

■ PRODUCT CHARACTERISTICS

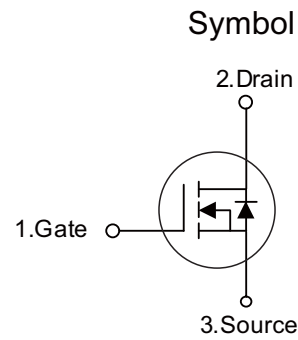
VDSS	700V
$R_{DS(on)Typ}(V_{GS} = 10V)$	1Ω
Qg@type	44nC
ID	10A

■ APPLICATIONS

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

■ FEATURES

- \* Ultra low gate charge
- \* Fast switching capability
- \* Avalanche energy tested
- \* Improved dv/dt capability, high ruggedness



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT10N70F	TO-220F	50 pieces/Tube
N/A	MOT10N70A	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	$I_D$	10
	Pulsed (Note 2)	$I_{DM}$	40
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	120
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.6	V/ns
Power Dissipation	TO-220	$P_D$	150
	TO-220F		35
Junction Temperature	$T_J$	+150	°C
Storage Temperature	$T_{STG}$	-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.  $L = 10\text{mH}$ ,  $I_{AS} = 5.0\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\ \Omega$  Starting  $T_J = 25^\circ\text{C}$

4.  $I_{SD} \leq 10\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^\circ\text{C}$

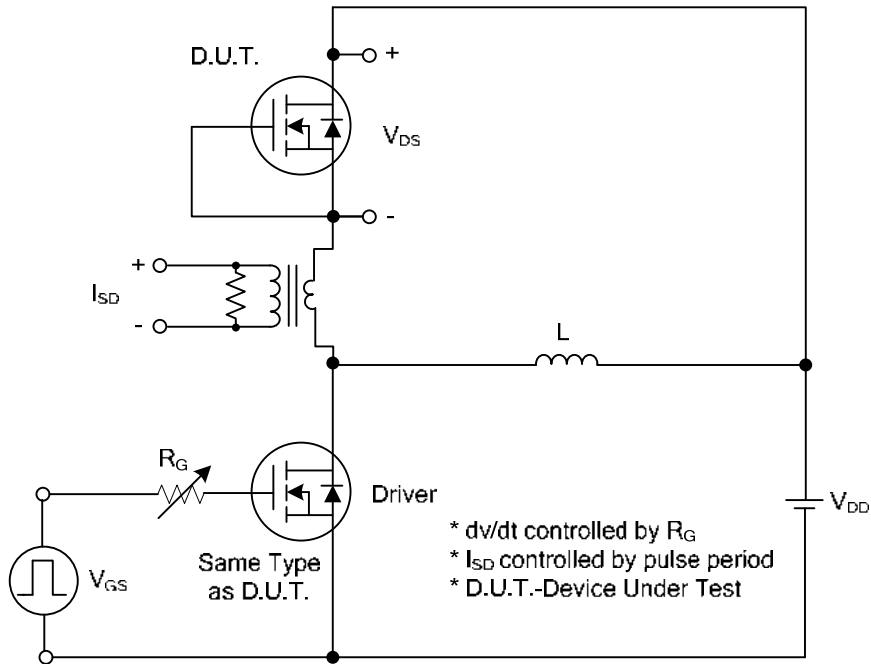
■ ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

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	$I_{GSS}$	-	-	100	nA
	Reverse				-100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5.0A$	-	1	1.1	$\Omega$
Dynamic characteristics						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=25V, f=1.0\text{ MHz}$	-	1400	-	pF
Output Capacitance	$C_{OSS}$		-	142	-	pF
Reverse Transfer Capacitance	$C_{RSS}$		-	10.4	-	pF
Switching characteristics						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=100V, V_{GS}=10V, I_D=10A$ $I_G=1\text{ mA}$ (Note 1, 2)	-	42	-	nC
Gate-source Charge	$Q_{GS}$		-	7.8	-	nC
Gate-drain Charge	$Q_{GD}$		-	6.6	-	nC
Switching characteristics						
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=100V, V_{GS}=10V, I_D=10A$ , $R_G=25\Omega$ (Note 1, 2)	-	12	-	ns
Rise Time	$t_R$		-	19	-	ns
Turn-off Delay Time	$t_{D(OFF)}$		-	92	-	ns
Fall-Time	$t_F$		-	41	-	ns
Source-drain diode ratings and characteristics						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$		-	-	10	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$		-	-	20	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$V_{GS}=0V, I_S=10A$	-	-	1.4	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$V_{GS}=0V, I_S=10A$ , $dI_F/dt=100A/\mu s$ (Note1)	-	368	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	4.6	-	$\mu C$

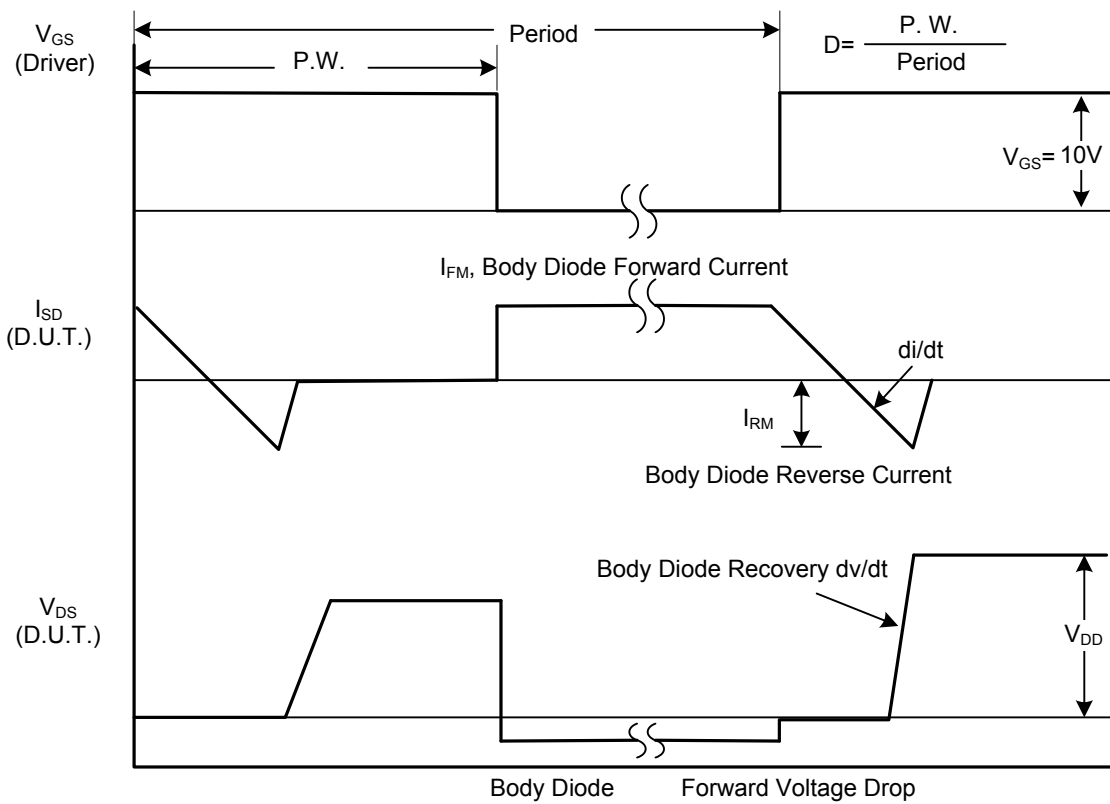
 Notes: 1. Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

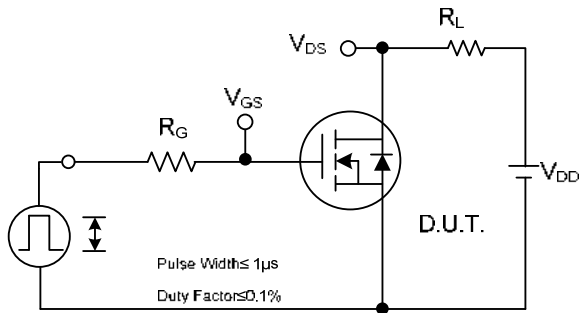


Peak Diode Recovery dv/dt Test Circuit

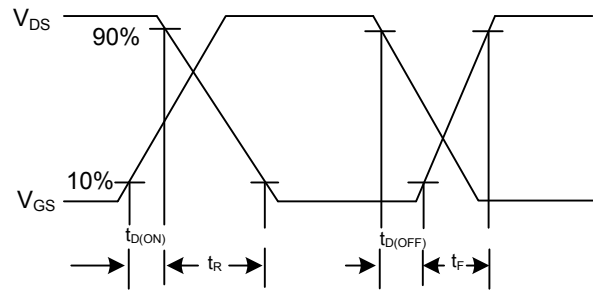


Peak Diode Recovery dv/dt Waveforms

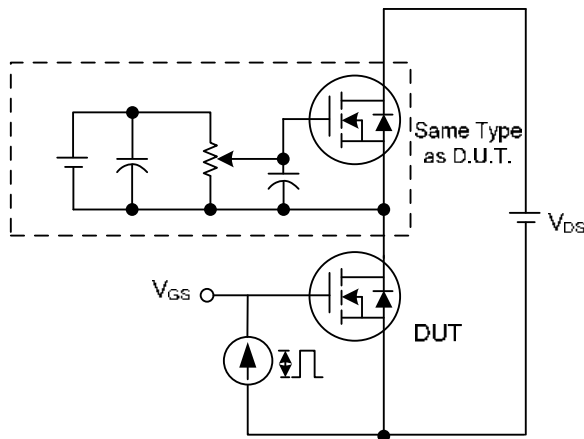
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



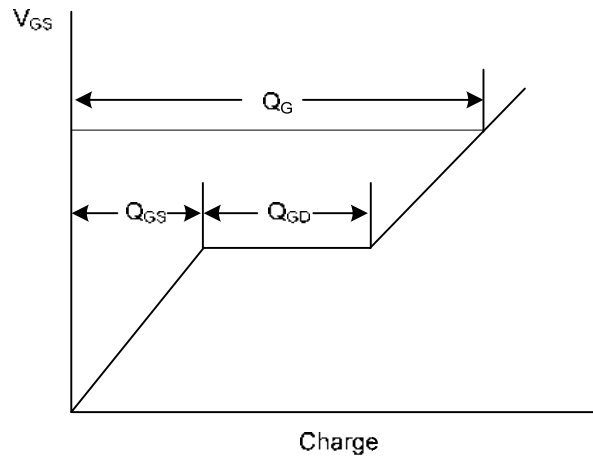
Switching Test Circuit



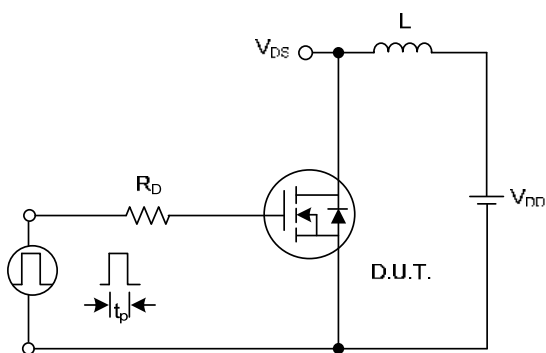
Switching Waveforms



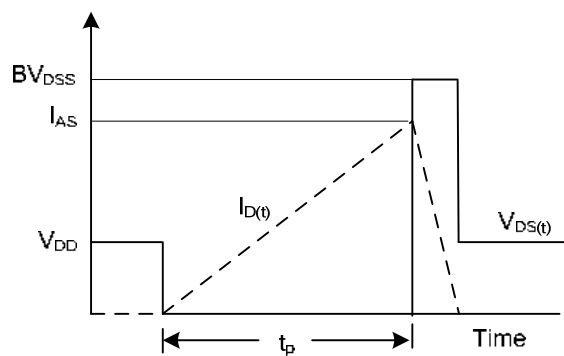
Gate Charge Test Circuit



Gate Charge Waveform

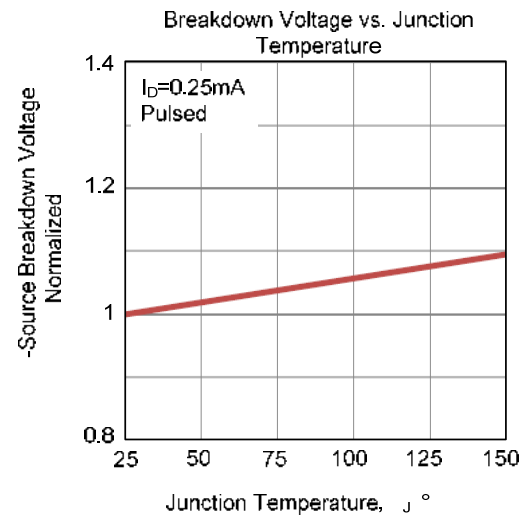
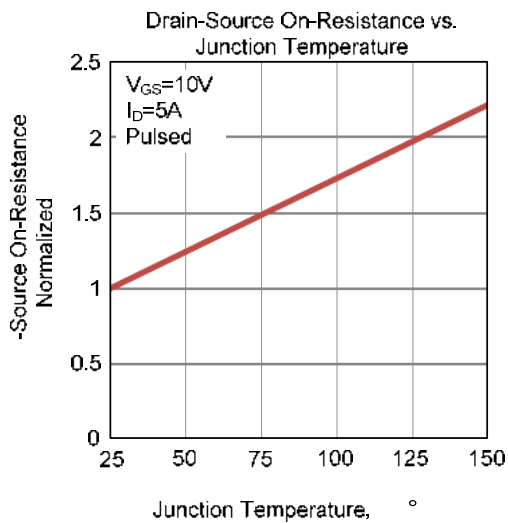
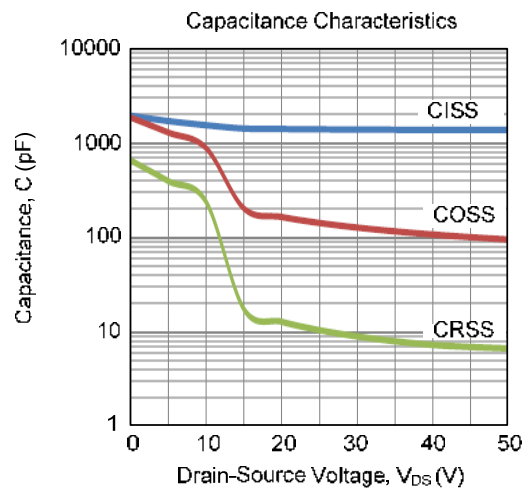
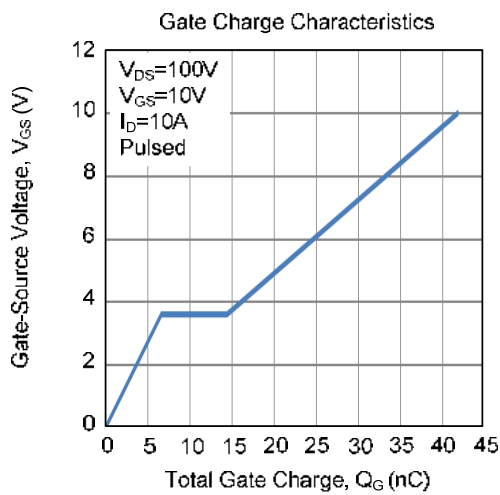
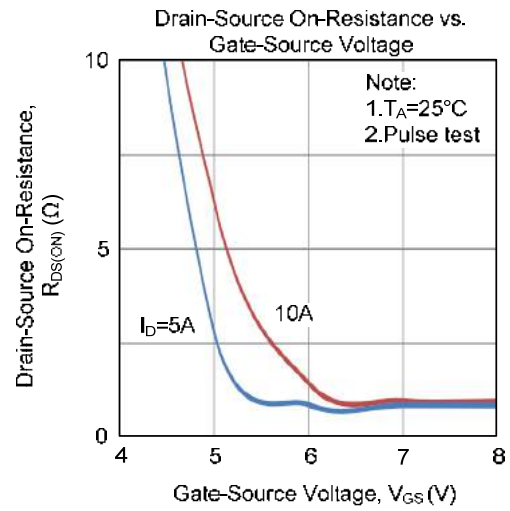
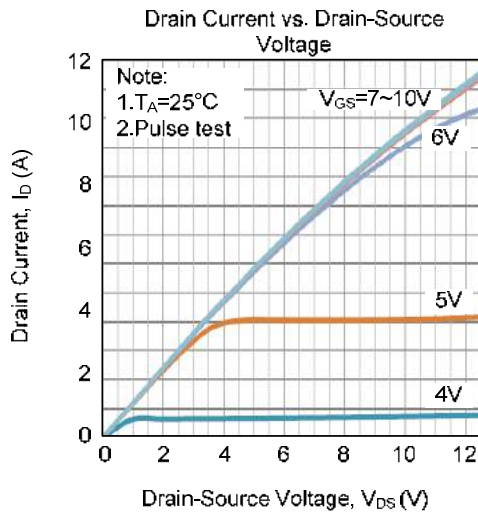


Unclamped Inductive Switching Test Circuit

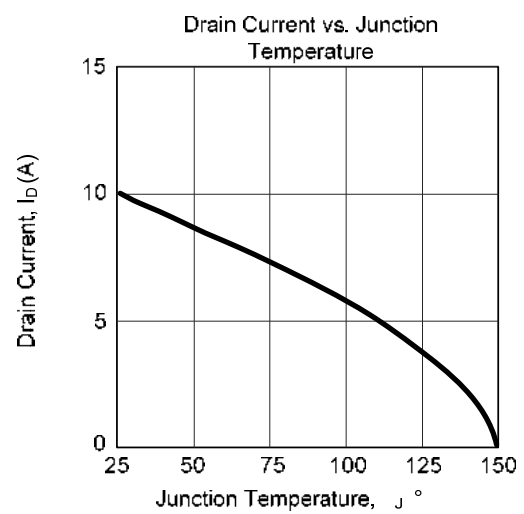
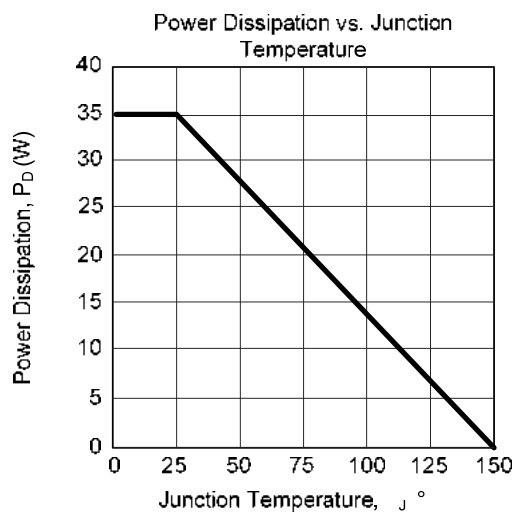
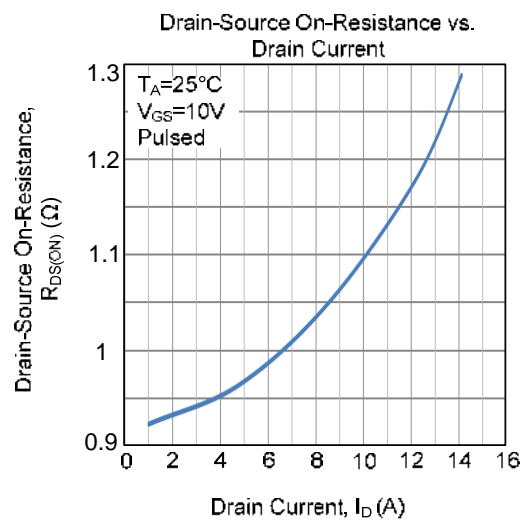
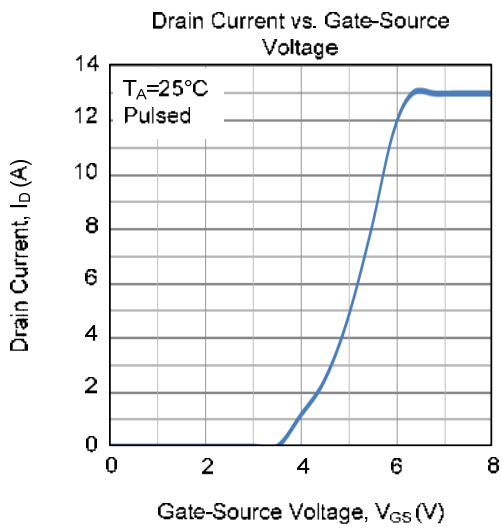
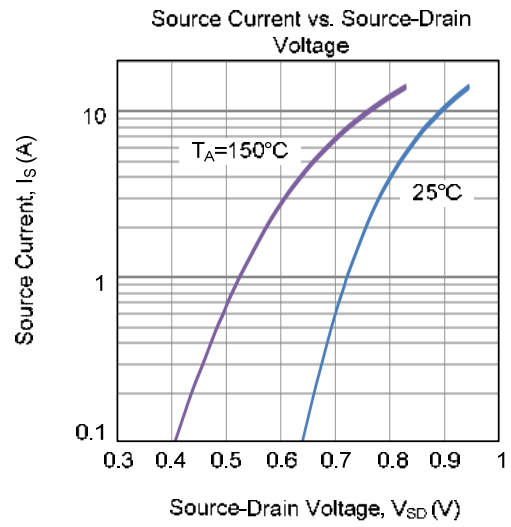
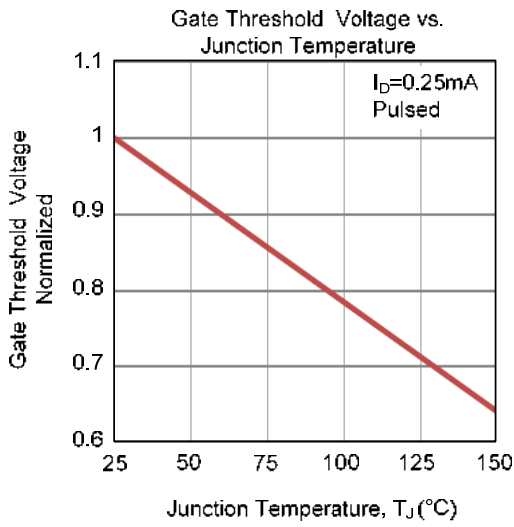


Unclamped Inductive Switching Waveforms

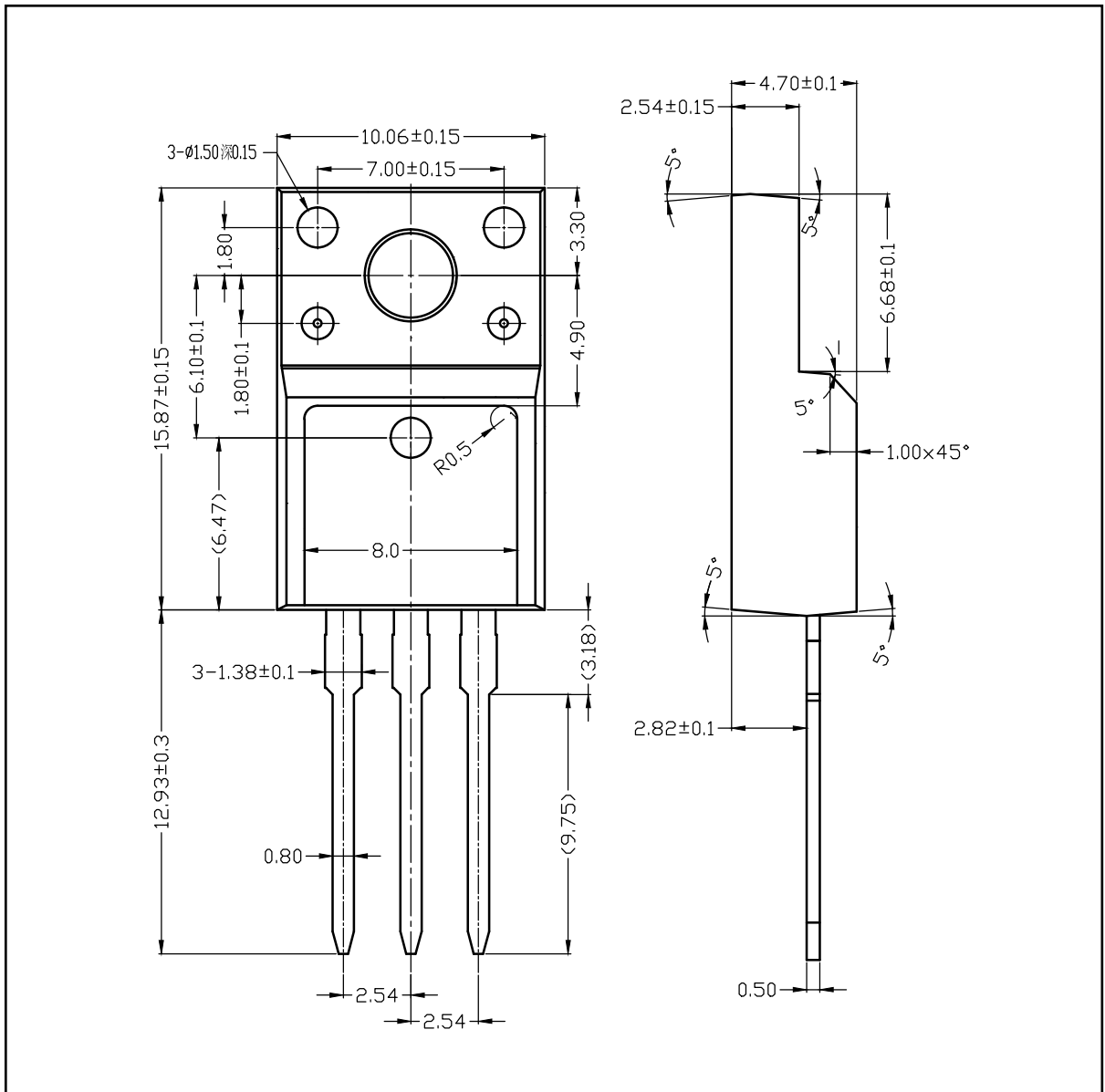
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

