

30V Dual N-Channel MOSFETs

General Description

These dual N Channel enhancement mode power field effect transistors are using trench DMOS technology.

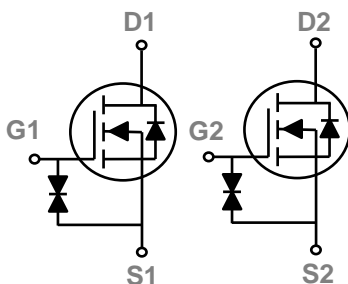
This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	RDSON	ID
30V	450mΩ	800mA

Features

- Fast switching
- Green Device Available
- Suit for 1.5V Gate Drive Applications

SOT-363 Dual Pin Configuration



Applications

- Notebook
- Load Switch
- Networking
- Hand-held Instruments

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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Drain Current – Continuous (T _A =25°C)	800	mA
	Drain Current – Continuous (T _A =70°C)	640	mA
I _{DM}	Drain Current – Pulsed ¹	3.2	A
P _D	Power Dissipation (T _A =25°C)	275	mW
	Power Dissipation – Derate above 25°C	2.2	mW/°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	---	450	°C/W



FTK3520NN

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 $25\text{ }^\circ\text{C}$, $I_D=1mA$	---	-0.01	---	V/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V, T_J=25\text{ }^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=125\text{ }^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=0.3A$	---	370	450	m Ω
		$V_{GS}=2.5V, I_D=0.2A$	---	510	650	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.7	1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-1.74	---	mV/ $^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=4V, I_D=0.3A$	---	0.8	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=15V, V_{GS}=4.5V, I_D=0.3A$	---	2.6	5.2	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.9	1.8	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	0.6	1.2	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=15V, V_{GS}=4.5V, R_G=10\Omega$ $I_D=0.3A$	---	5.5	11	ns
T_r	Rise Time ^{2, 3}		---	4	8	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	14.5	29	
T_f	Fall Time ^{2, 3}		---	6.5	13	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1MHz$	---	72.9	146	pF
C_{oss}	Output Capacitance		---	18.3	36.6	
C_{rss}	Reverse Transfer Capacitance		---	7.4	14.8	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_{GS}=V_D=0V$, Force Current	---	---	0.8	A
I_{SM}	Pulsed Source Current		---	---	1.6	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=0.3A, T_J=25\text{ }^\circ\text{C}$	---	---	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

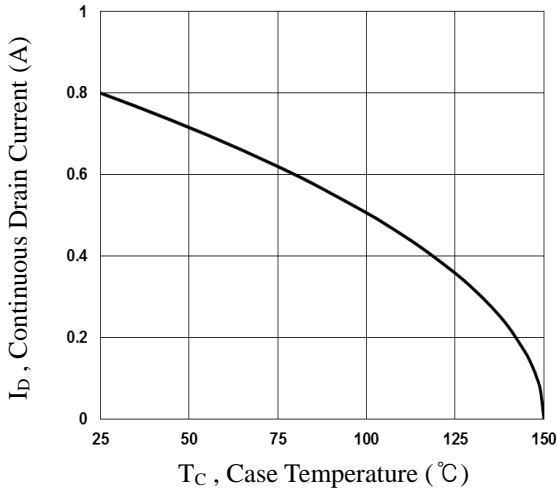


Fig.1 Continuous Drain Current vs. T_C

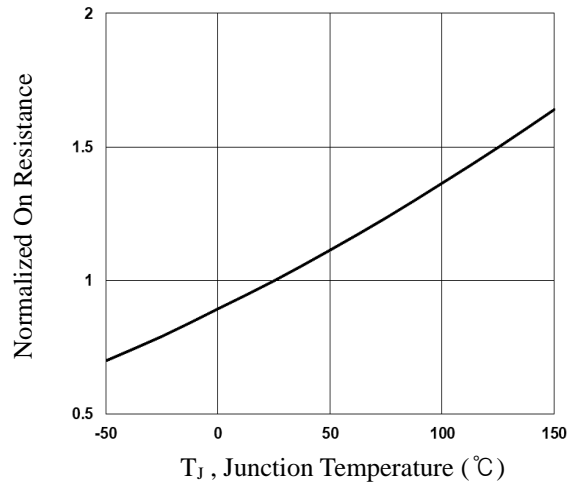


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

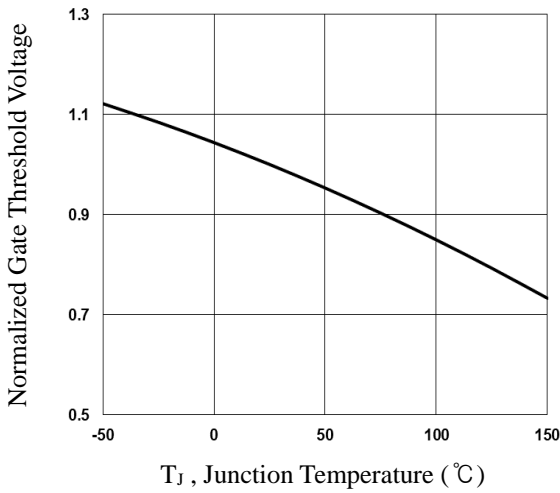


Fig.3 Normalized V_{th} vs. T_J

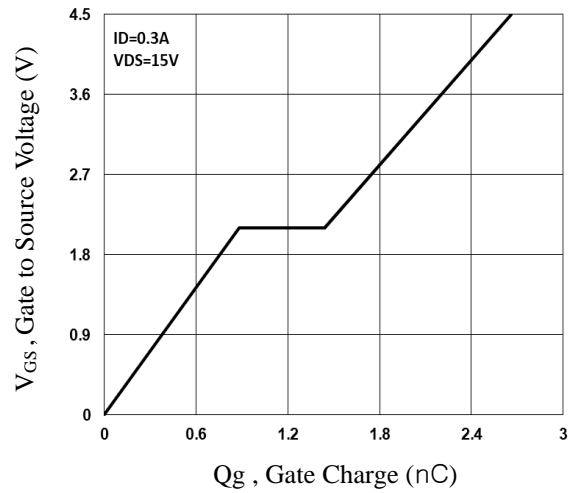


Fig.4 Gate Charge Waveform

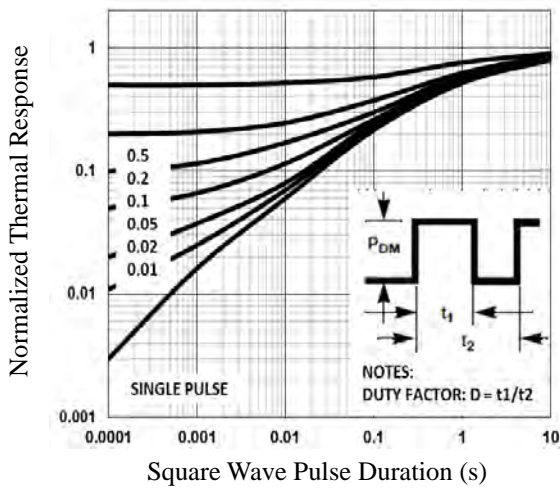


Fig.5 Normalized Transient Impedance

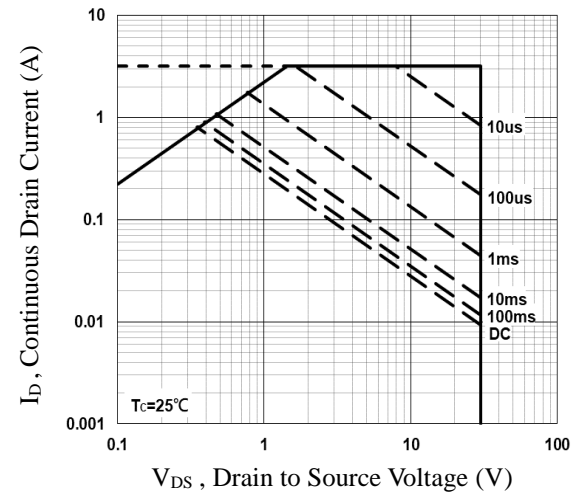


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics(Con.)

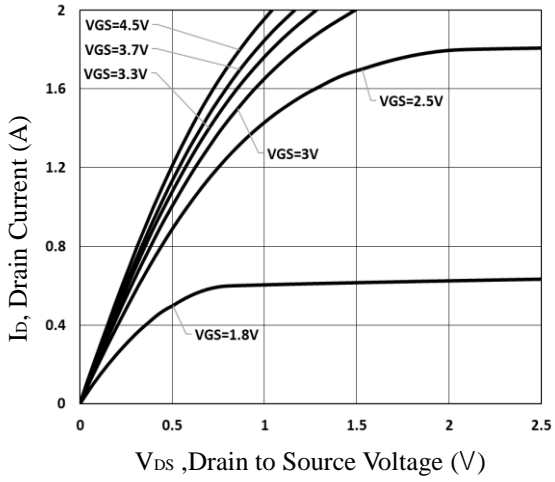


Fig.7 Typical Output Characteristics

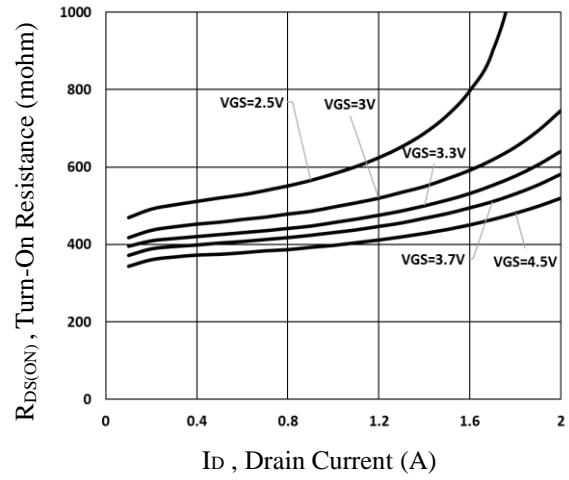
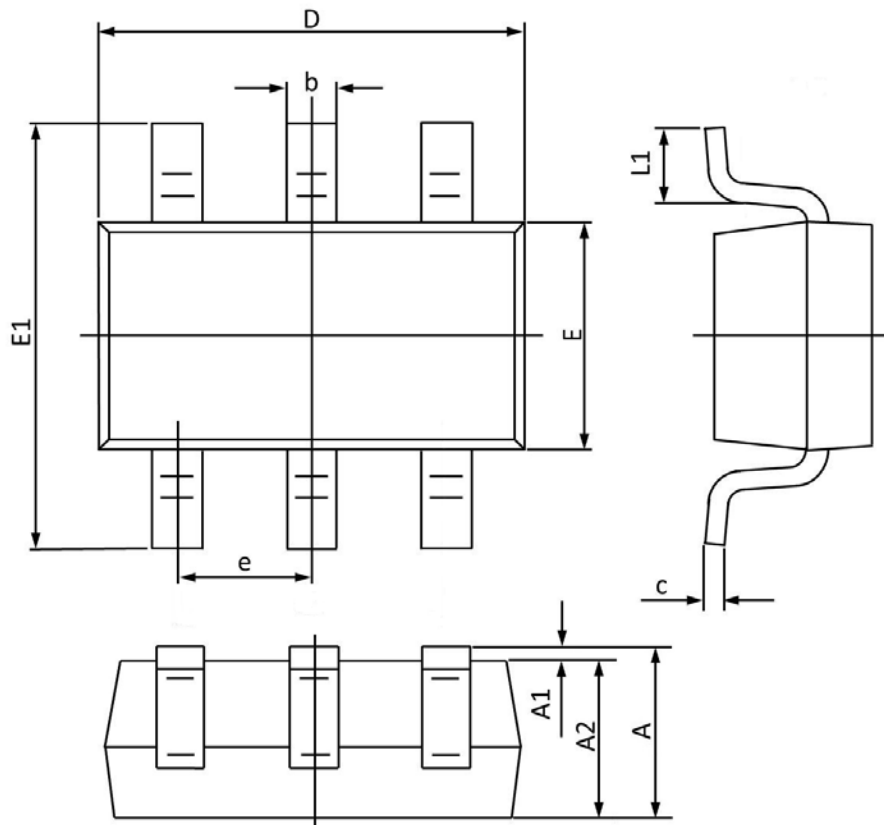


Fig.8 Turn - On Resistance vs. I_D

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SOT-363 Dual PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004