FTK2612D

20V N-Channel MOSFETs

General Description

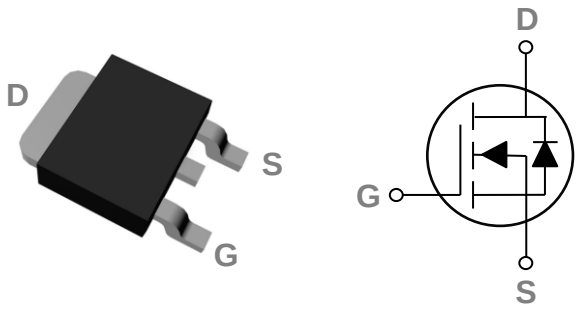
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	RDSON	ID
20V	17mΩ	30A

Features

- *20V,30A, RDS(ON) =17mΩ@VGS = 4.5V*
- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Green Device Available*

TO252 Pin Configuration



Applications

- *POL Applications*
- *SMPS 2nd SR*

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous (T_C=25℃)	30	A
	Drain Current – Continuous (T_C=100℃)	19	A
I_{DM}	Drain Current – Pulsed[1]	120	A
P_D	Power Dissipation (T_C=25℃)	24.9	W
	Power Dissipation – Derate above 25℃	0.20	W/℃
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	5.02	℃/W

20V N-Channel MOSFETs

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	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=16V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=10A	---	14	17	mΩ
		V_{GS}=2.5V , I_D=5A	---	18.5	24	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250μA	0.5	0.8	1.2	V

Dynamic and switching Characteristics[2]

Q_g	Total Gate Charge	V_{DS}=10V , V_{GS}=4.5V , I_D=5A	---	5.9	12	nC
Q_{gs}	Gate-Source Charge		---	0.7	2	
Q_{gd}	Gate-Drain Charge		---	1.8	4	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=4.5V , R_G=3.3Ω I_D=1A	---	4.8	10	ns
T_r	Rise Time		---	7.5	15	
$T_{d(off)}$	Turn-Off Delay Time		---	16.5	32	
T_f	Fall Time		---	4.8	10	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , F=1MHz	---	775	1440	pF
C_{oss}	Output Capacitance		---	95	190	
C_{rss}	Reverse Transfer Capacitance		---	58	120	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.2	---	Ω

Drain-Source Diode Characteristics

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[2]		---	---	60	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Essentially independent of operating temperature.

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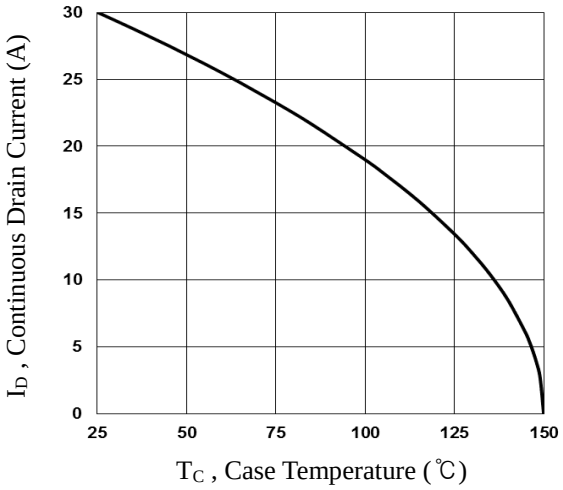

Fig.1 Continuous Drain Current vs. T_C

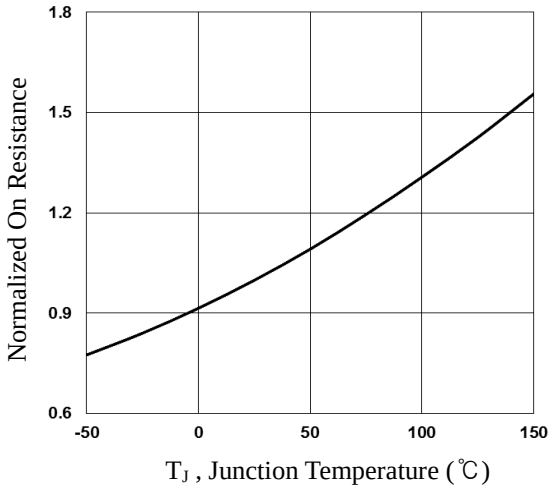

Fig.2 Normalized RDSON vs. T_J

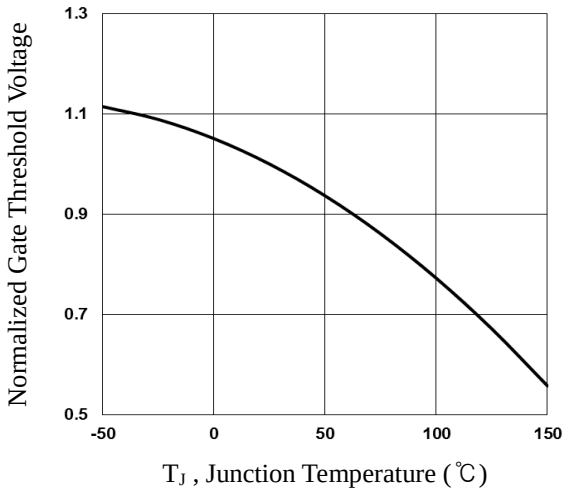

Fig. 3 Normalized V_{th} vs. T_J

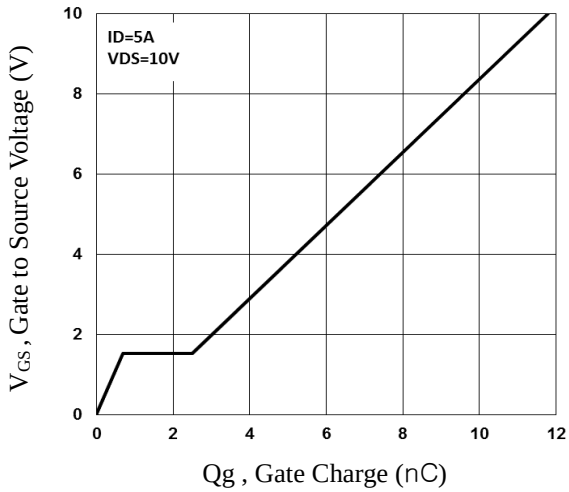

Fig. 4 Gate Charge Waveform

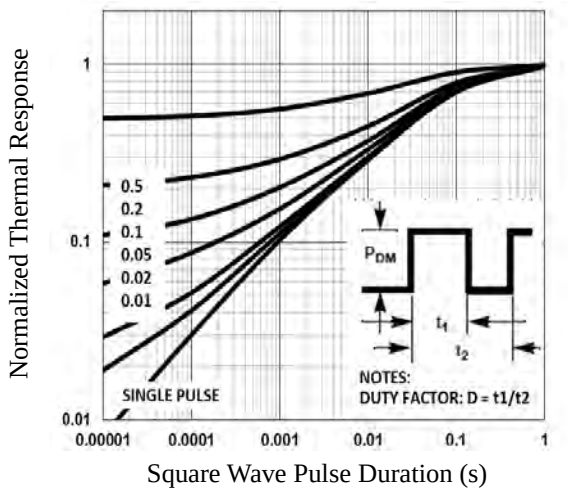

Fig. 5 Normalized Transient Impedance

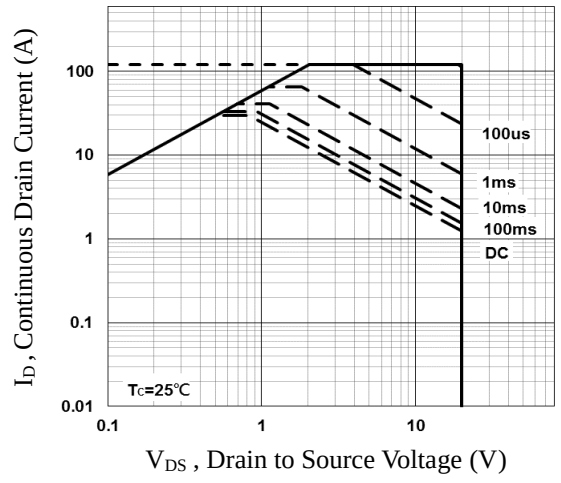

Fig. 6 Maximum Safe Operation Area

20V N-Channel MOSFETs

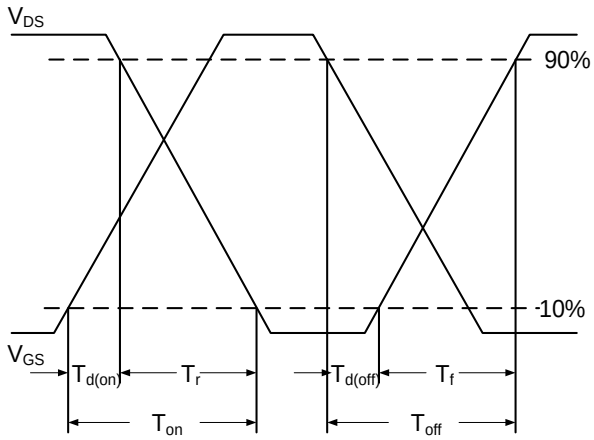

Fig. 7 Switching Time Waveform

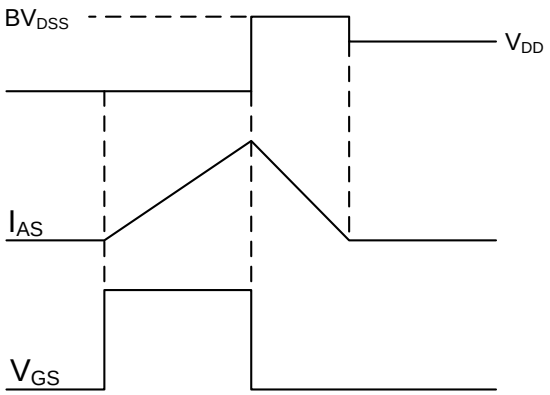

Fig. 8 EAS Waveform

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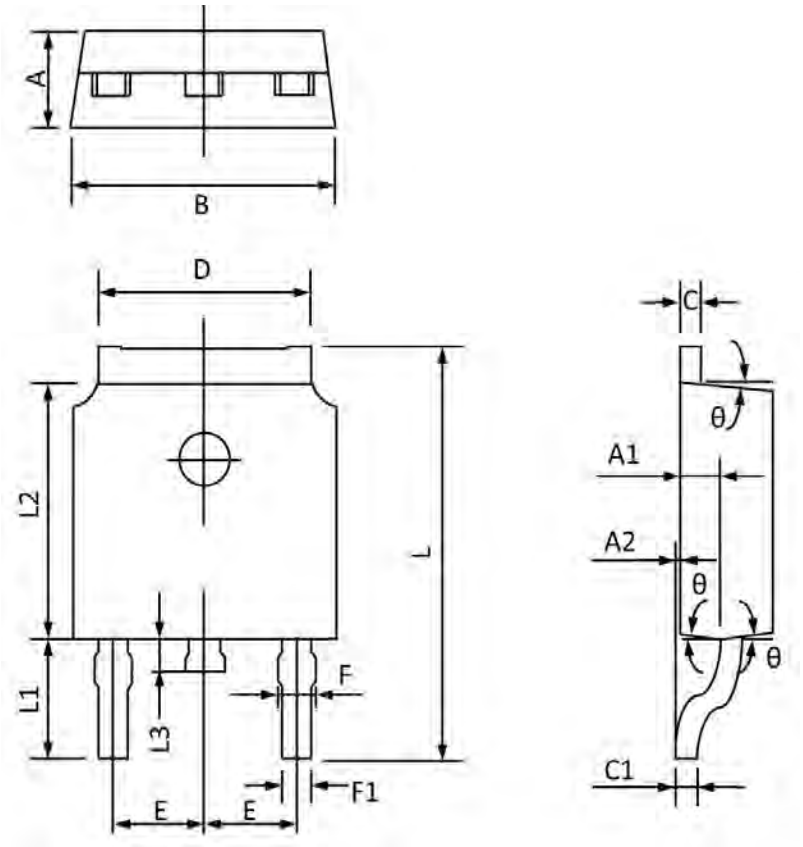
TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.900	0.047	0.035
A2	0.250	0.000	0.010	0.000
B	6.800	6.300	0.268	0.248
C	0.600	0.350	0.024	0.014
C1	0.600	0.380	0.024	0.015
D	5.500	5.100	0.217	0.201
E	2.400	2.000	0.094	0.079
F	1.150	0.600	0.045	0.024
F1	0.900	0.500	0.035	0.020
L	10.400	9.400	0.409	0.370
L1	3.100	2.400	0.122	0.094
L2	6.300	5.300	0.248	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°