

General Description

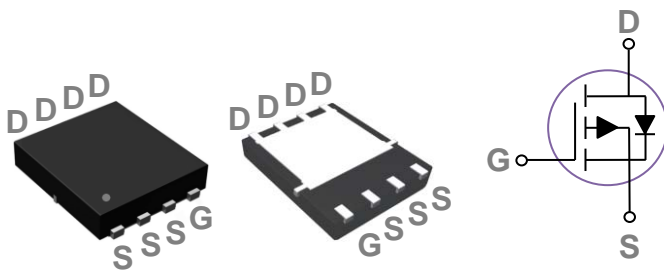
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R _{DS(ON)}	ID
-60V	24mΩ	-40A

Features

- -60V,-40A, R_{DS(ON)} 24mΩ @V_{GS} = -10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications

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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _C =25 °C)	-40	A
	Drain Current – Continuous (T _C =100 °C)	-26	A
I _{DM}	Drain Current – Pulsed ¹	-160	A
EAS	Single Pulse Avalanche Energy ²	105	mJ
IAS	Single Pulse Avalanche Current ²	-46	A
P _D	Power Dissipation (T _C =25 °C)	96	W
	Power Dissipation – Derate above 25 °C	0.77	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 _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	1.3	°C/W



FTK6903DFN56

Electrical Characteristics(T_J=25°C,unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-60	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-60V , V _{GS} =0V , T _J =25°C	---	---	-1	uA
		V _{DS} =-48V , V _{GS} =0V , T _J =125°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V , I _D =-15A	---	20	24	mΩ
		V _{GS} =-4.5V , I _D =-10A	---	26	34	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V , I _S =-5A	---	15	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2,3}	V _{DS} =-30V , V _{GS} =-10V , I _D =-20A	---	43.8	66	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	4.6	7	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	8.3	13	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =-30V , V _{GS} =-10V , R _G =6Ω I _D =-20A	---	25	38	ns
T _r	Rise Time ^{2,3}		---	13.8	21	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	148	222	
T _f	Fall Time ^{2,3}		---	51	77	
C _{iss}	Input Capacitance	V _{DS} =-30V , V _{GS} =0V , F=1MHz	---	2595	3893	pF
C _{oss}	Output Capacitance		---	162	243	
C _{rss}	Reverse Transfer Capacitance		---	115	173	
R _g	Gate resistance	V _{GS} =0V , V _{DS} =0V , F=1MHz	---	8	---	Ω

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	---	---	-40	A
I _{SM}	Pulsed Source Current		---	---	-80	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1	V
t _{rr}	Reverse Recovery Time	V _R =-50V , I _S =-10A	---	40	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs , T _J =25°C	---	30	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-46A., Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

60V P-Channel MOSFETs

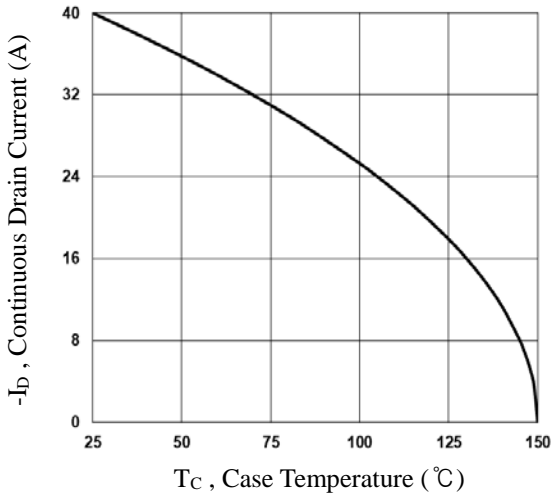


Fig.1 Continuous Drain Current vs. T_C

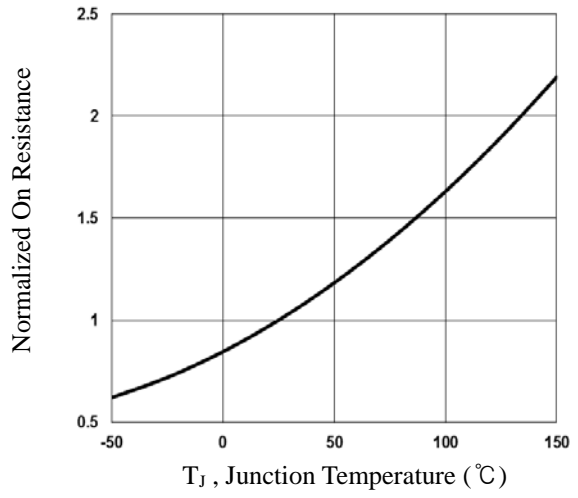


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

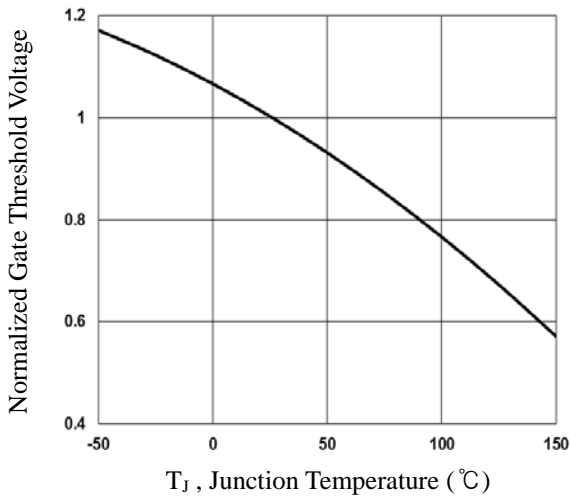


Fig.3 Normalized V_{th} vs. T_J

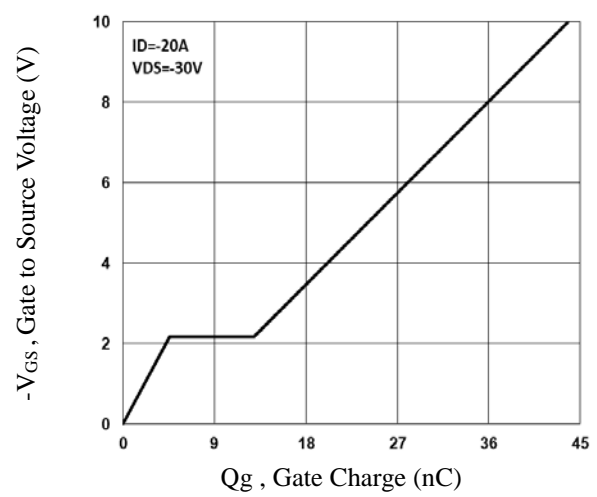


Fig.4 Gate Charge Characteristics

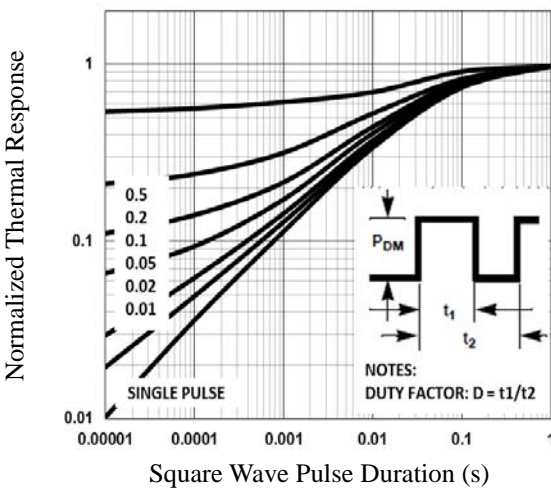


Fig.5 Normalized Transient Impedance

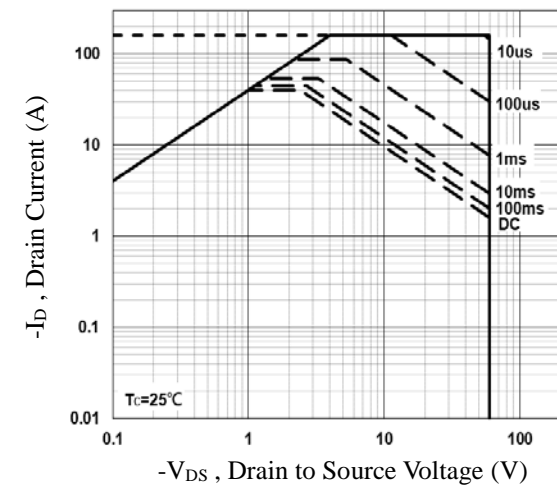


Fig.6 Maximum Safe Operation Area

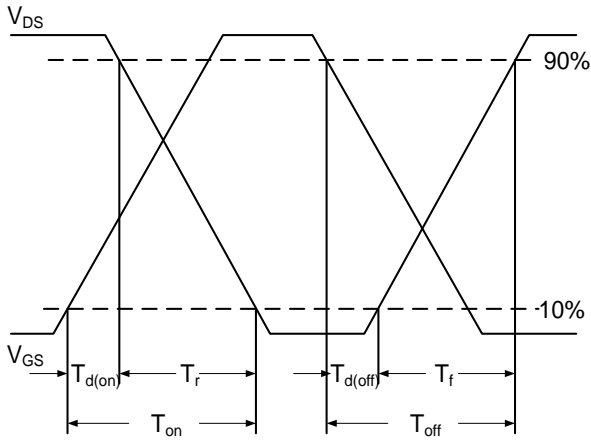


Fig.7 Switching Time Waveform

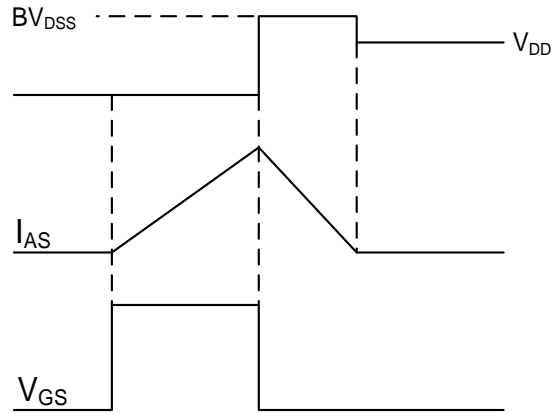
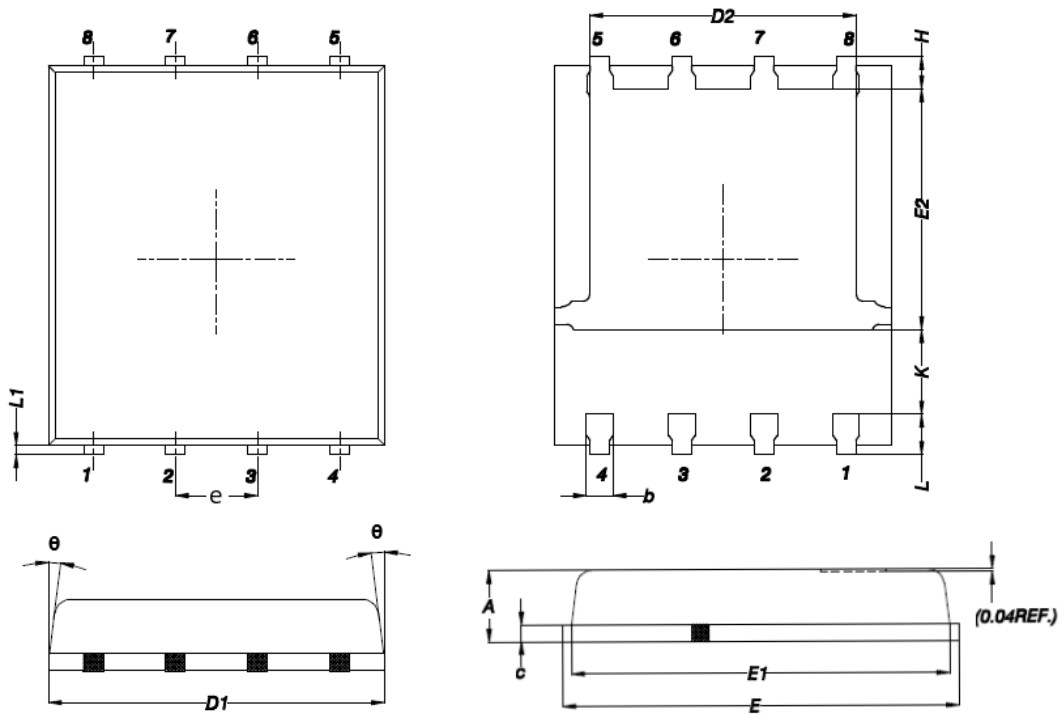


Fig.8 EAS Waveform

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°