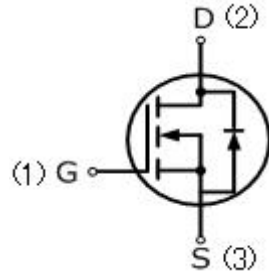


7N60TF

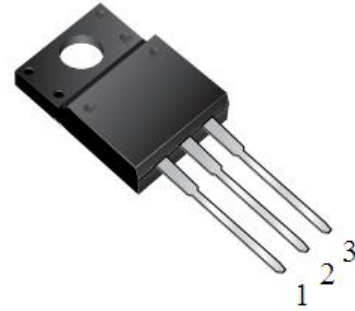
7 Amps,600 Volts N-CHANNEL Power MOSFET

FEATURE

- 7A,600V, $R_{DS(ON)MAX}=1.3\ \Omega$ @ $V_{GS}=10V/3.5A$
- Low gate charge
- Low C_{iss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



TO-220TF



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

Parameter	Symbol	7N60TF	UNIT
Drain-Source Voltage	V_{DSS}	600	V
Gate-Source Voltage	V_{GSS}	± 30	
Continuous Drain Current	I_D	7	A
Pulsed Drain Current(Note 1)	I_{DM}	28	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	400	mJ
Reverse Diode dV/dt (Note 3)	dv/dt	5.0	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$
Channel Temperature	T_{CH}	-55to+150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	260	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	TO-220TF	Units
Thermal resistance , Junction to Case	$R_{th(j-c)}$	3.57	$^\circ\text{C}/\text{W}$
Maximum Power Dissipation	P_D	35	W

Electrical Characteristics (T_c=25°C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	600	—	—	V
Breakdown Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C , I _D =250uA	—	0.67	—	V/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	—	—	1	uA
Gate-Body Leakage Current, Forward	I _{GSSF}	V _{GS} =30V, V _{DS} =0V	—	—	100	nA
Gate-Body Leakage Current, Reverse	I _{GSSR}	V _{GS} =-30V, V _{DS} =0V	—	—	-100	nA
On Characteristics						
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2	—	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.5A	—	1.0	1.3	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	—	1121	—	pF
Output Capacitance	C _{oss}		—	96	—	pF
Reverse Transfer Capacitance	C _{rss}		—	5.5	—	pF
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =300V, I _D =7A, R _G =10Ω (Note3,4)	—	18	—	ns
Turn-On Rise Time	t _r		—	22	—	ns
Turn-Off Delay Time	t _{d(off)}		—	40	—	ns
Turn-Off Fall Time	t _f		—	19	—	ns
Total Gate Charge	Q _g	V _{DS} =480V, I _D =7A, V _{GS} =10V, (Note3,4)	—	24	—	nC
Gate-Source Charge	Q _{gs}		—	4.8	—	nC
Gate-Drain Charge	Q _{gd}		—	9.5	—	nC
Drain-Source Body Diode Characteristics and Maximum Ratings						
Continuous Diode Forward Current	I _S		—	—	7	A
Pulsed Diode Forward Current	I _{SM}		—	—	28	A
Diode Forward Voltage	V _{SD}	I _S =7A, V _{GS} =0V	—	—	1.5	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =7A,	—	363	—	ns
Reverse Recovery Charge	Q _{rr}	dI _F /dt=100A/us, (Note3)	—	1920	—	nC

Notes

1. Repetitive Rating: pulse width limited by maximum junction temperature.
2. L=10mH, R_g=25Ω, I_{AS}=9A, T_J=25°C.
3. I_{SD}=7A, dI/dt ≤ 100A/us, V_{DD} ≤ BV_{DSS}, starting T_J=25°C, Pulse width ≤ 300us; duty cycle ≤ 2%.
4. Repetitive rating; pulse width limited by maximum junction temperature.

Test Circuit and Waveform

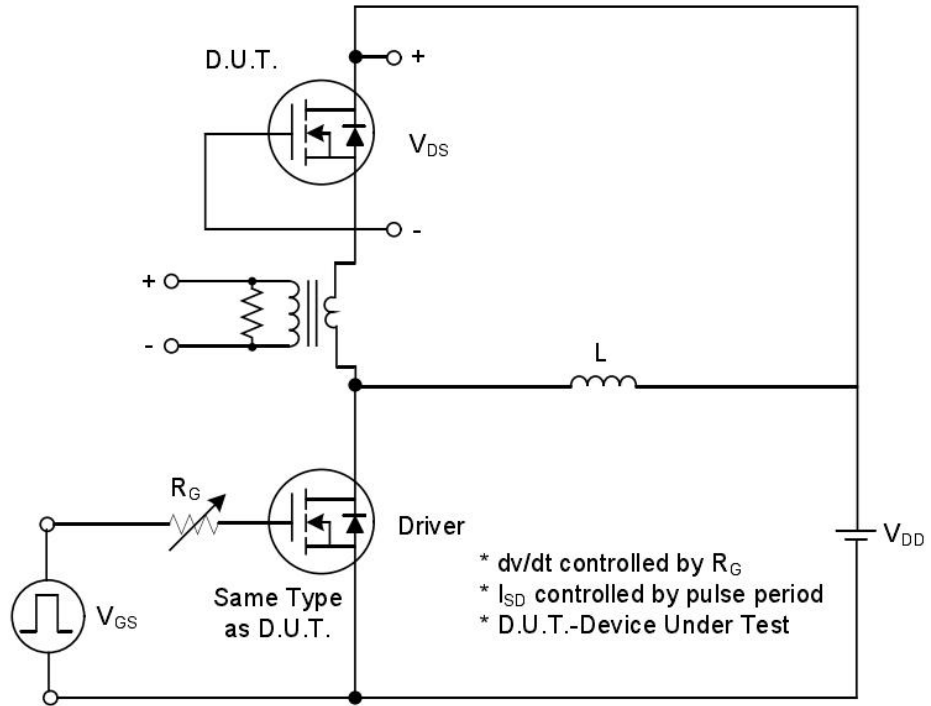


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

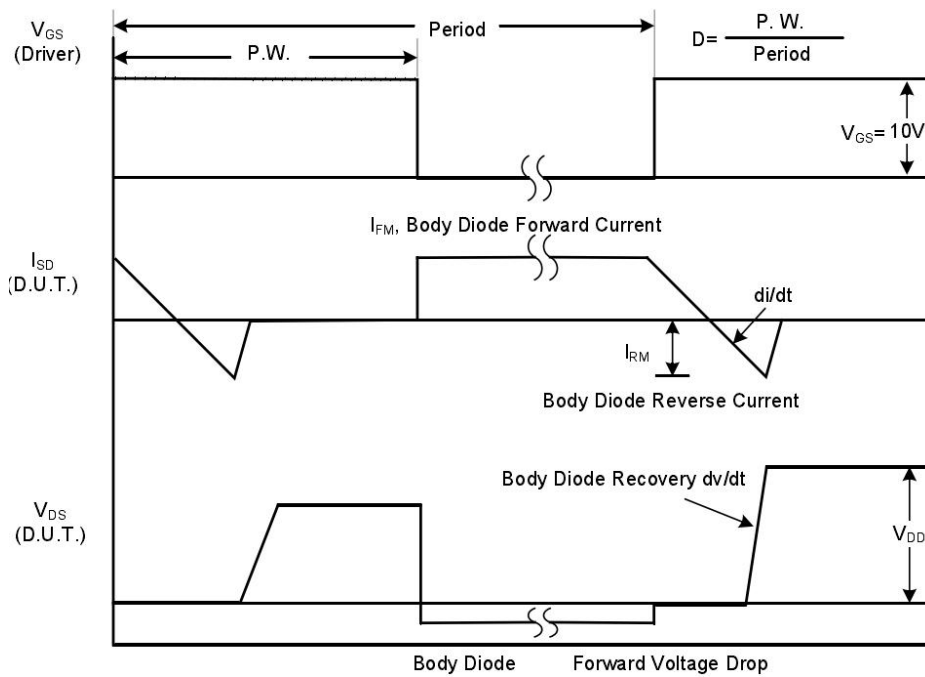


Fig. 1B Peak Diode Recovery dv/dt Waveforms

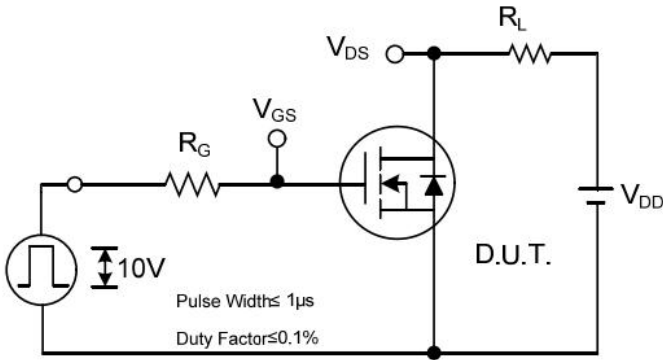


Fig. 2A Switching Test Circuit

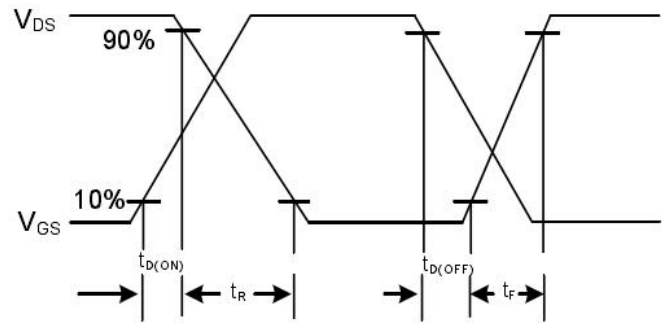


Fig. 2B Switching Waveforms

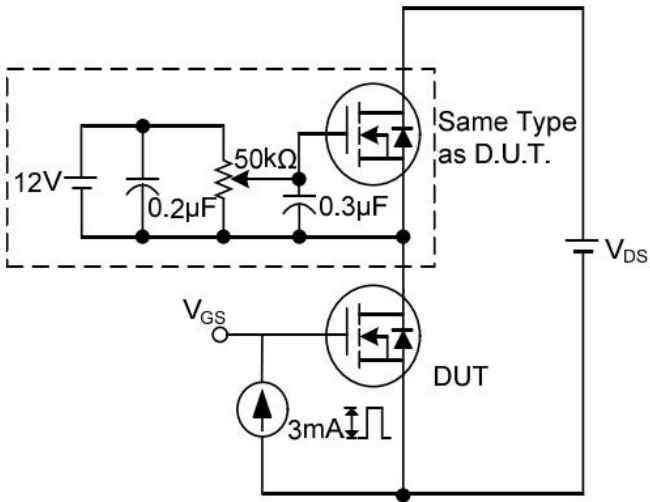


Fig. 3A Gate Charge Test Circuit

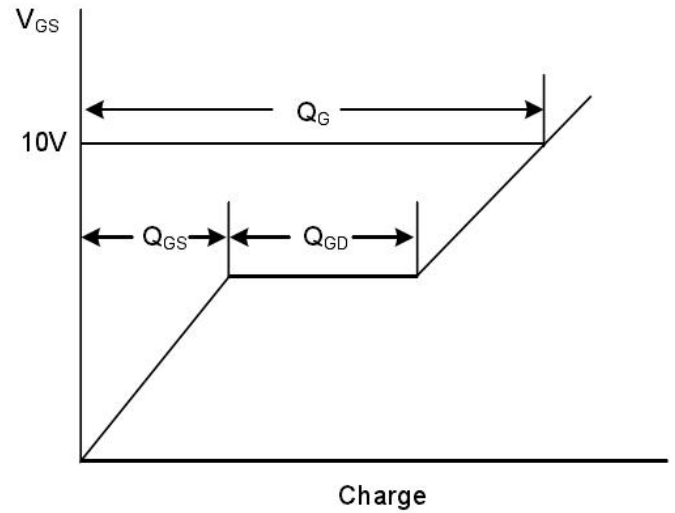


Fig. 3B Gate Charge Waveform

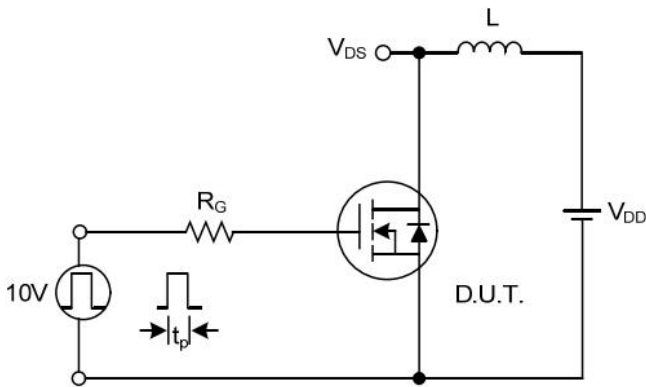


Fig. 4A Unclamped Inductive Switching Test Circuit

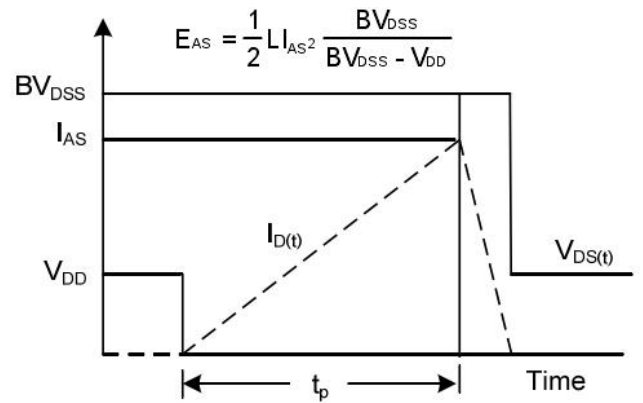
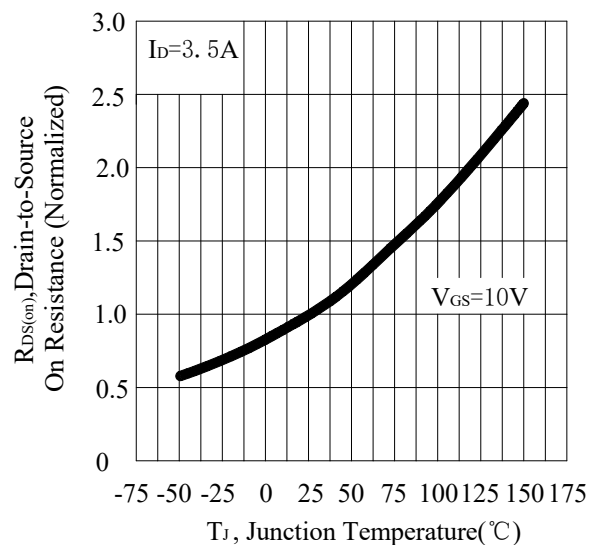
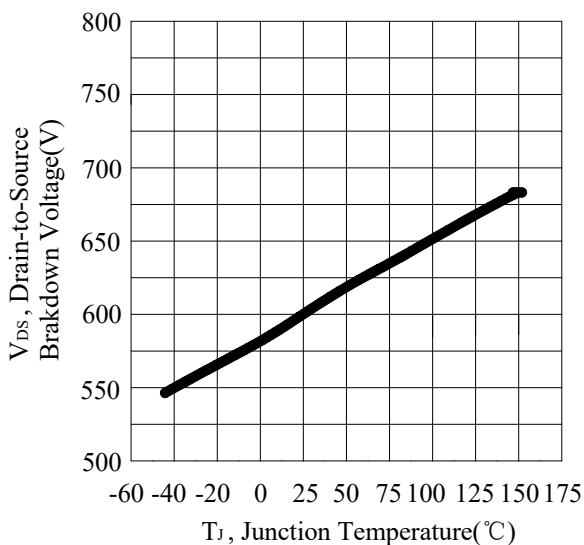
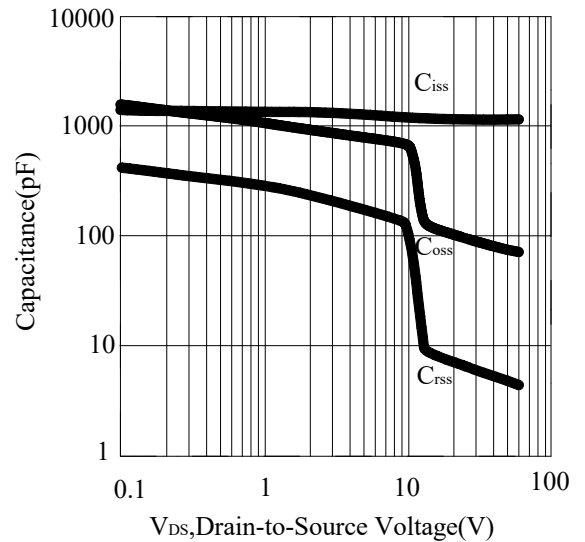
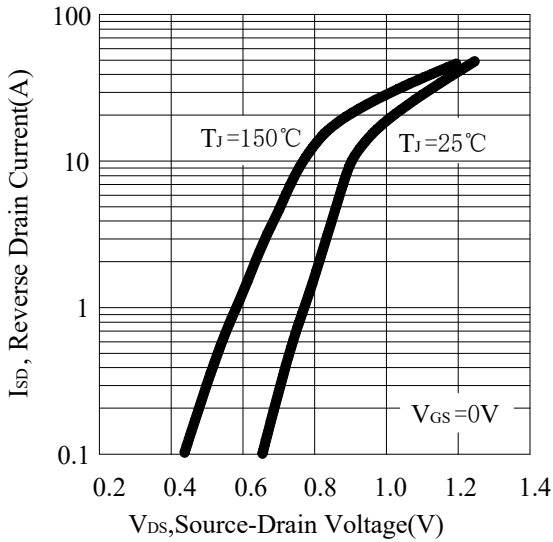
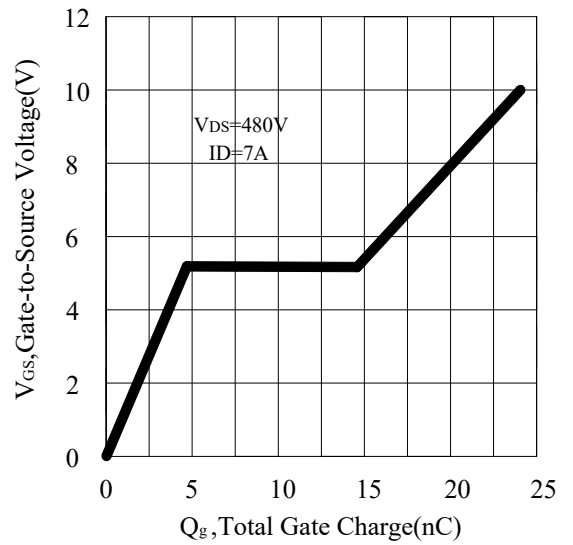
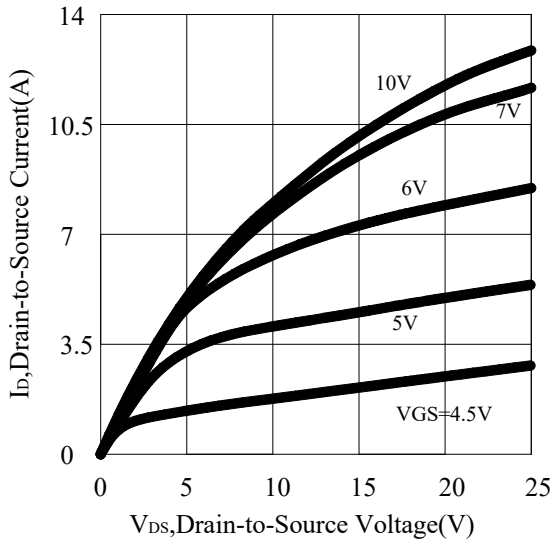
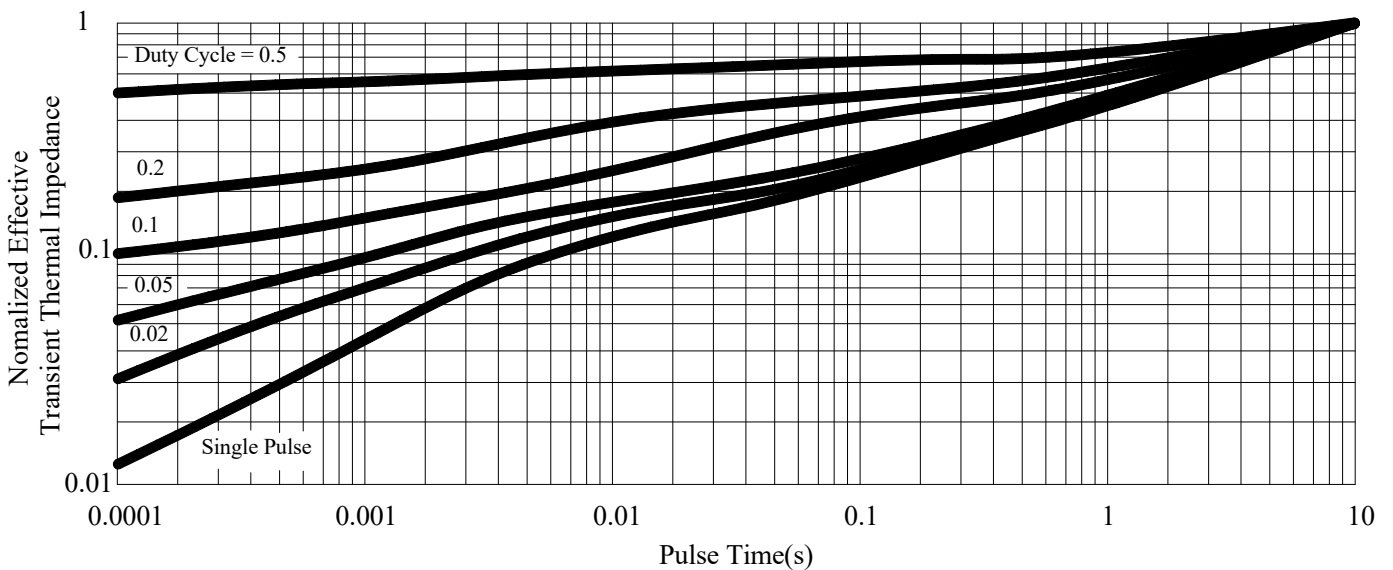
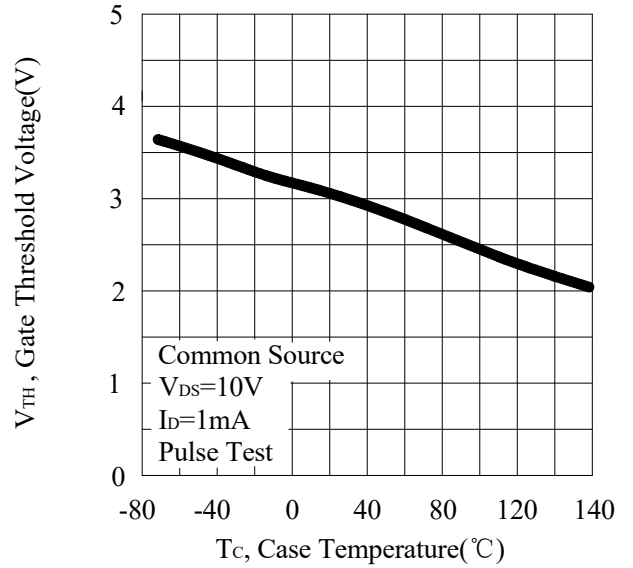
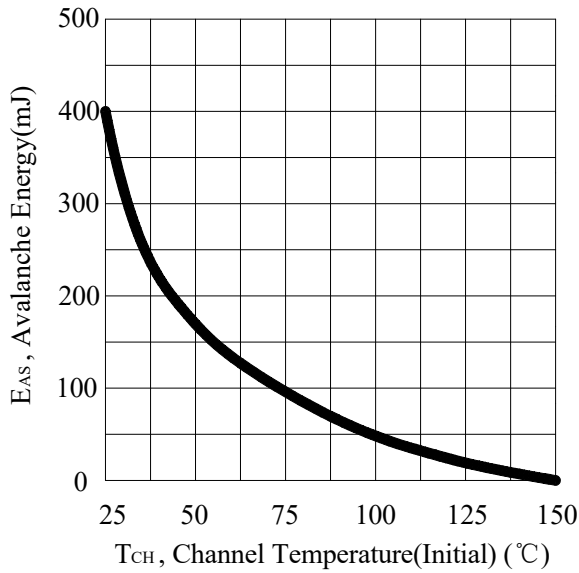
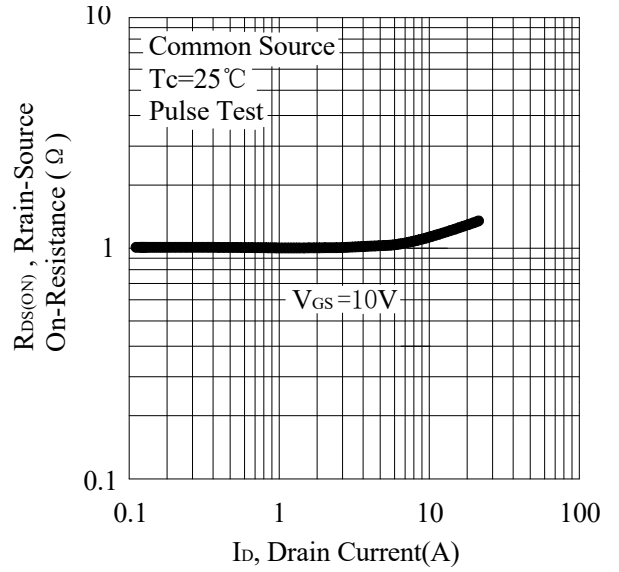
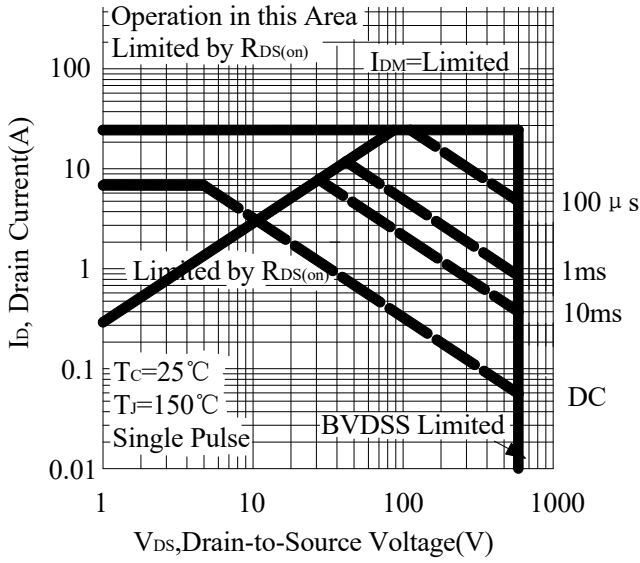


Fig. 4B Unclamped Inductive Switching Waveforms

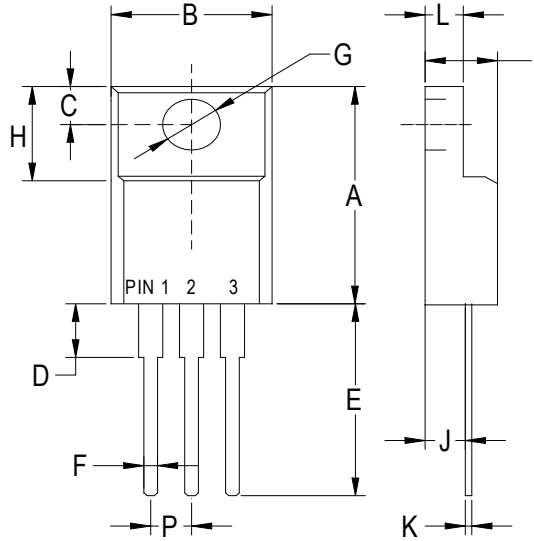
RATING AND CHARACTERISTIC CURVES





PACKAGE OUTLINE DIMENSIONS

TO-220TF



TO-220TF		
Dim	Min	Max
A	.590 (15.0)	.650 (16.5)
B	.393 (10.0)	.414 (10.5)
C	.118 (3.00)	.138 (3.50)
D	.118 (3.00)	.146 (3.70)
E	.512 (13.0)	.551 (14.0)
F	.028 (0.70)	.035 (0.90)
G	.114 (2.90)	.138 (3.50)
H	.255 (6.50)	.280 (7.10)
I	.173 (4.40)	.197 (5.00)
J	.102 (2.60)	.110 (2.80)
K	.018 (0.45)	.026 (0.65)
L	.092 (2.35)	.109 (2.75)
P	.890 (2.25)	.113 (2.85)