

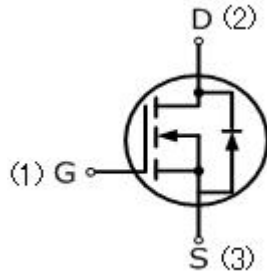


MIC-IRF730

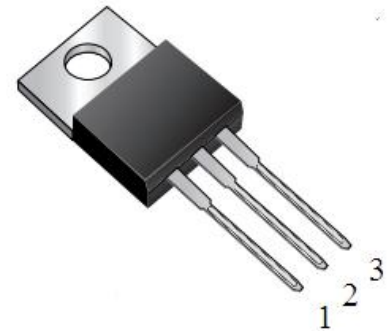
10 Amps, 500 Volts N-CHANNEL Power MOSFET

FEATURE

- 10A, 500V, $R_{DS(ON)MAX}=0.75 \Omega @V_{GS}=10V/5A$
- Low gate charge
- Low C_{iss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- Halogen free



TO-220AB



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

Parameter	Symbol	MIC-IRF730	UNIT
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	± 30	
Continuous Drain Current	I_D	10	A
Pulsed Drain Current (Note 1)	I_{DM}	40	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	580	mJ
Reverse Diode dv/dt (Note 3)	dv/dt	5	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55to+150	$^\circ C$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	260	$^\circ C$

Parameter	Symbol	MIC-IRF730	Units
Thermal resistance , Channel to Case	$R_{th(ch-c)}$	0.96	$^\circ C/W$
Thermal resistance , Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$
Maximum Power Dissipation	$T_C=25^\circ C$ P_D	130	W



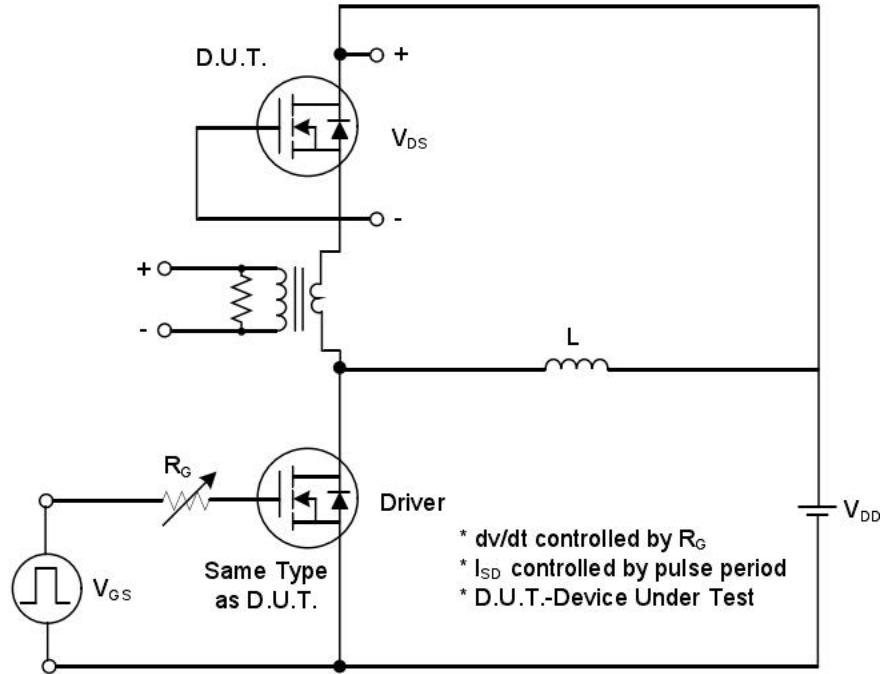
Electrical Characteristics ($T_c=25^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu\text{A}$	500	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V$	—	—	1	μA
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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2	—	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	—	0.5	0.75	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	—	1620	—	pF
Output Capacitance	C_{oss}		—	154	—	pF
Reverse Transfer Capacitance	C_{rss}		—	8.4	—	pF
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=250V, I_D=10A,$ $R_G=10\Omega$ (Note3,4)	—	26	—	ns
Turn-On Rise Time	t_r		—	20	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	52	—	ns
Turn-Off Fall Time	t_f		—	21	—	ns
Total Gate Charge	Q_g	$V_{DS}=400V, I_D=10A,$ $V_{GS}=10V$, (Note3,4)	—	32	—	nC
Gate-Source Charge	Q_{gs}		—	7.9	—	nC
Gate-Drain Charge	Q_{gd}		—	12	—	nC
Drain-Source Body Diode Characteristics and Maximum Ratings						
Continuous Diode Forward Current	I_S		—	—	10	A
Pulsed Diode Forward Current	I_{SM}		—	—	40	A
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$	—	—	1.5	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=10A,$ $dI_F/dt=100A/\mu\text{s}$, (Note4)	—	411	—	ns
Reverse Recovery Charge	Q_{rr}		—	2.588	—	μC

Notes

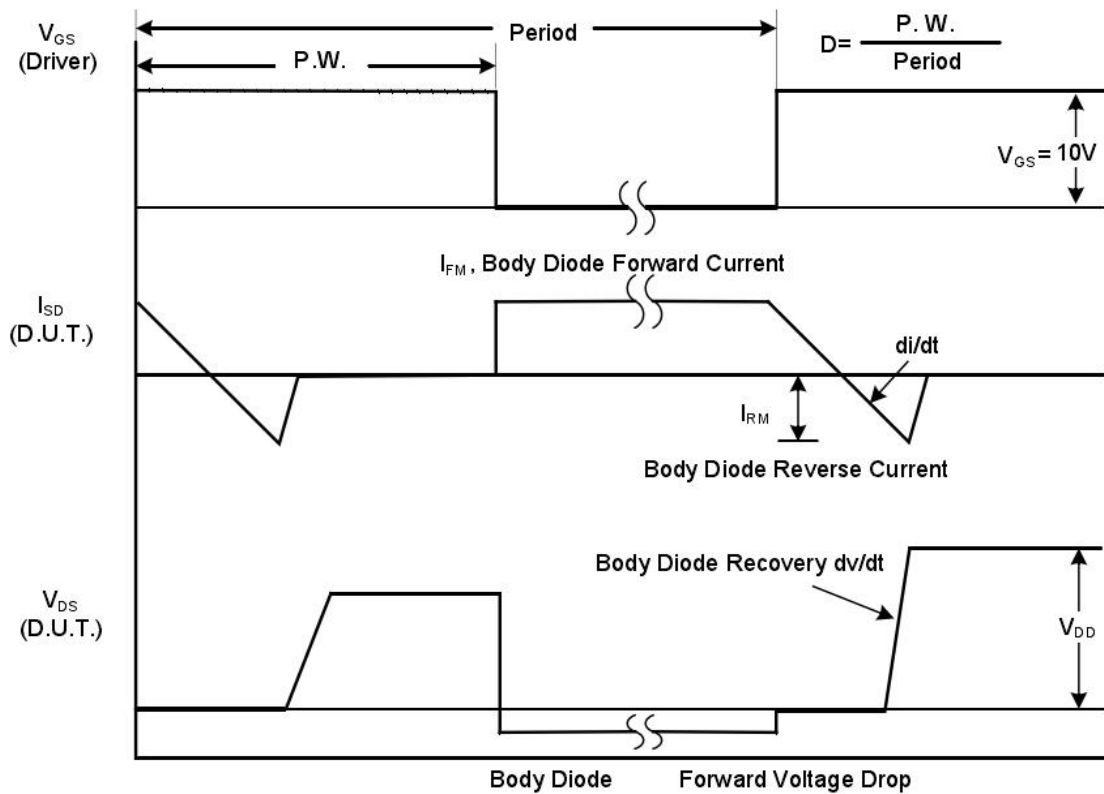
1. Repetitive Rating; pulse width limited by maximum junction temperature.
2. $L=10\text{mH}, I_{AS}=10.8\text{A}$, starting $T_J=25^\circ\text{C}$.
3. $I_{SD}=10A, dI/dt \leq 100A/\mu\text{s}, V_{DD} \leq BV_{DSS}$, starting $T_J=25^\circ\text{C}$, Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
4. Repetitive rating; pulse width limited by maximum junction temperature.



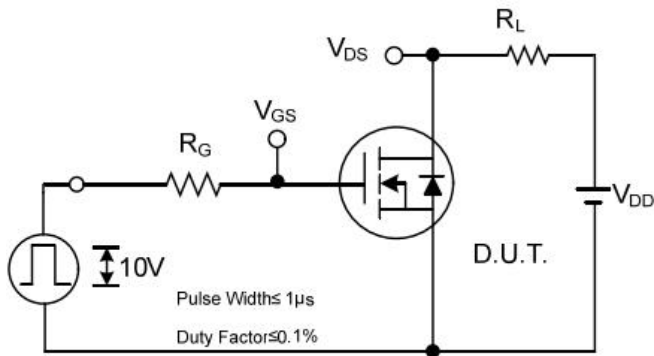
TEST CIRCUIT AND WAVEFORM



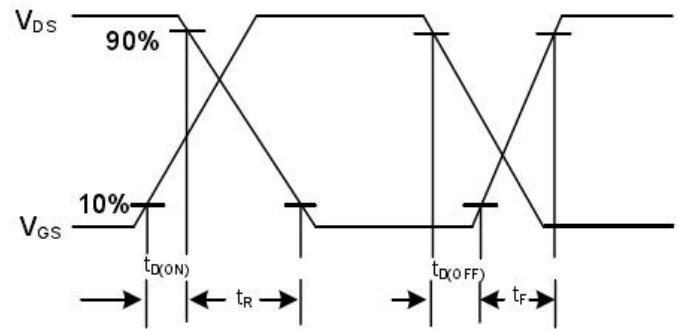
Peak Diode Recovery dv/dt Test Circuit



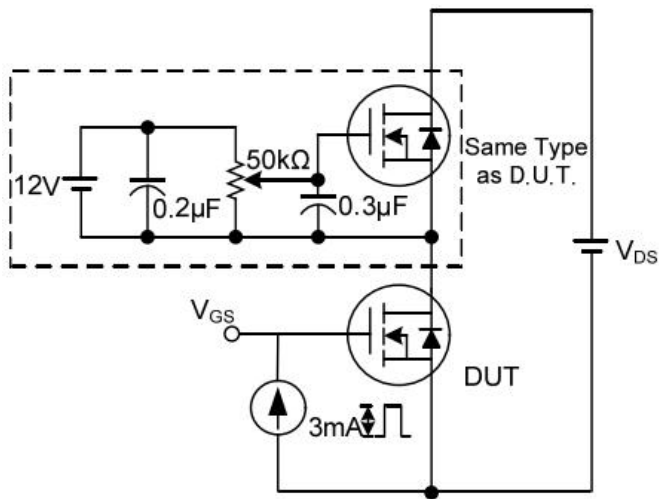
Peak Diode Recovery dv/dt Waveforms



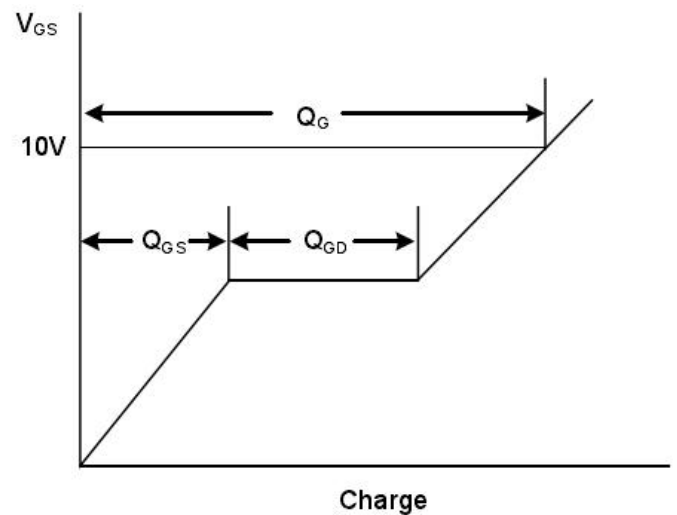
Switching Test Circuit



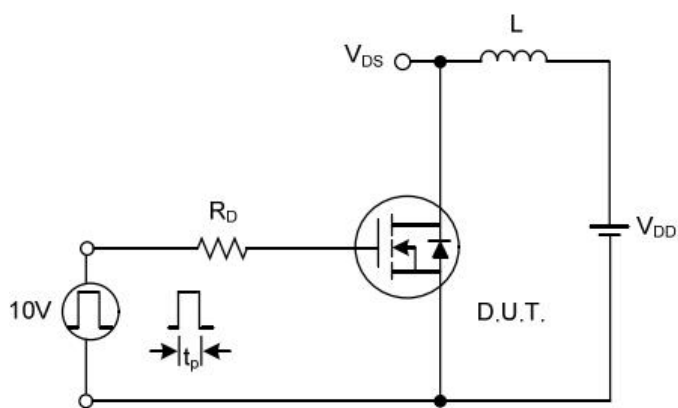
Switching Waveforms



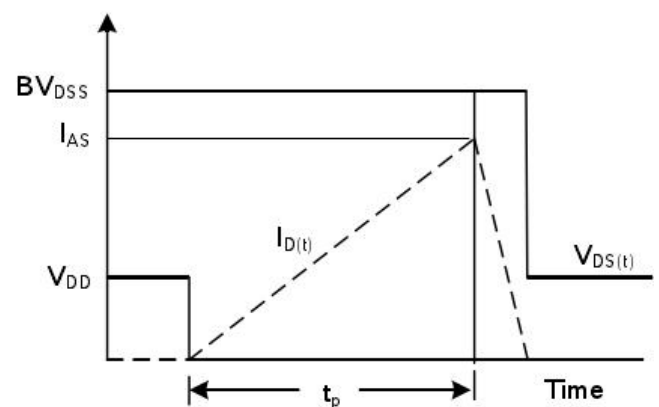
Gate Charge Test Circuit



Gate Charge Waveform



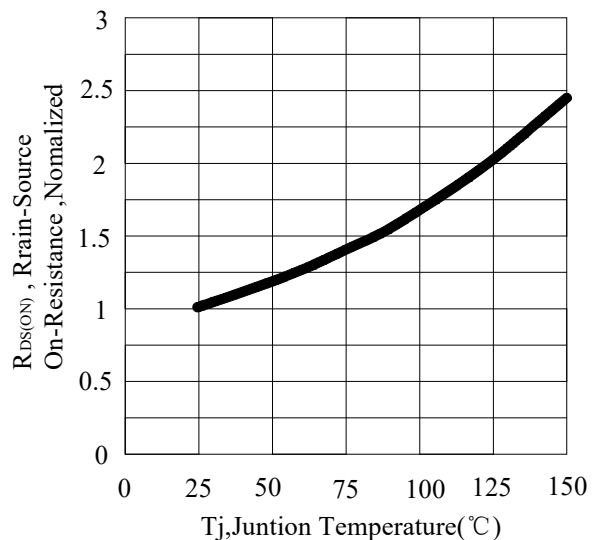
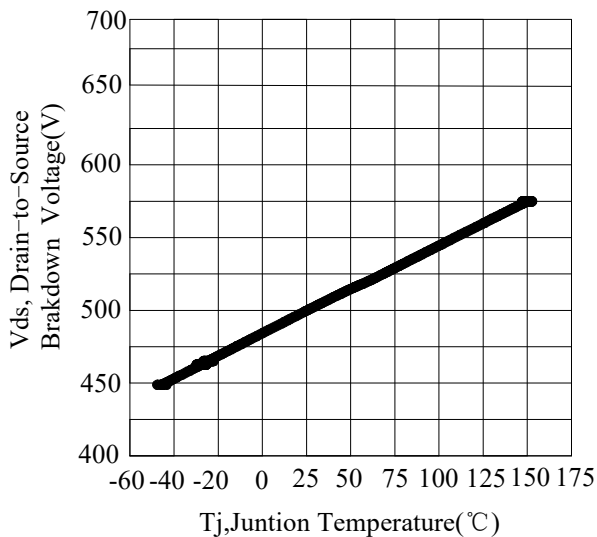
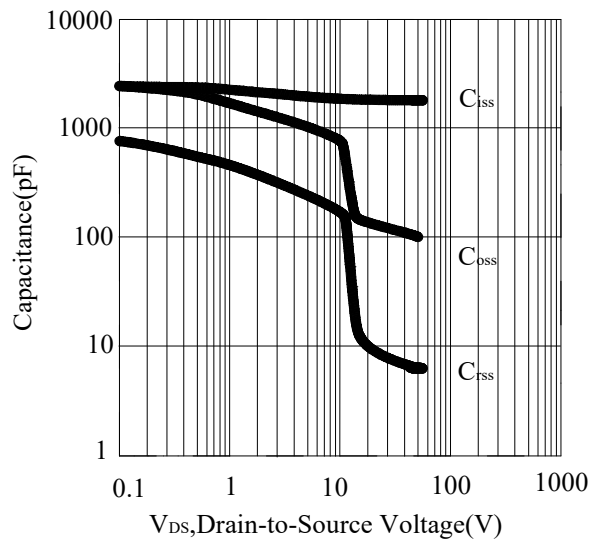
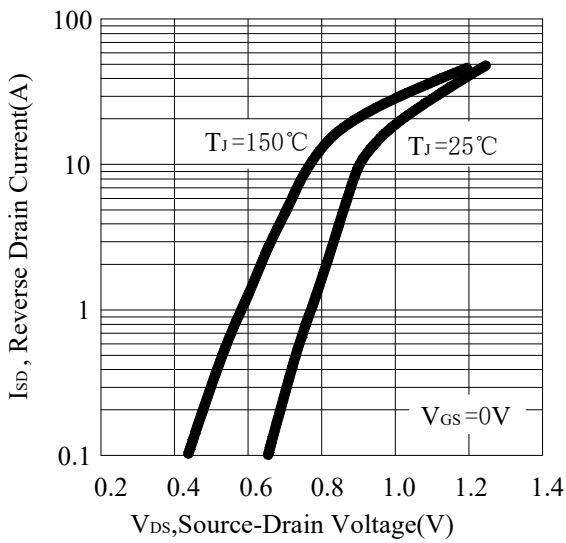
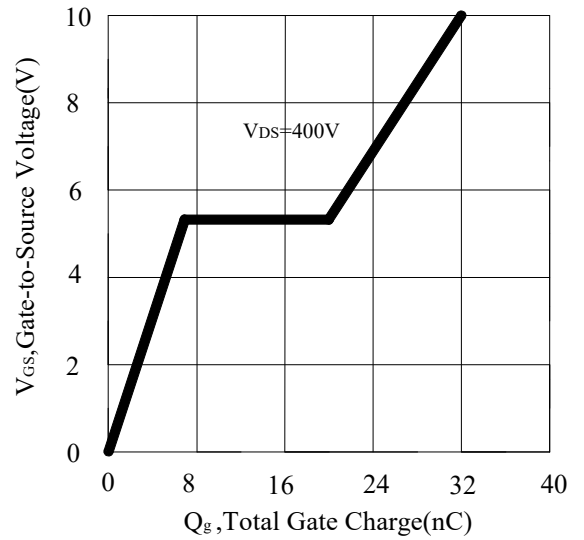
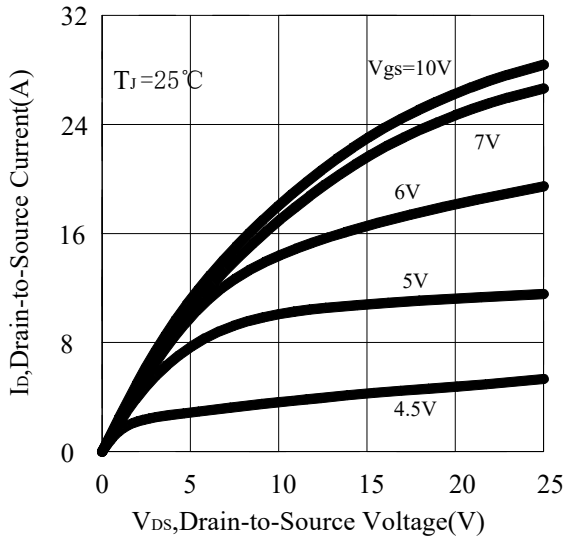
Unclamped Inductive Switching Test Circuit

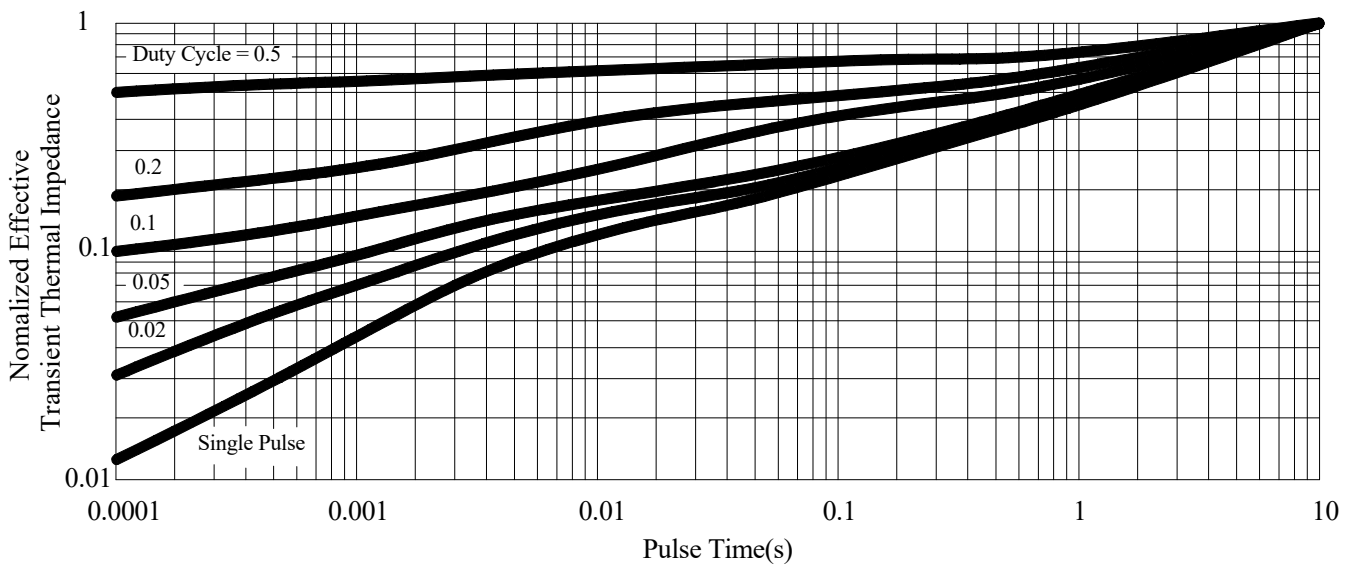
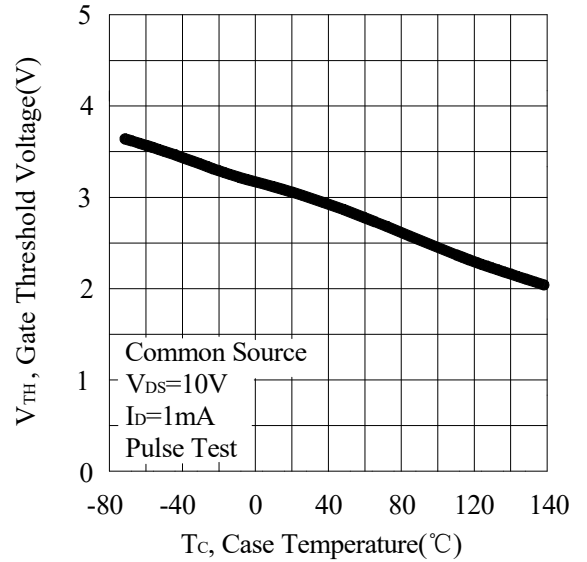
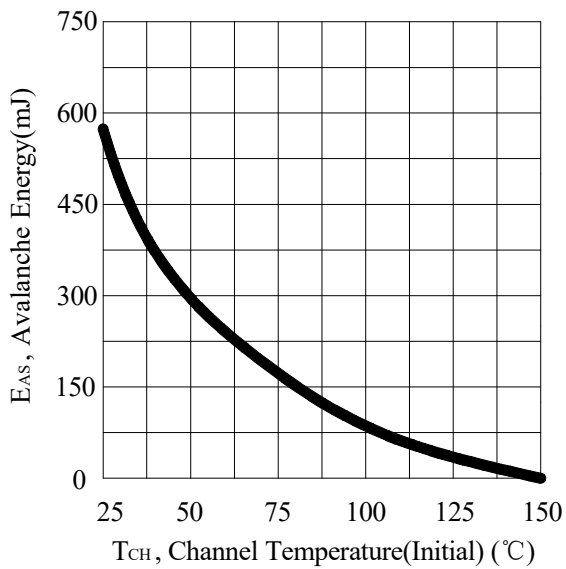
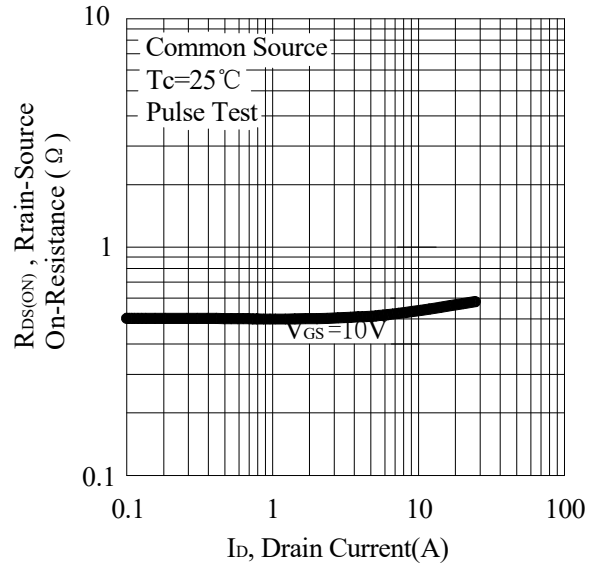
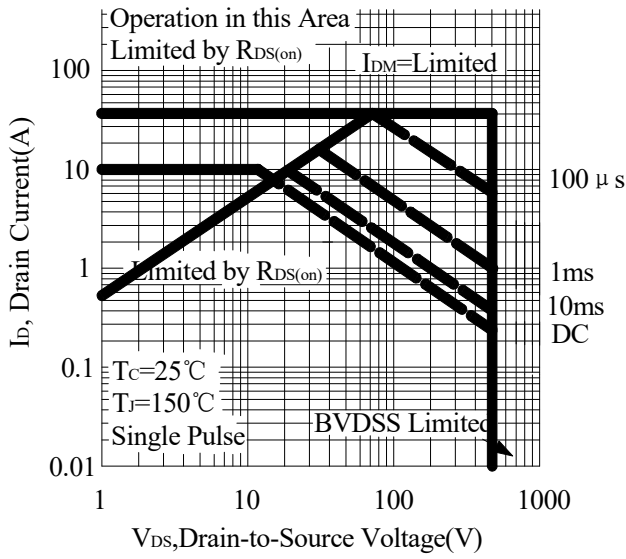


Unclamped Inductive Switching Waveforms



RATING AND CHARACTERISTIC CURVES

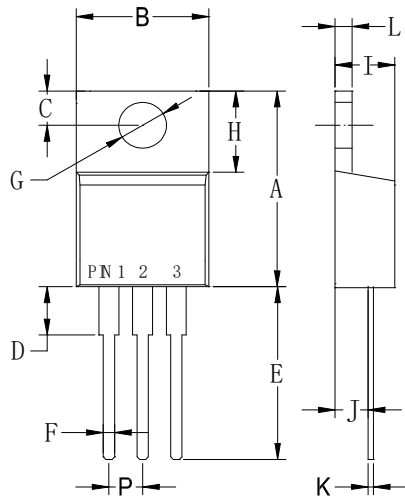






PACKAGE OUTLINE DIMENSIONS

TO-220AB



TO-220AB		
Dim	Min	Max
A	.573 (14.55)	.603 (15.32)
B	—	.412 (10.5)
C	.103 (2.62)	.113 (2.87)
D	.140 (3.56)	.160 (4.06)
E	.510 (13.0)	.560 (14.3)
F	.027 (0.68)	.037 (0.94)
G	.148 (3.74)	.154 (3.91)
H	.230 (5.84)	.270 (6.86)
I	.175 (4.44)	.185 (4.86)
J	.100 (2.54)	.110 (2.79)
K	.014 (0.35)	.025 (0.64)
L	.045 (1.14)	.055 (1.40)
P	.095 (2.41)	.105 (2.67)

Dimensions in inches and (millimeters)