

■ PRODUCT CHARACTERISTICS

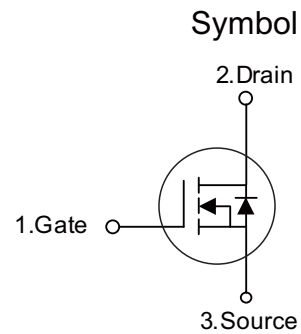
VDSS	700V
$R_{DS(on)typ}(V_{GS}=10V)$	1.38Ω
Qg@type	35nC
ID	7A

■ APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- UPS

■ FEATURES

- \* Fast Switching
- \* With 100% Avalanche Tested



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT7N70F	TO-220F	50 pieces/Tube
N/A	MOT7N70A	TO-220	50 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	700	V
Gate-Source Voltage	$V_{GSS}$	±30	V
Drain Current	Continuous	$I_D$	7
	Pulsed (Note 2)	$I_{DM}$	14
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	480
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.2	V/ns
Power Dissipation	$P_D$	40	W
Junction Temperature	$T_J$	+150	°C
Storage Temperature Range	$T_{STG}$	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by maximum junction temperature.
3.  $L=60\text{mH}$ ,  $I_{AS}=4.0\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$
4.  $I_{SD} \leq 7.0\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J=25^\circ\text{C}$

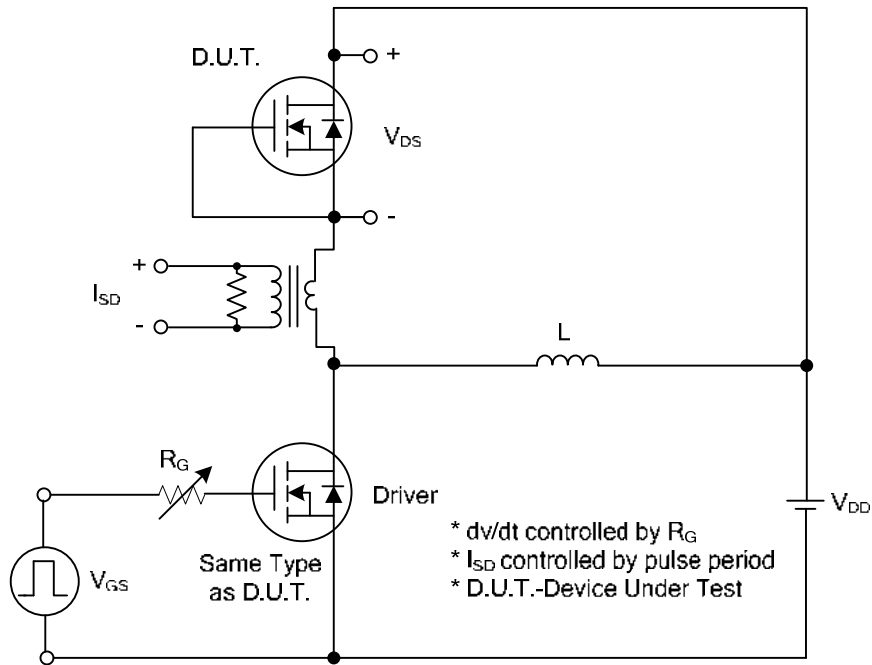
■ ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	700	-	-	V
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=700V, V_{GS}=0V$	-	-	10	$\mu A$
Gate-Source Leakage Current	Forward	$I_{GSS}$	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
	Reverse		$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
On characteristics							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.5A$	-	1.38	1.5	$\Omega$
Dynamic characteristics							
Input Capacitance		$C_{ISS}$	$V_{GS}=0V, V_{DS}=25V, f=1.0\text{MHz}$	-	868	-	pF
Output Capacitance		$C_{OSS}$		-	125	-	pF
Reverse Transfer Capacitance		$C_{RSS}$		-	30	-	pF
Switching characteristics							
Total Gate Charge (Note 1)		$Q_G$	$V_{DS}=300V, V_{GS}=10V, I_D=7A, I_G=1\text{mA}$ (Note 1, 2)	-	35	-	nC
Gate to Source Charge		$Q_{GS}$		-	7.4	-	nC
Gate to Drain Charge		$Q_{GD}$		-	12.6	-	nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	$V_{DD}=30V, V_{GS}=10V, I_D=0.5A, R_G=25\Omega$ (Note 1, 2)	-	40	-	ns
Rise Time		$t_R$		-	102	-	ns
Turn-OFF Delay Time		$t_{D(OFF)}$		-	264	-	ns
Fall-Time		$t_F$		-	172	-	ns
Source-drain diode ratings and characteristics							
Maximum Body-Diode Continuous Current		$I_S$		-	-	7	A
Maximum Body-Diode Pulsed Current		$I_{SM}$		-	-	14	A
Drain-Source Diode Forward Voltage (Note 1)		$V_{SD}$	$I_S=7.0A, V_{GS}=0V$	-	-	1.4	V
Body Diode Reverse Recovery Time (Note 1)		$t_{rr}$	$I_S=7.0A, V_{GS}=0V,$	-	420	-	ns
Body Diode Reverse Recovery Charge		$Q_{rr}$	$di_F/dt=100A/\mu s$	-	4	-	$\mu C$

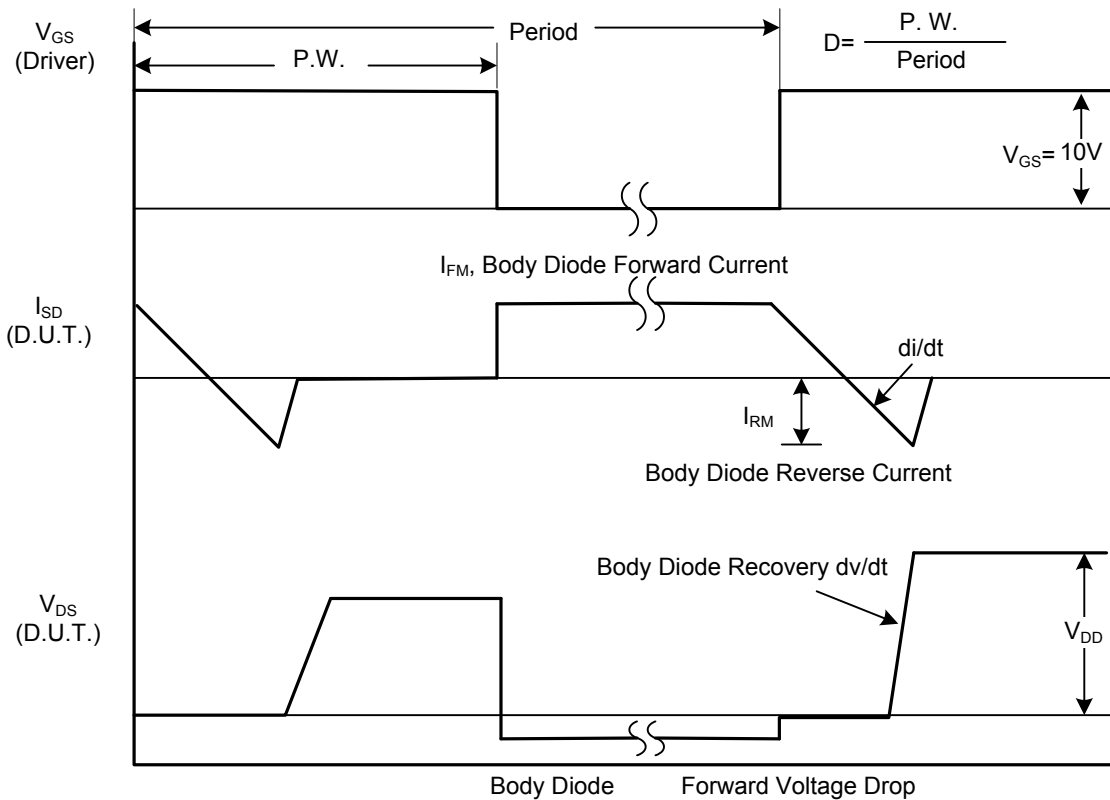
 Notes: 1. Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

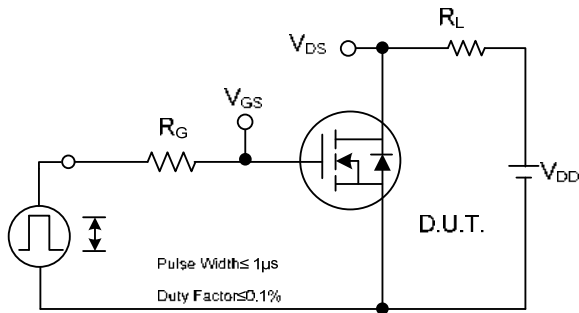


Peak Diode Recovery  $dv/dt$  Test Circuit

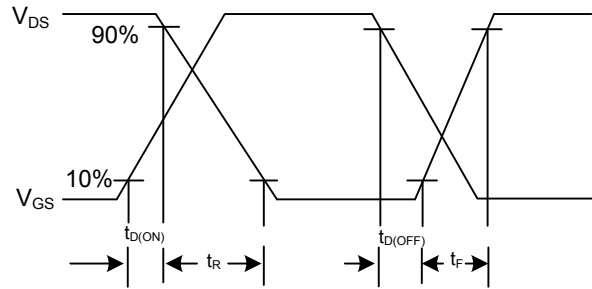


Peak Diode Recovery  $dv/dt$  Waveforms

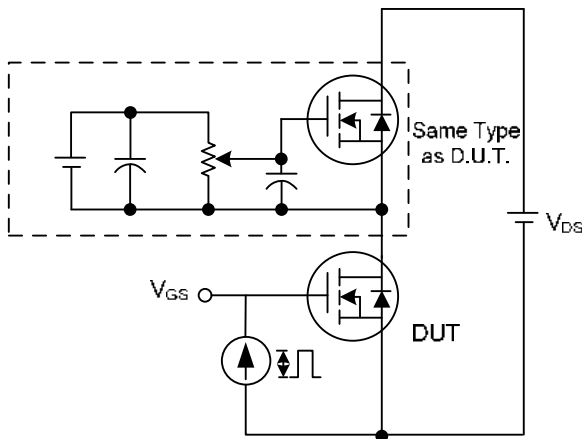
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



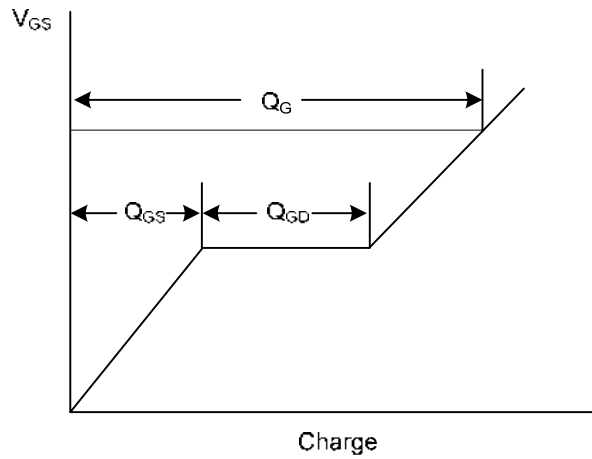
Switching Test Circuit



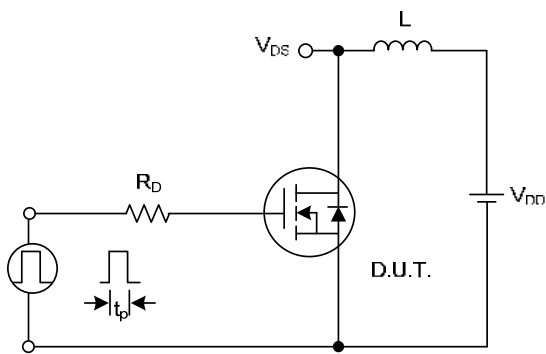
Switching Waveforms



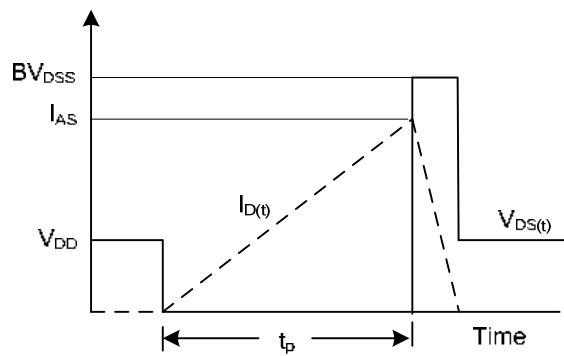
Gate Charge Test Circuit



Gate Charge Waveform

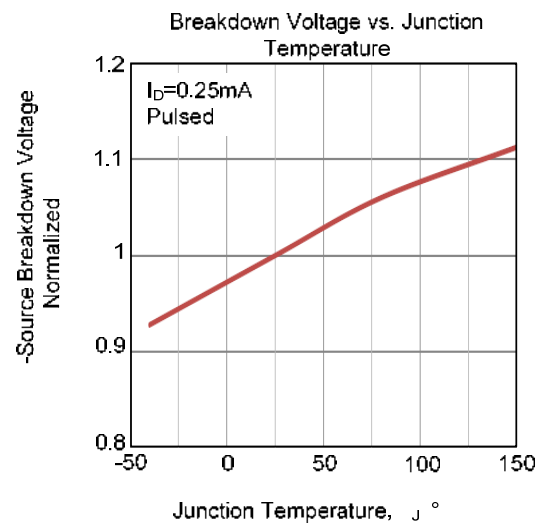
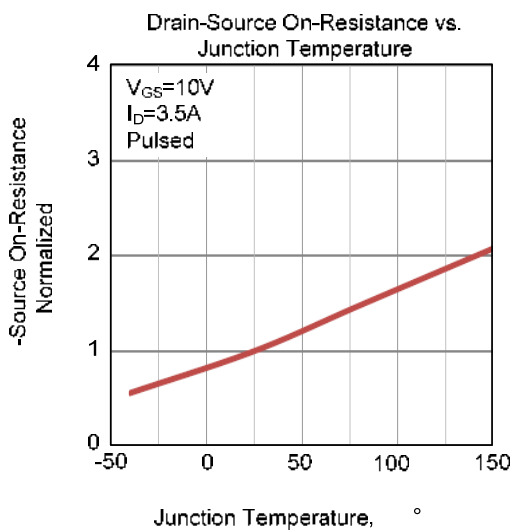
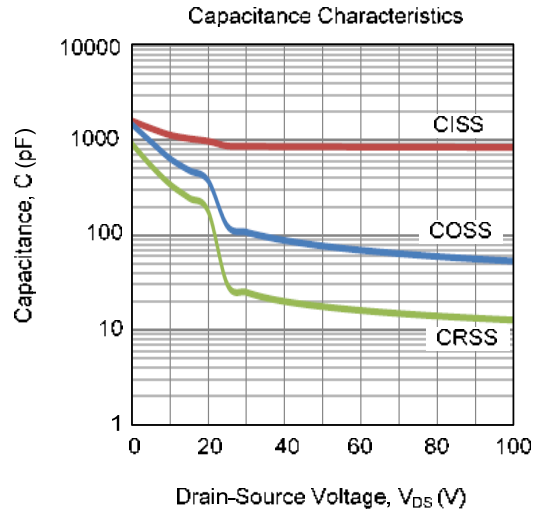
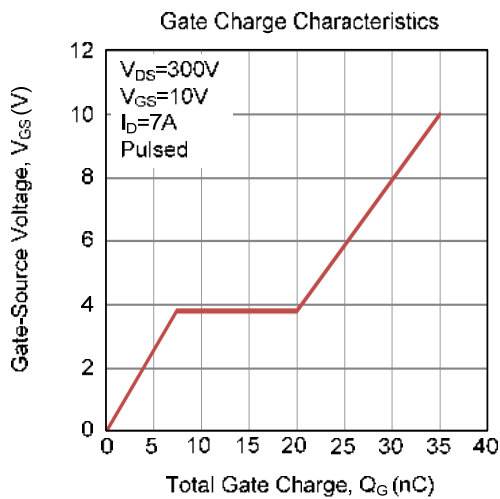
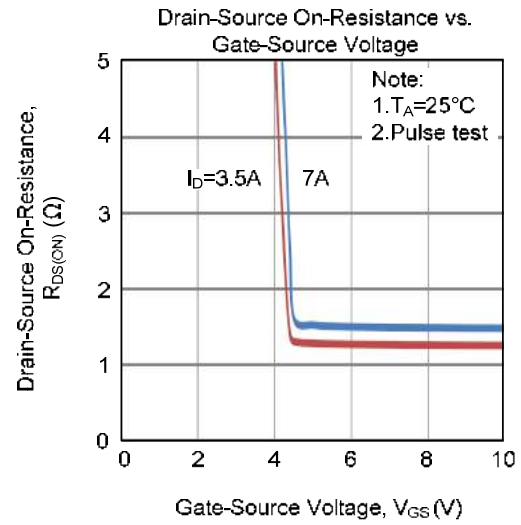
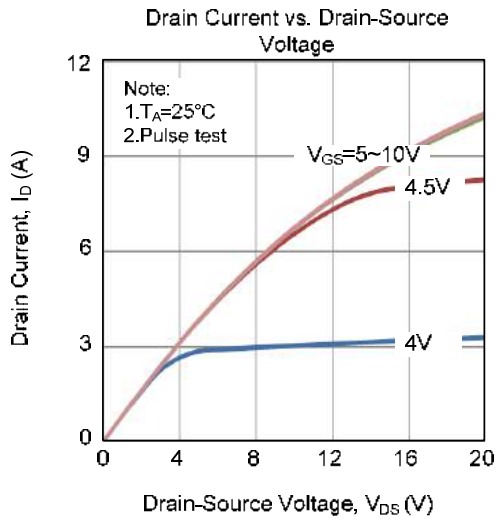


Unclamped Inductive Switching Test Circuit

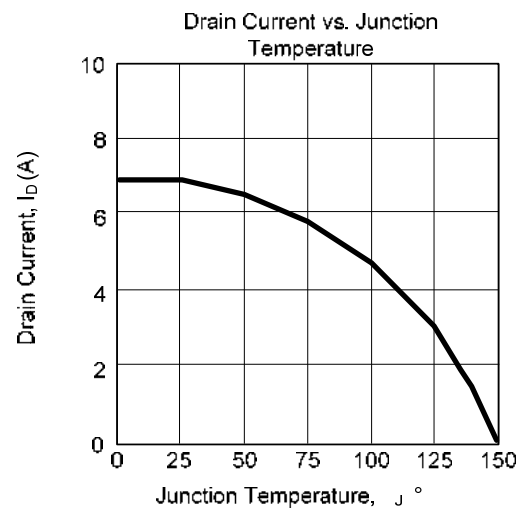
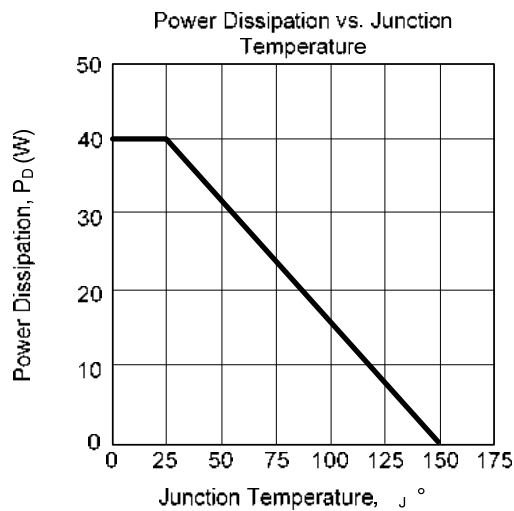
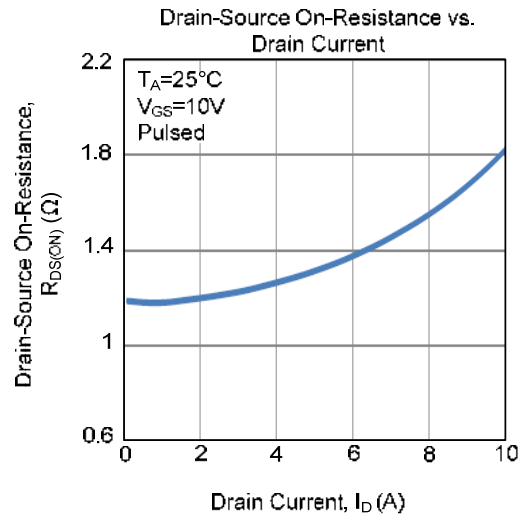
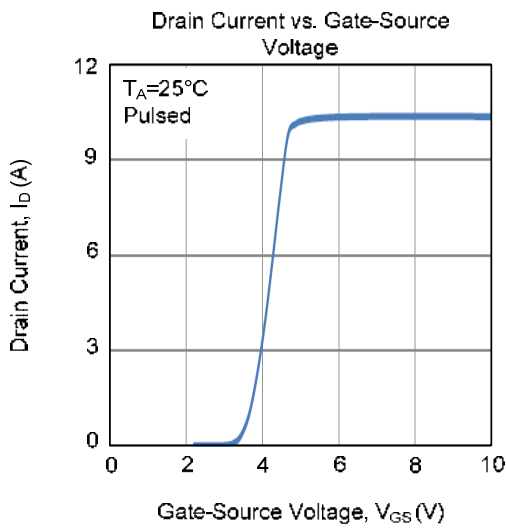
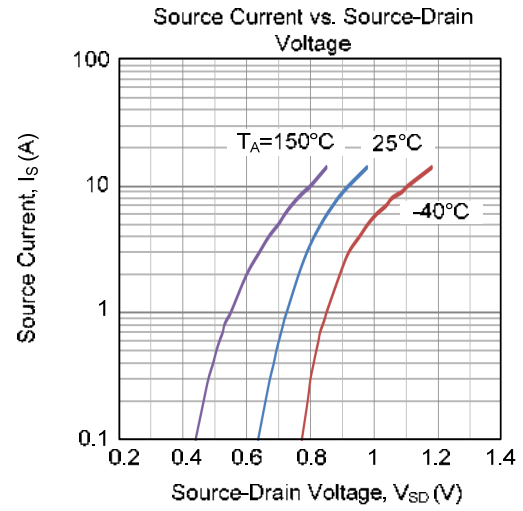
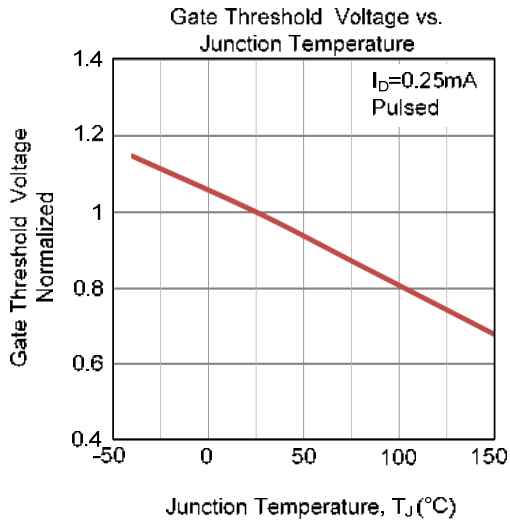


Unclamped Inductive Switching Waveforms

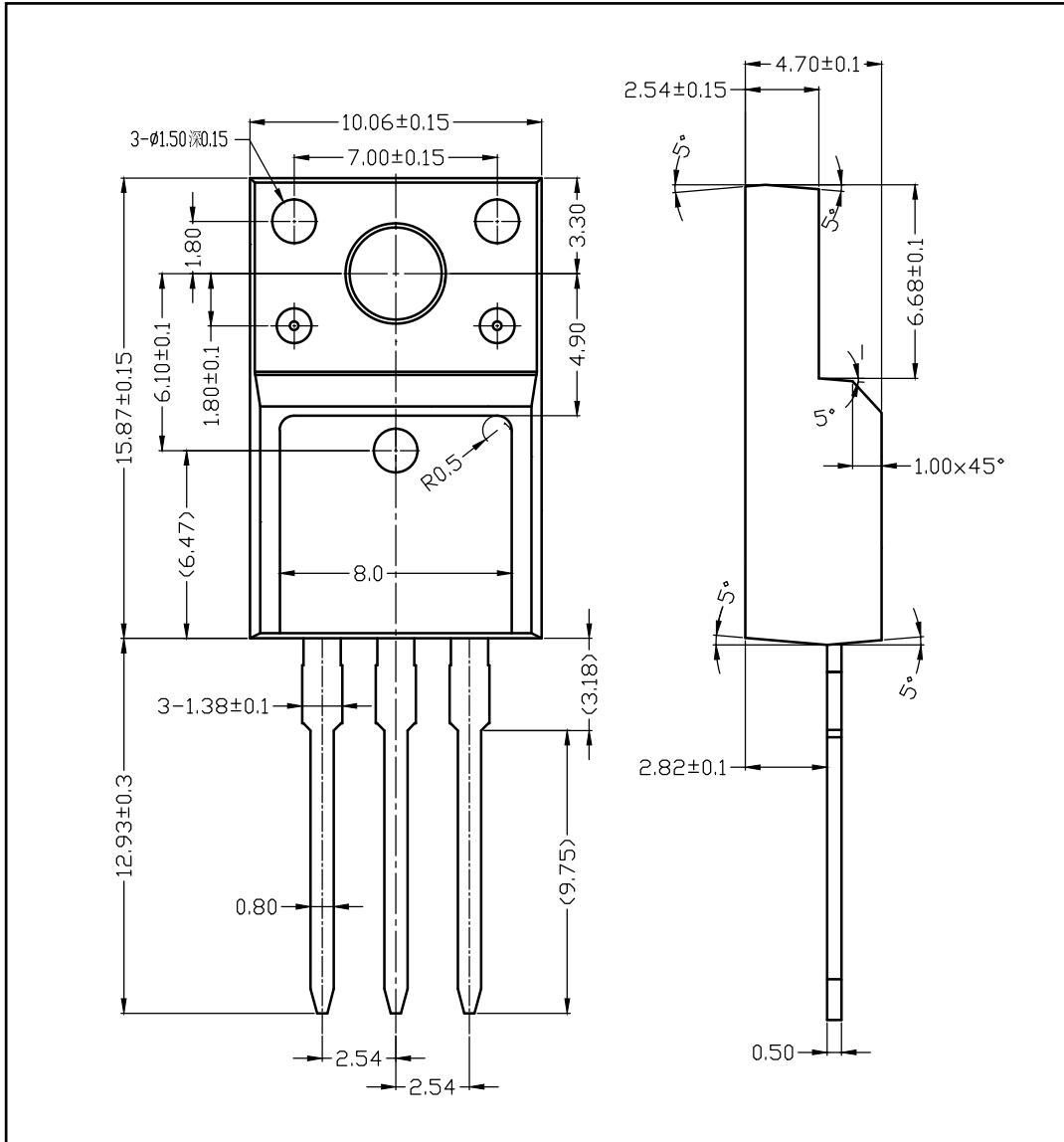
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

