -10V
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

### DFN2x2-6L 2EP Pin Configuration



### Applications

- MB / VGA / V<sub>core</sub>
- POL Applications
- Load Switch
- LED Application

### Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-30	V
V <sub>GS</sub>	Gate-Source Voltage	± 20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>c</sub> =25°C)	-30	A
	Drain Current – Continuous (T <sub>c</sub> =100°C)	-19	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-120	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	27	W
	Power Dissipation – Derate above 25°C	0.22	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	4.6	°C/W



# FTK3017PDFN22

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

### Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25\text{ }^\circ\text{C}$ , $I_D=-1mA$	---	-0.03	---	V/ $^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-27V, V_{GS}=0V, T_J=25\text{ }^\circ\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125\text{ }^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-8A$	---	16	18	m $\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	---	22	30	m $\Omega$
$V_{GS(th)}$	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		---	4	---	mV/ $^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=-10V, I_D=-8A$	---	6.8	---	S

### Dynamic and switching Characteristics

$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A$	---	11	17	nC
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>		---	3.4	6	
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>		---	4.2	8	
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-1A$	---	5.8	11	ns
$T_r$	Rise Time <sup>2, 3</sup>		---	18.8	36	
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>		---	46.9	90	
$T_f$	Fall Time <sup>2, 3</sup>		---	12.3	23	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1MHz$	---	1250	2500	pF
$C_{oss}$	Output Capacitance		---	160	320	
$C_{riss}$	Reverse Transfer Capacitance		---	90	180	

### 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	$V_{GS}=0V, I_S=-1A, T_J=25\text{ }^\circ\text{C}$	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

## Typical Performance Characteristics

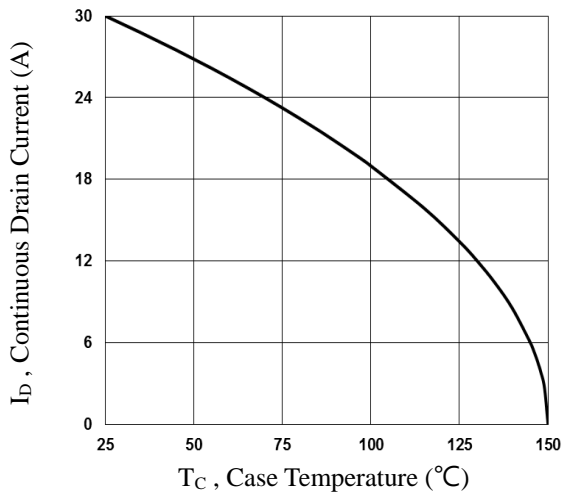


Fig.1 Continuous Drain Current vs.  $T_c$

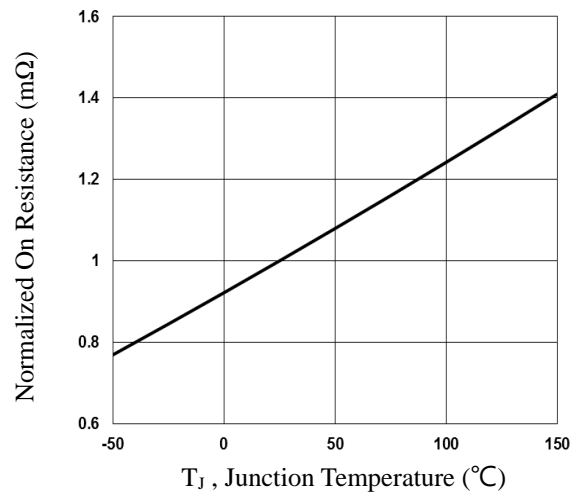


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$

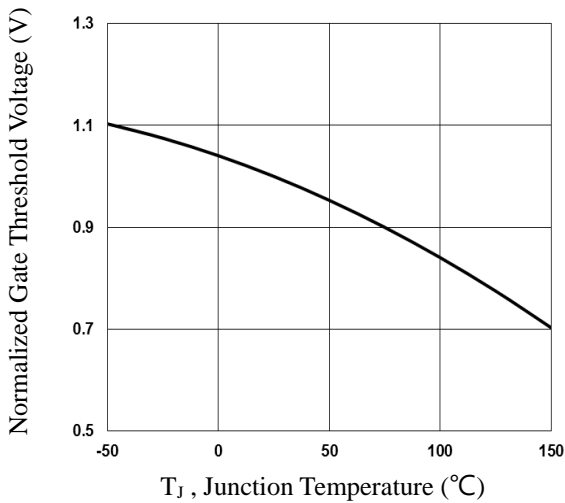


Fig.3 Normalized  $V_{th}$  vs.  $T_j$

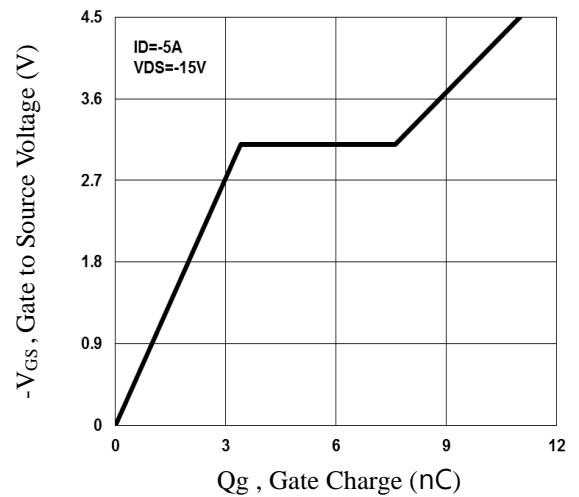


Fig.4 Gate Charge Waveform

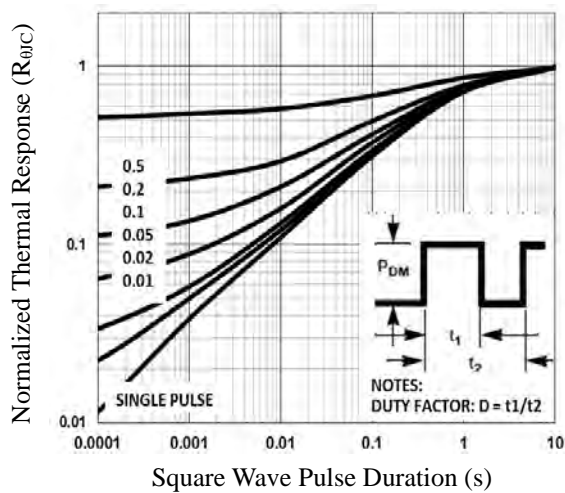


Fig.5 Normalized Transient Impedance

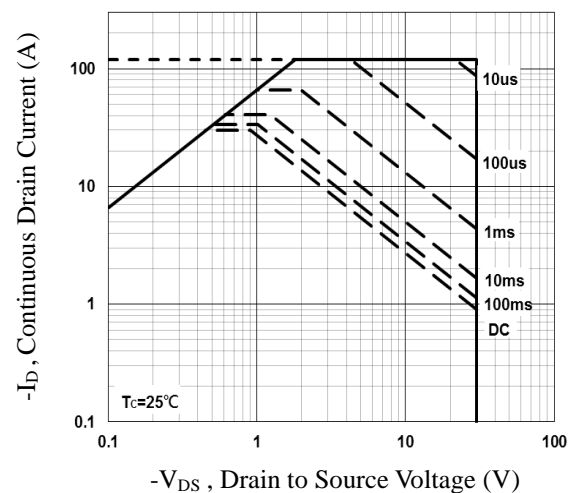


Fig.6 Maximum Safe Operation Area

## Typical Performance Characteristics(Con.)

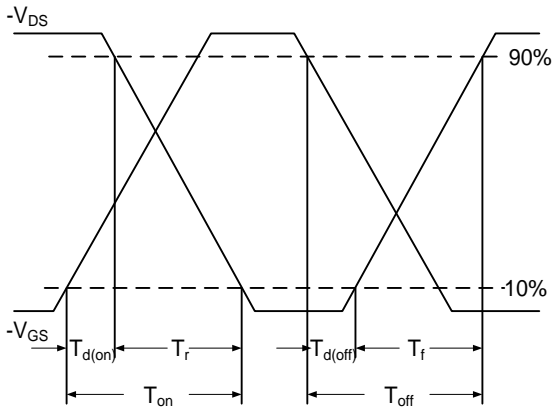


Fig.7 Switching Time Waveform

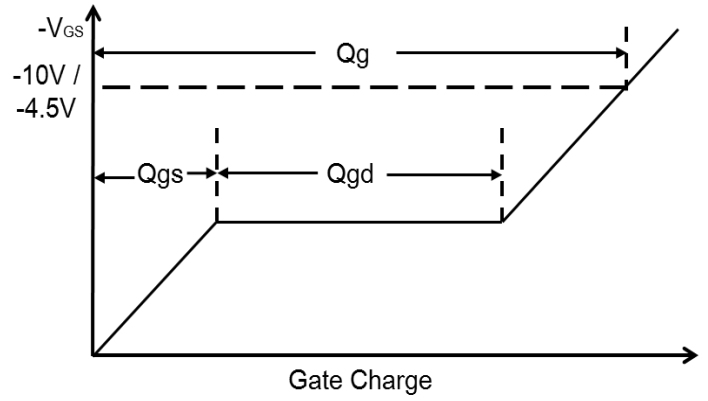
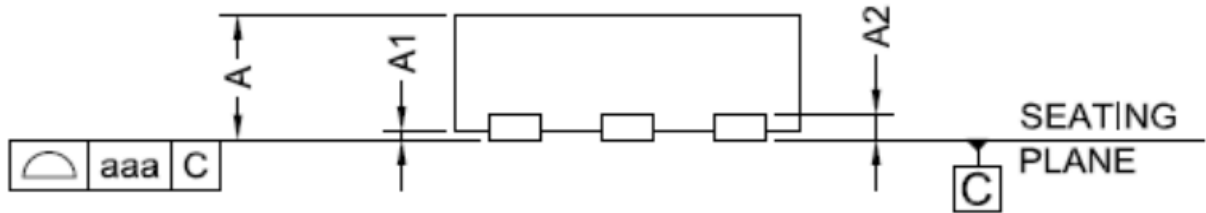
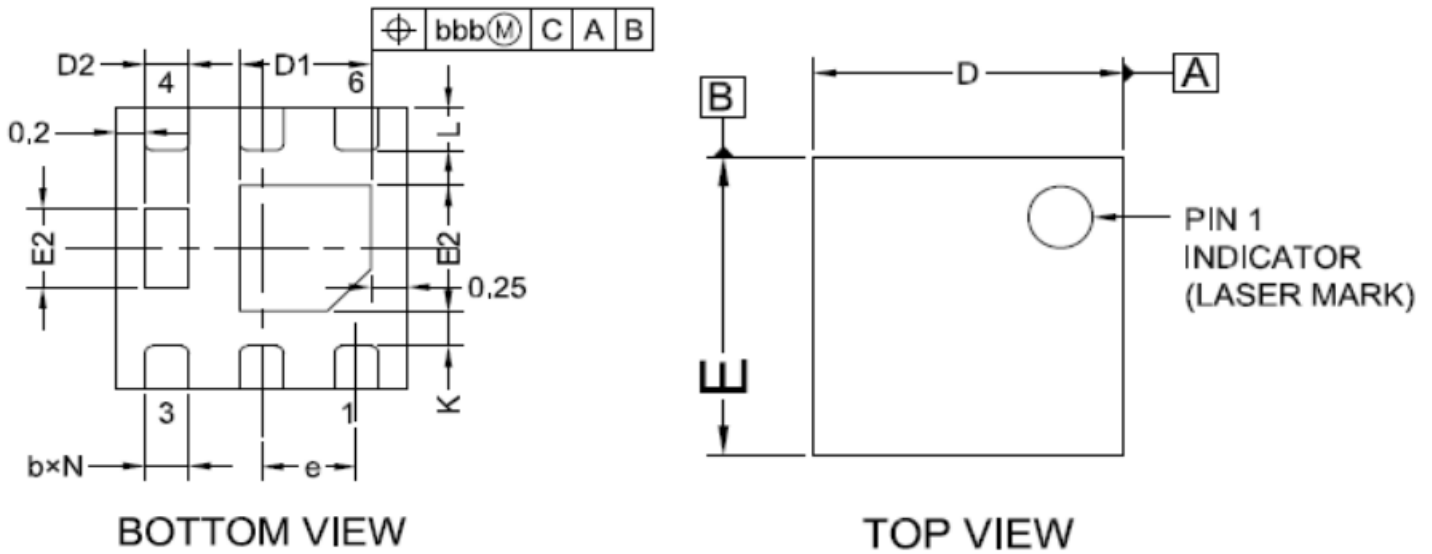


Fig.8 Gate Charge Waveform

## DFN2x2 PACKAGE INFORMATION



SYMBOL	MIN	TYP	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2	0.152REF.		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e	0.65BSC		
L	0.25	0.30	0.35
J	0.40BSC		
K	0.20MIN		
N	6		
aaa	0.08		
bbb	0.10		