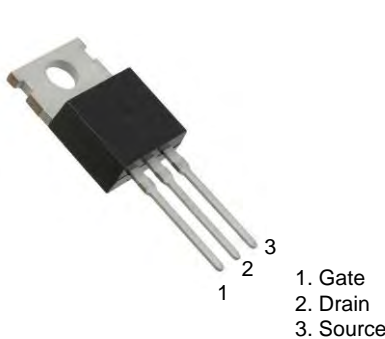


100V N-Channel MOSFETs

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.

TO-220 Pin Configuration



BVDSS	RDSON	ID
100V	18mΩ	60A

Features

- 100V,60A, $R_{DS(ON)} = 18m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	60	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	38	A
I_{DM}	Drain Current – Pulsed ¹	240	A
EAS	Single Pulse Avalanche Energy ²	45	mJ
IAS	Single Pulse Avalanche Current ²	30	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	113	W
	Power Dissipation – Derate above 25°C	0.90	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1.1	$^\circ\text{C}/\text{W}$



FTK0966P

100V N-Channel MOSFETs

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	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to $25\text{ }^\circ\text{C}$, $I_D=1mA$	---	0.08	---	V/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_J=25\text{ }^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125\text{ }^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=25A$	---	15	18	m Ω
		$V_{GS}=6V, I_D=15A$	---	17	22	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	2	3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.3	---	mV/ $^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=3A$	---	10	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{3, 4}	$V_{DS}=50V, V_{GS}=10V, I_D=10A$	---	32.5	65	nC
Q_{gs}	Gate-Source Charge ^{3, 4}		---	6	12	
Q_{gd}	Gate-Drain Charge ^{3, 4}		---	11.1	22	
$T_{d(on)}$	Turn-On Delay Time ^{3, 4}	$V_{DD}=50V, V_{GS}=10V, R_G=6\Omega$ $I_D=1A$	---	20	40	ns
T_r	Rise Time ^{3, 4}		---	15	30	
$T_{d(off)}$	Turn-Off Delay Time ^{3, 4}		---	45	80	
T_f	Fall Time ^{3, 4}		---	21	40	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1MHz$	---	1820	3300	pF
C_{oss}	Output Capacitance		---	170	340	
C_{rss}	Reverse Transfer Capacitance		---	90	180	
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	---	1.35	2.6	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	---	---	60	A
I_{SM}	Pulsed Source Current		---	---	120	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25\text{ }^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time ³	$I_S=10A, di/dt=100A/\mu s$ $T_J=25\text{ }^\circ\text{C}$	---	38.5	---	ns
Q_{rr}	Reverse Recovery Charge ³		---	43	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=30A, R_G=25\Omega$, Starting $T_J=25\text{ }^\circ\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

100V N-Channel MOSFETs

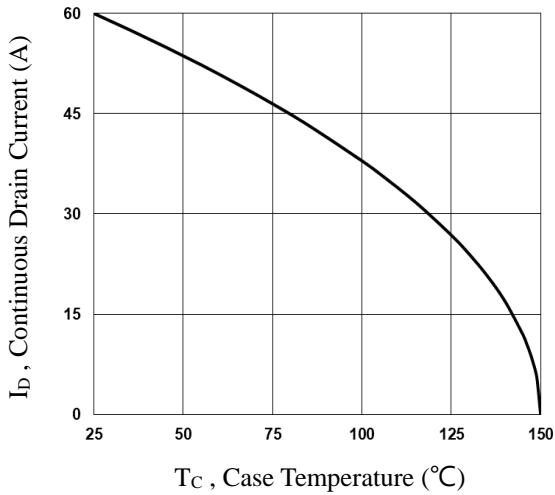


Fig.1 Continuous Drain Current vs. T_c

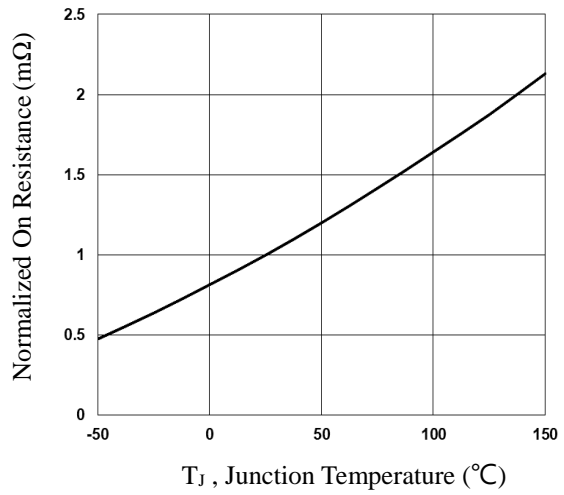


Fig.2 Normalized RD_{SON} vs. T_j

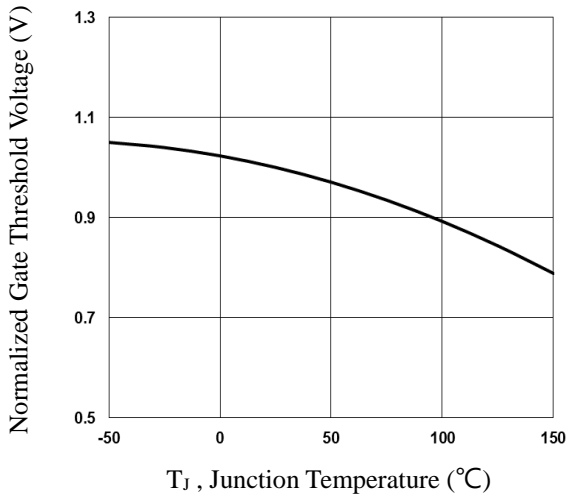


Fig.3 Normalized V_{th} vs. T_j

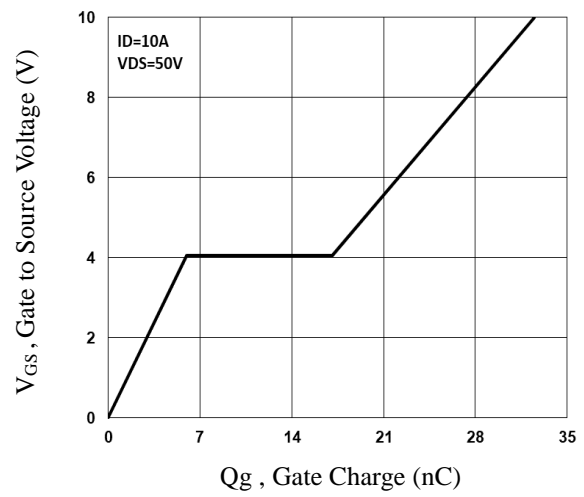


Fig.4 Gate Charge Characteristics

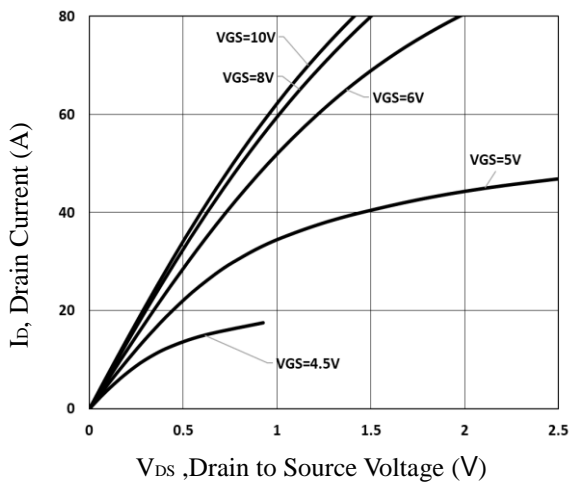


Fig.5 Typical Output Characteristics

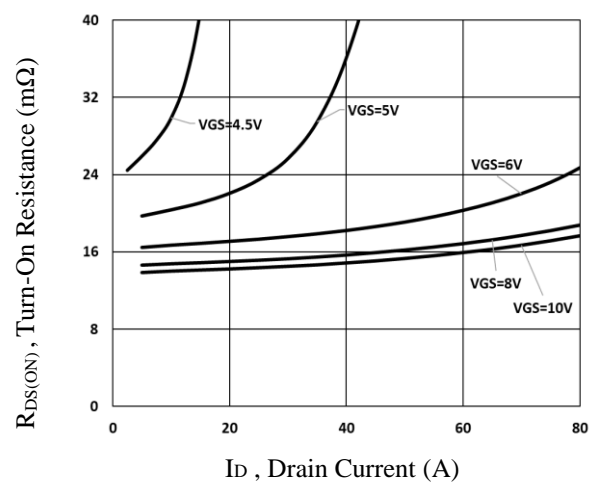


Fig.6 Turn-On Resistance vs. I_D

100V N-Channel MOSFETs

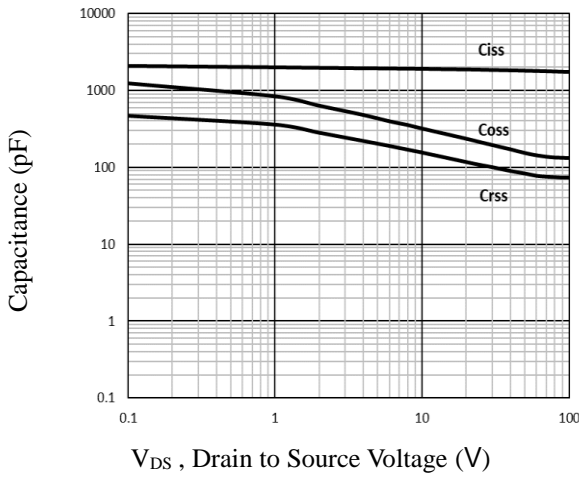


Fig.7 Capacitance Characteristics

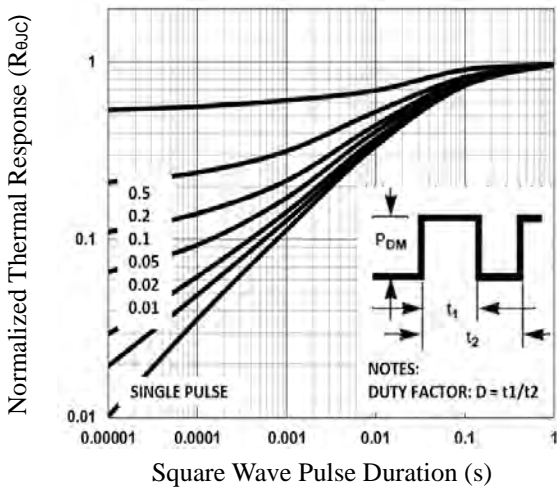


Fig.8 Normalized Transient Impedance

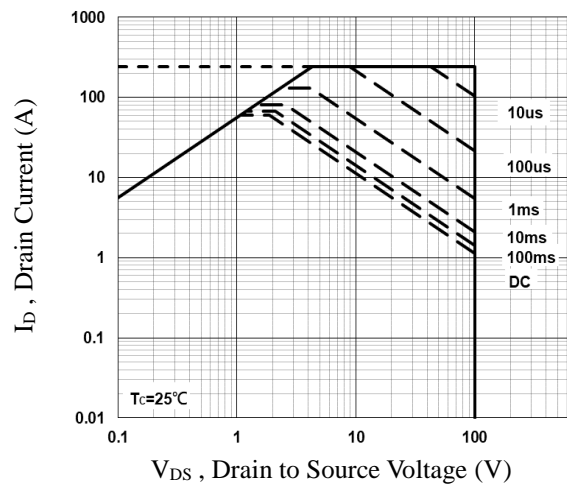


Fig.9 Maximum Safe Operation Area

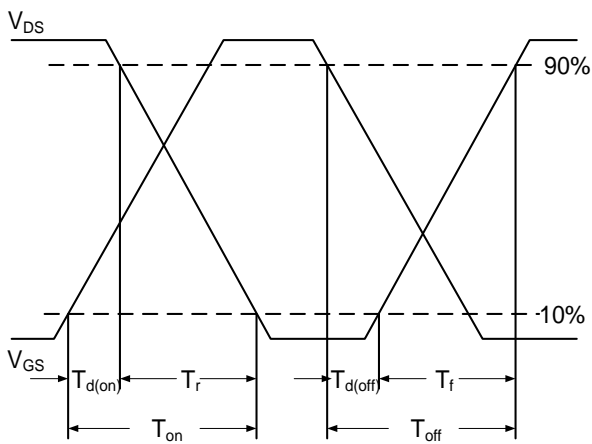


Fig.10 Switching Time Waveform

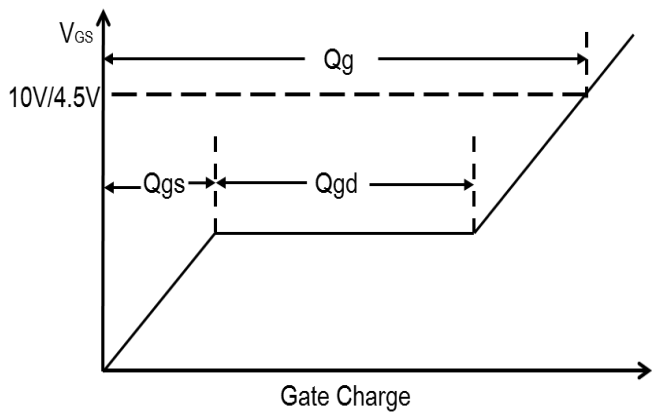
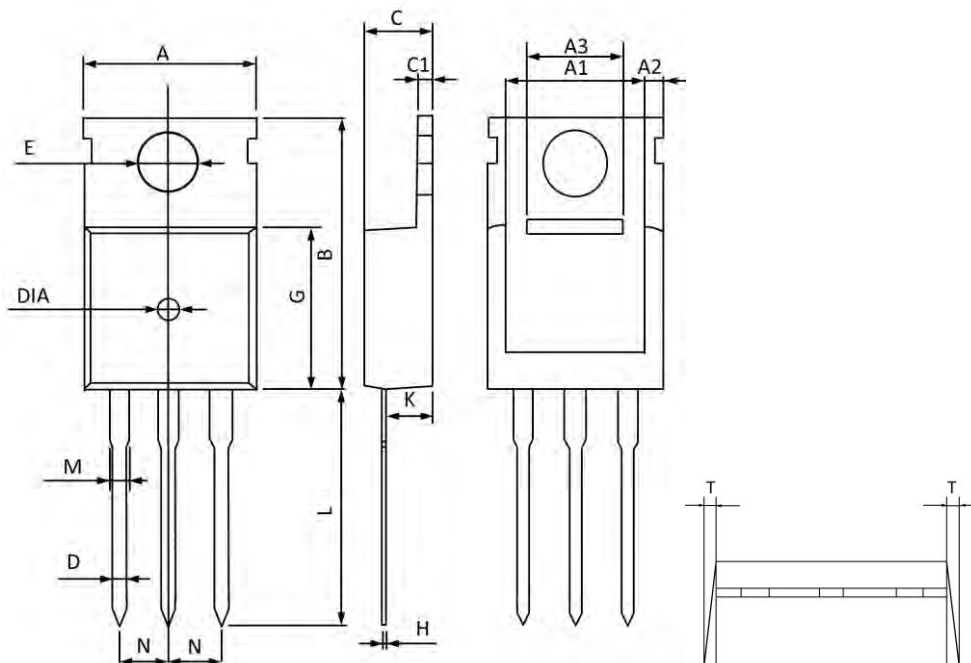


Fig.11 Gate Charge Waveform

100V N-Channel MOSFETs

TO-220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.