SEMICONDUCTOR
TECHNICAL DATA

FTK6907D

60V P-Channel MOSFETs

BVDSS	RDSON	ID
-60V	68mΩ	-13A

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.

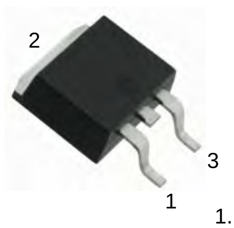
Features

- *-60V,-13A, RDS(ON) =68mΩ@VGS = -10V*
- *Fast switching*
- *Green Device Available*
- *Suit for -4.5V Gate Drive Applications*

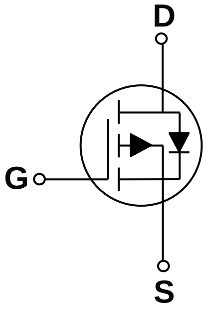
Applications

- *POL Applications*
- *Load Switch*
- *LED Application*

TO-252 Pin Configuration



1. Gate
2. Drain
3. Source



Absolute Maximum Ratings **(Tc=25℃ unless otherwise noted)**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 25	V
I_D	Drain Current – Continuous (T_C=25℃)	-13	A
	Drain Current – Continuous (T_C=100℃)	-8	A
I_{DM}	Drain Current – Pulsed[1]	-52	A
EAS	Single Pulse Avalanche Energy[2]	31	mJ
IAS	Single Pulse Avalanche Current[2]	-25	A
P_D	Power Dissipation (T_C=25℃)	20	W
	Power Dissipation – Derate above 25℃	0.16	W/℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	6.1	℃/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	℃/W

Electrical Characteristics **(T_J=25℃, 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
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.05	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-48V , V_{GS}=0V , T_J=125℃	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=± 25V , V_{DS}=0V	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-6A	---	54	68	mΩ
		V_{GS}=-4.5V , I_D=-3A	---	72	85	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=-250uA	-1.2	-1.6	-2.2	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	5	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_D=-6A	---	8.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=-30V , V_{GS}=-10V , I_D=-6A	---	16.4	23	nC
Q_{gs}	Gate-Source Charge[3,4]		---	2.8	4	
Q_{gd}	Gate-Drain Charge[3,4]		---	3.6	6	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=-30V , V_{GS}=-10V , R_G=6Ω I_D=-1A	---	8.3	16	ns
T_r	Rise Time[3,4]		---	29.6	56	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	51.7	98	
T_f	Fall Time[3,4]		---	15.6	30	
C_{iss}	Input Capacitance	V_{DS}=-30V , V_{GS}=0V , F=1MHz	---	870	1260	pF
C_{oss}	Output Capacitance		---	70	100	
C_{rss}	Reverse Transfer Capacitance		---	42	60	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	16	32	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	---	---	-13	A
I_{SM}	Pulsed Source Current		---	---	-52	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V
t_{rr}	Reverse Recovery Time[3]	V_{GS}=0V,I_S=-1A , dI/dt=100A/μs T_J=25℃	---	---	---	ns
Q_{rr}	Reverse Recovery Charge[3]		---	---	---	nC

Note :

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

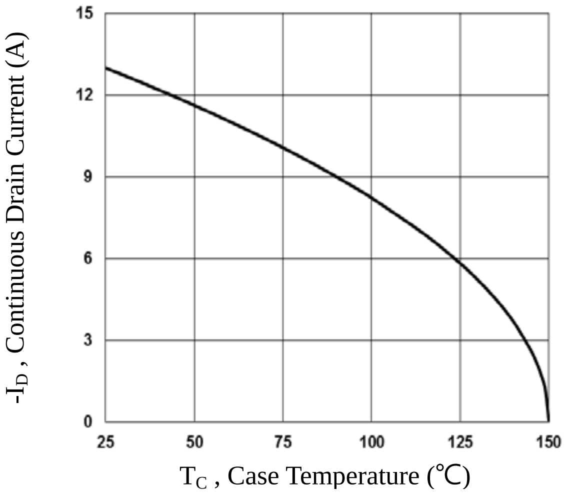


Fig.1 Continuous Drain Current vs. T_C

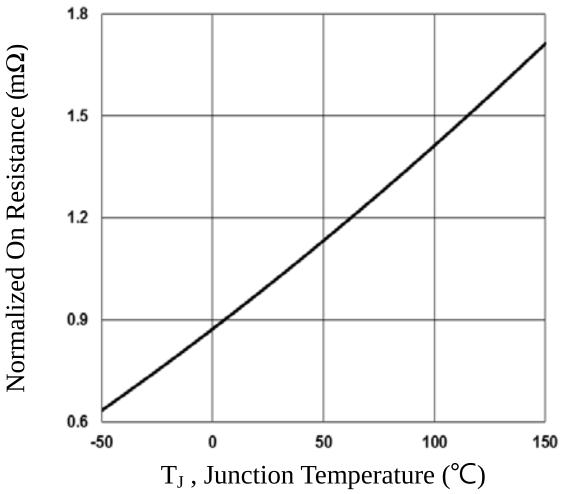


Fig.2 Normalized RDSON vs. T_J

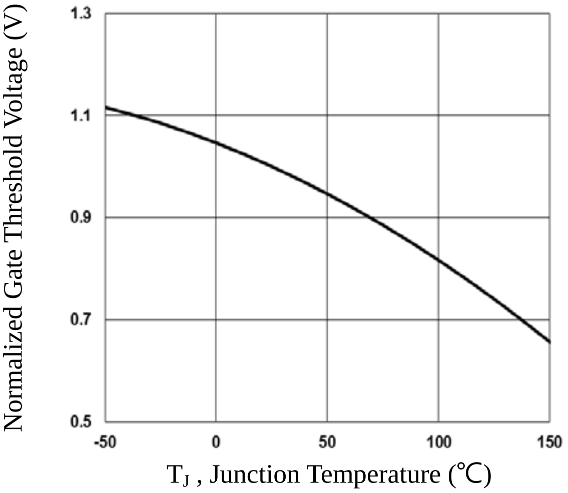


Fig.3 Normalized V_{th} vs. T_J

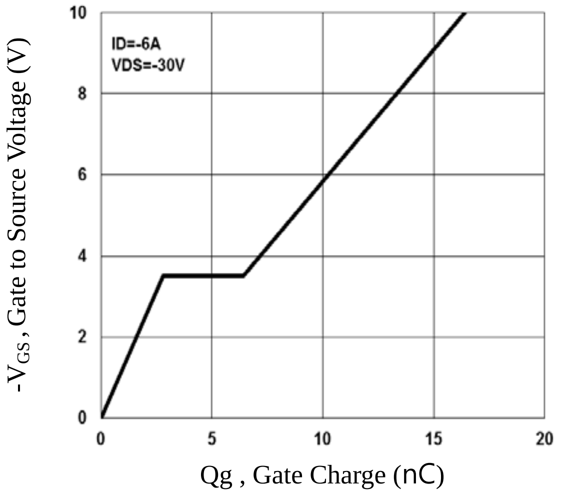


Fig.4 Gate Charge Waveform

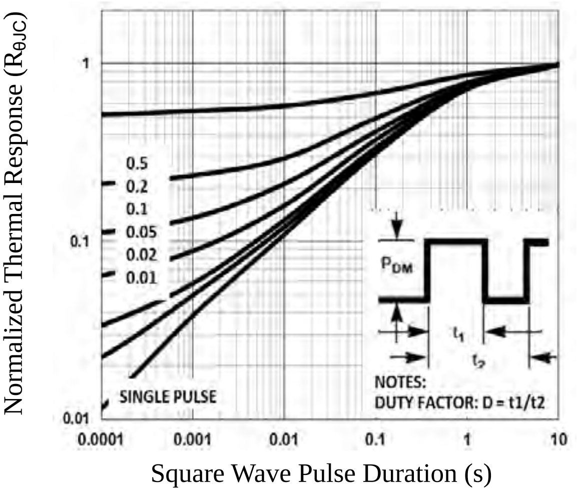


Fig.5 Normalized Transient Impedance

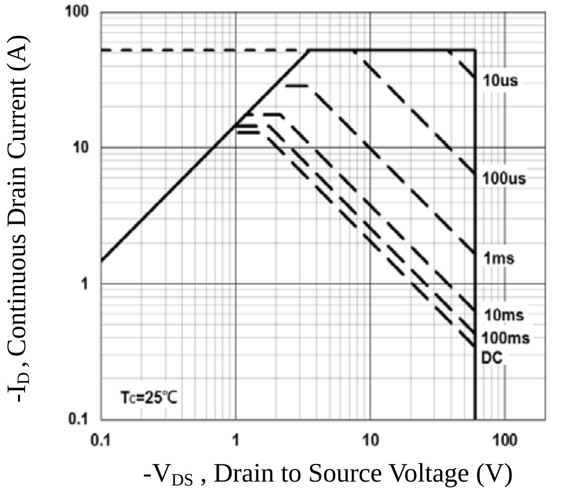


Fig.6 Maximum Safe Operation Area

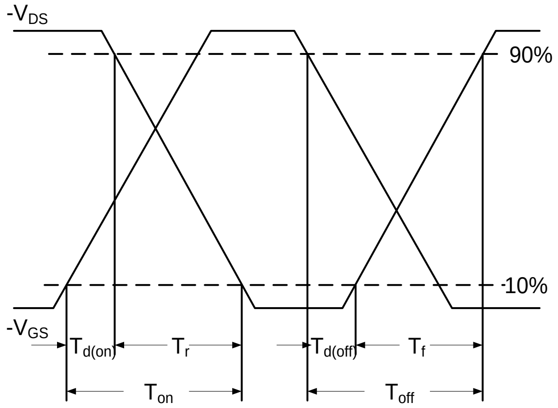


Fig.7 Switching Time Waveform

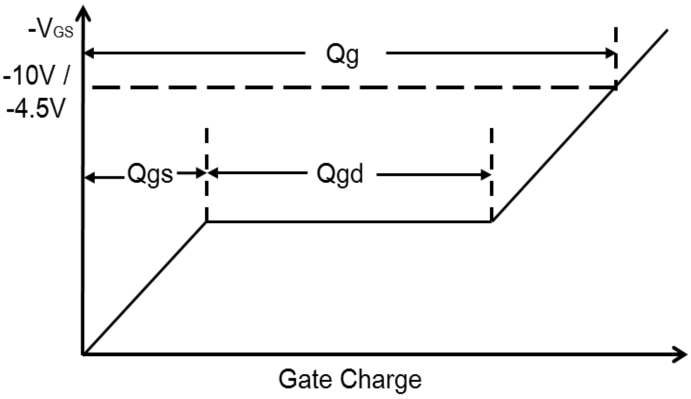
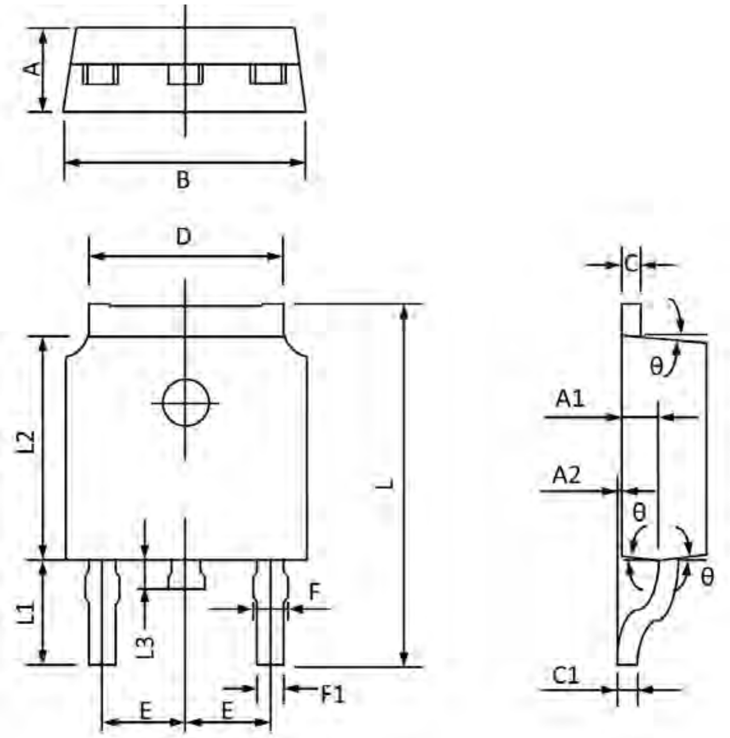


Fig.8 Gate Charge Waveform

TO-252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	1.140	0.600	0.045	0.024
F1	0.880	0.500	0.035	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.223	5.400	0.245	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°