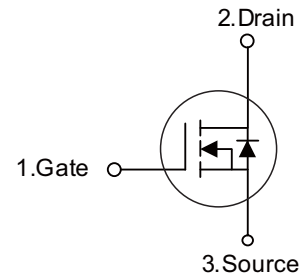


■ PRODUCT CHARACTERISTICS

VDSS	650V
$R_{DS(on)Typ}(V_{GS} = 10V)$	2.4Ω
Qg@type	15nC
ID	4A

Symbol



■ APPLICATIONS

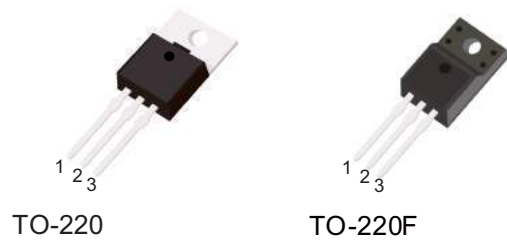
- Electronic ballast
- Electronic transformer
- Switch mode power supply

■ FEATURES

- * Low on-resistance
- * High input resistance
- * Rohs compliant

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4N65F	TO-220F	50 pieces/Tube
N/A	MOT4N65A	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}	650	V
Gate-Source Voltage	V_{GSS}	±30	V
Avalanche Current (Note 2)	I_{AR}	4.0	A
Drain Current	Continuous	I_D	4.0
	Pulsed (Note 2)	I_{DM}	16
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	260
	Repetitive (Note 2)	E_{AR}	10.6
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	P_D	106
	TO-22F		36
Junction Temperature	T_J	+150	°C
Operating Temperature	T_{OPR}	-55 ~ +150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Note: 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. $L = 30\text{mH}$, $I_{AS} = 4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

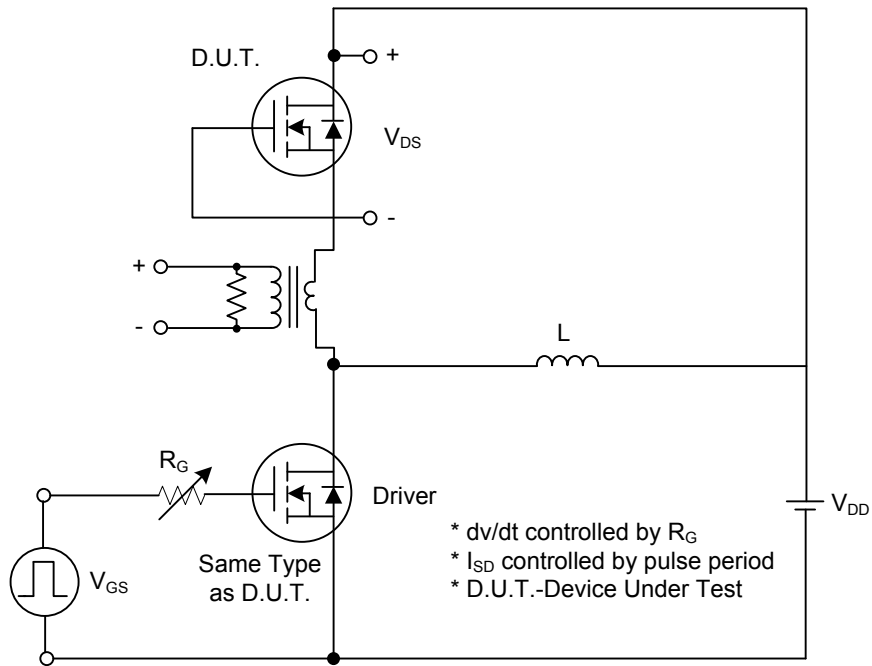
4. $I_{SD} \leq 4.4\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise noted)

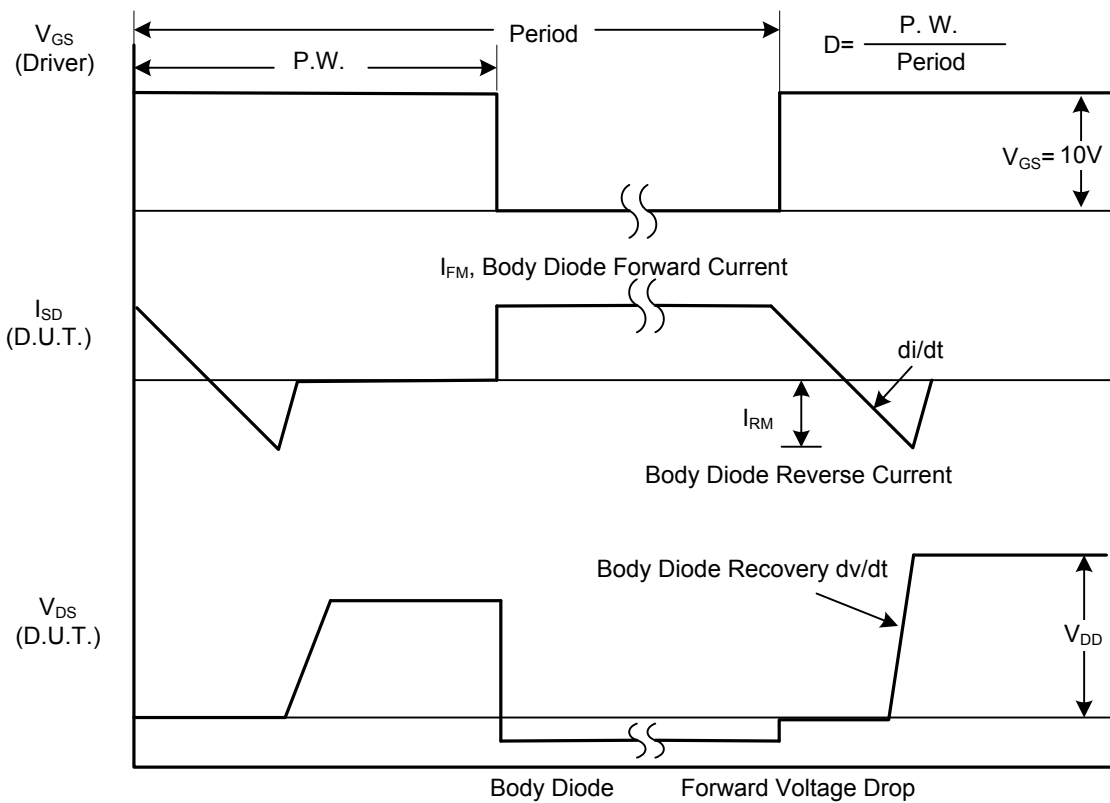
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250μA	650	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 650 V, V _{GS} = 0 V	-	-	10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	-	-	100	nA
	Reverse				V _{GS} = 30 V, V _{DS} = 0 V	-100
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C	-	0.6	-	V/°C
On characteristics						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	-	4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10 V, I _D = 2A	-	2.4	2.8	Ω
Dynamic characteristics						
Input Capacitance	C _{ISS}	V _{DS} = 25 V, V _{GS} = 0V, f = 1MHz	-	520	-	pF
Output Capacitance	C _{OSS}		-	70	-	pF
Reverse Transfer Capacitance	C _{RSS}		-	8	-	pF
Switching characteristics						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 325V, I _D = 4.0A, R _G = 25Ω (Note 1, 2)	-	13	-	ns
Turn-On Rise Time	t _R		-	45	-	ns
Turn-Off Delay Time	t _{D(OFF)}		-	25	-	ns
Turn-Off Fall Time	t _F		-	35	-	ns
Total Gate Charge	Q _G	V _{DS} = 520V, I _D = 4A V _{GS} = 10V (Note 1, 2)	-	15	-	nC
Gate-Source Charge	Q _{GS}		-	3.4	-	nC
Gate-Drain Charge	Q _{GD}		-	7.1	-	nC
Source-drain diode ratings and characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 4.0A	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I _S		-	-	4.4	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		-	-	17.6	A
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = 4.0A,	-	250	-	ns
Reverse Recovery Charge	Q _{RR}	dI _F /dt = 100 A/μs (Note 1)	-	1.5	-	μC

Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
 2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

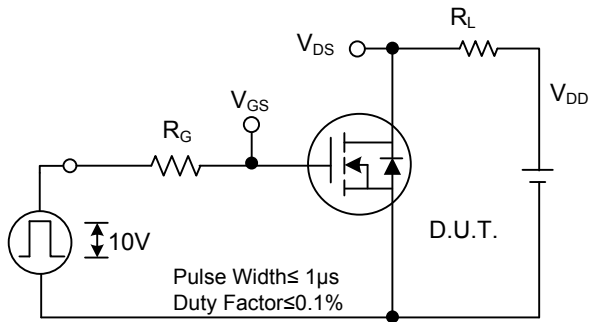


Peak Diode Recovery dv/dt Test Circuit

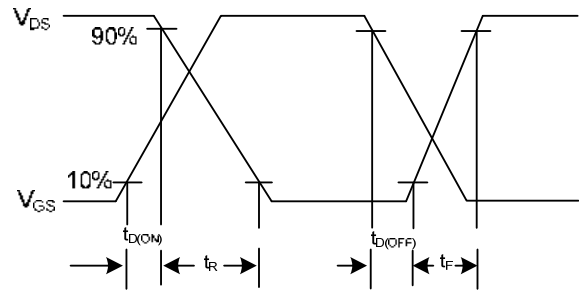


Peak Diode Recovery dv/dt Waveforms

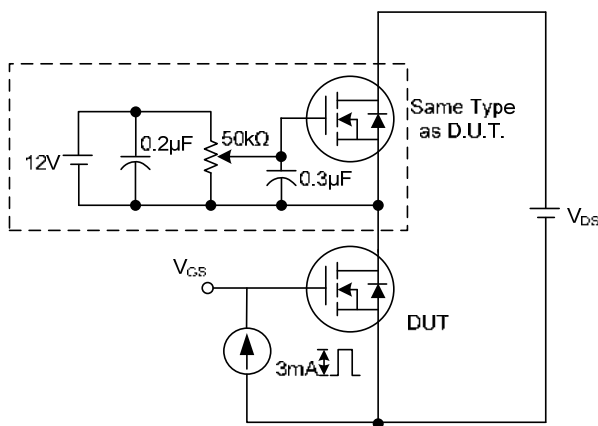
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



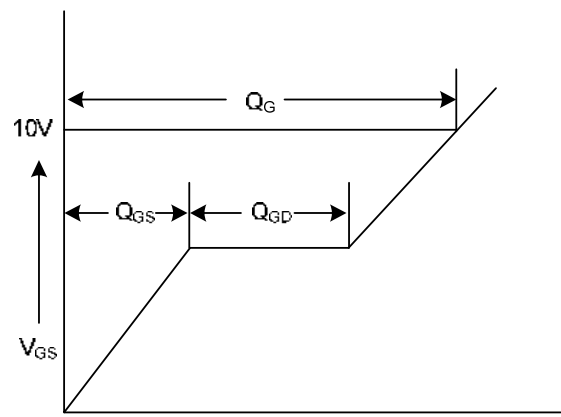
Switching Test Circuit



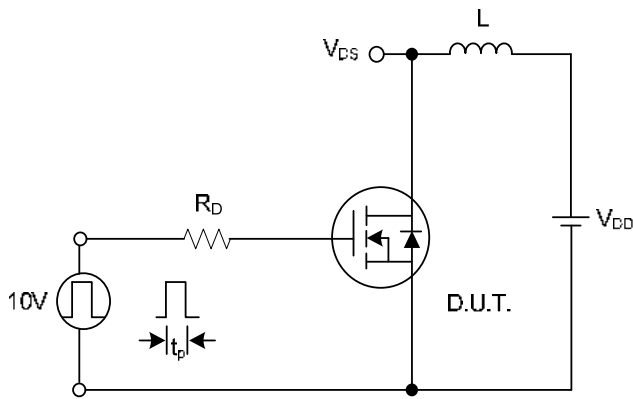
Switching Waveforms



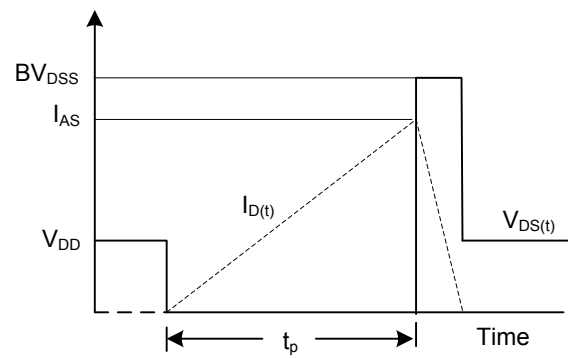
Gate Charge Test Circuit



Charge Gate Charge Waveform

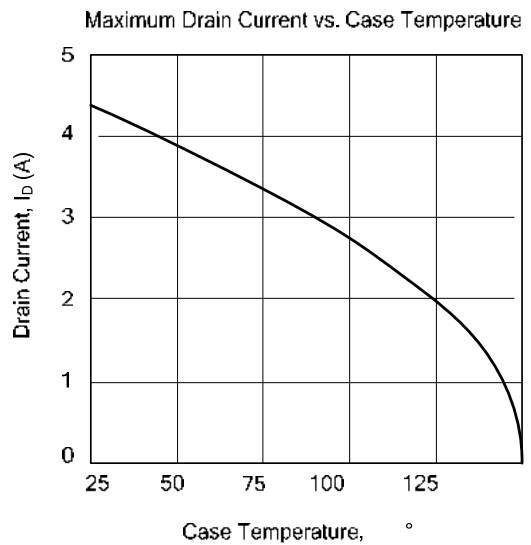
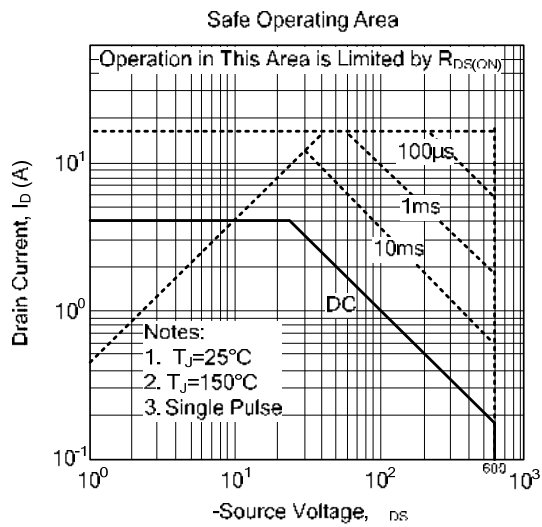
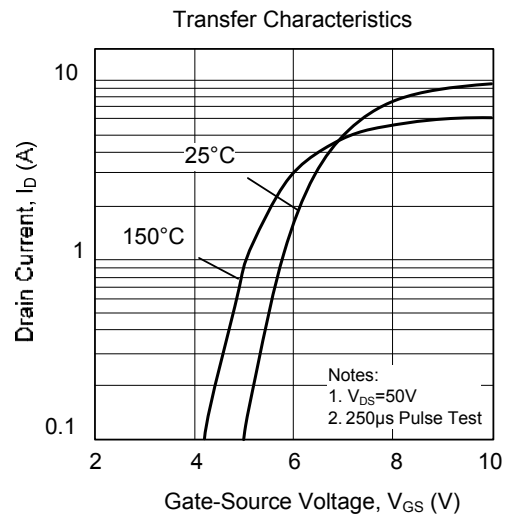
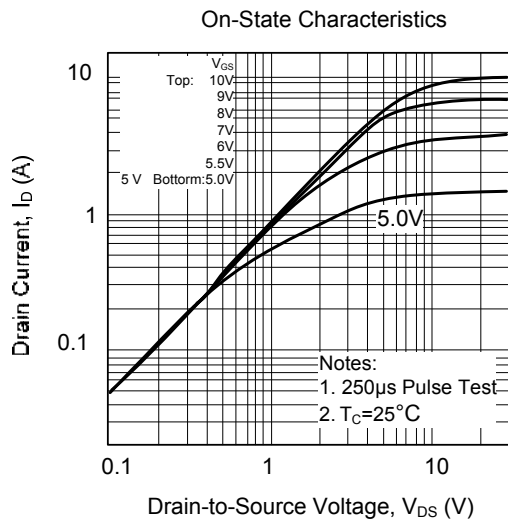
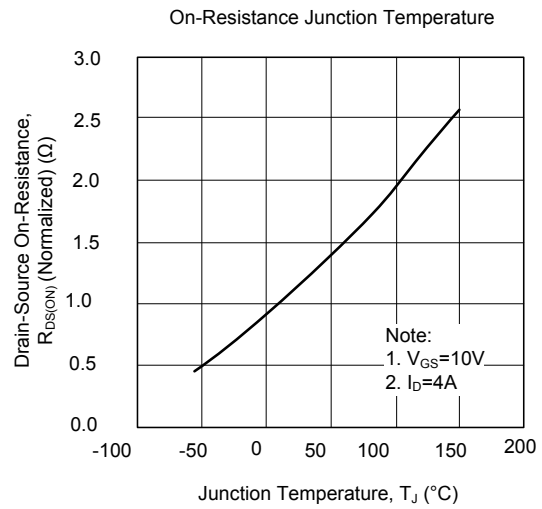
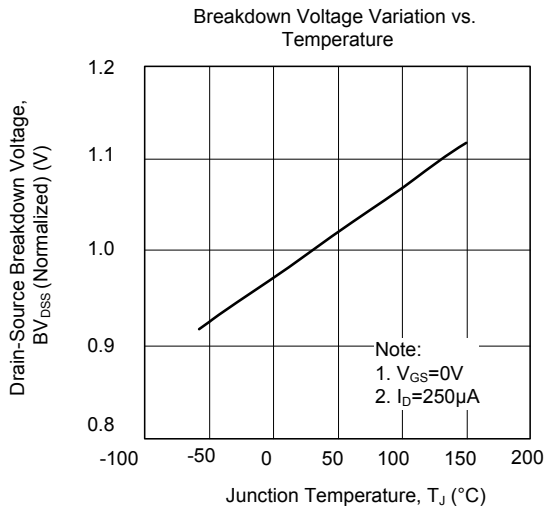


Unclamped Inductive Switching Test Circuit

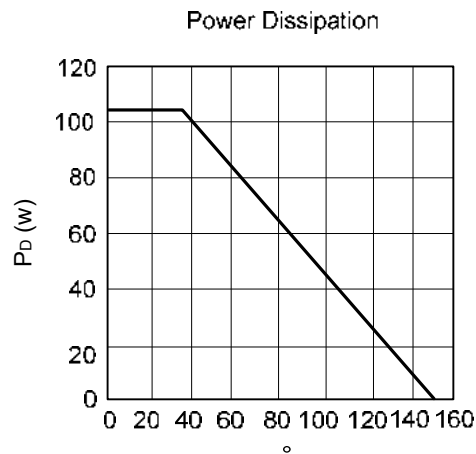
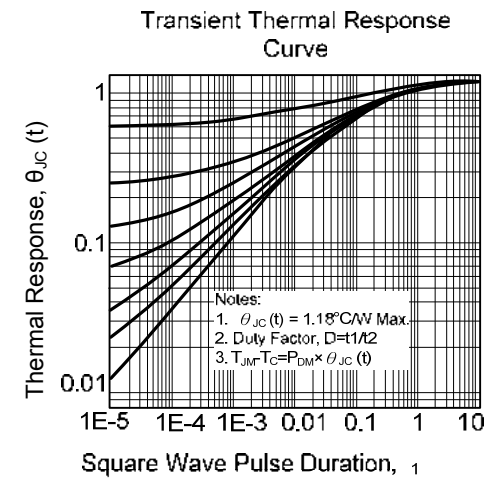
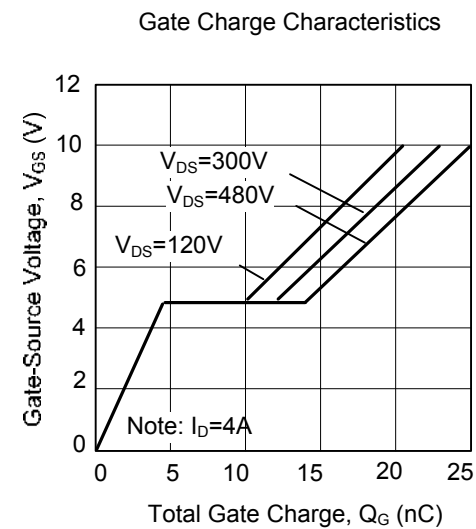
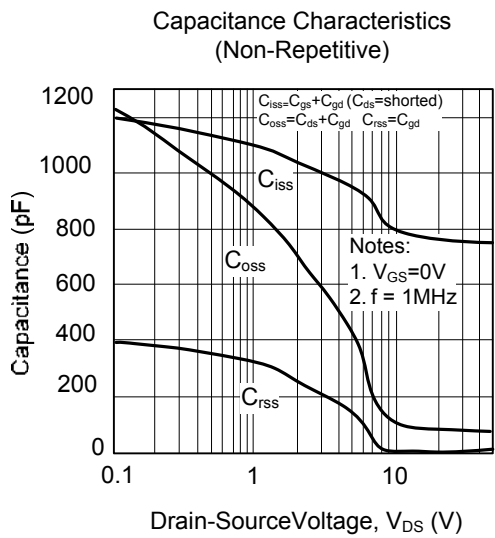
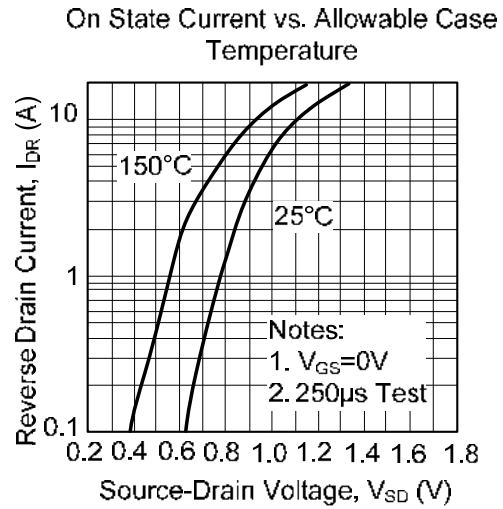
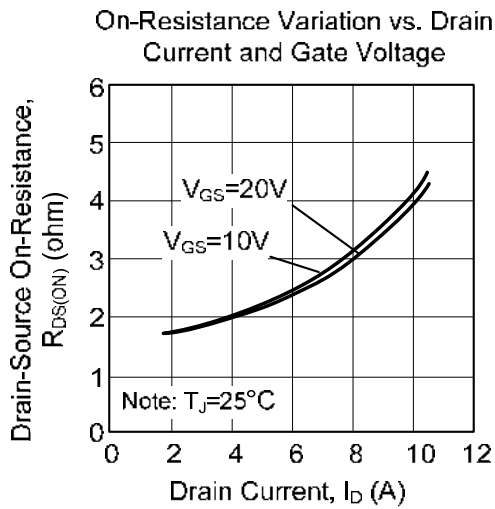


Unclamped Inductive Switching Waveforms

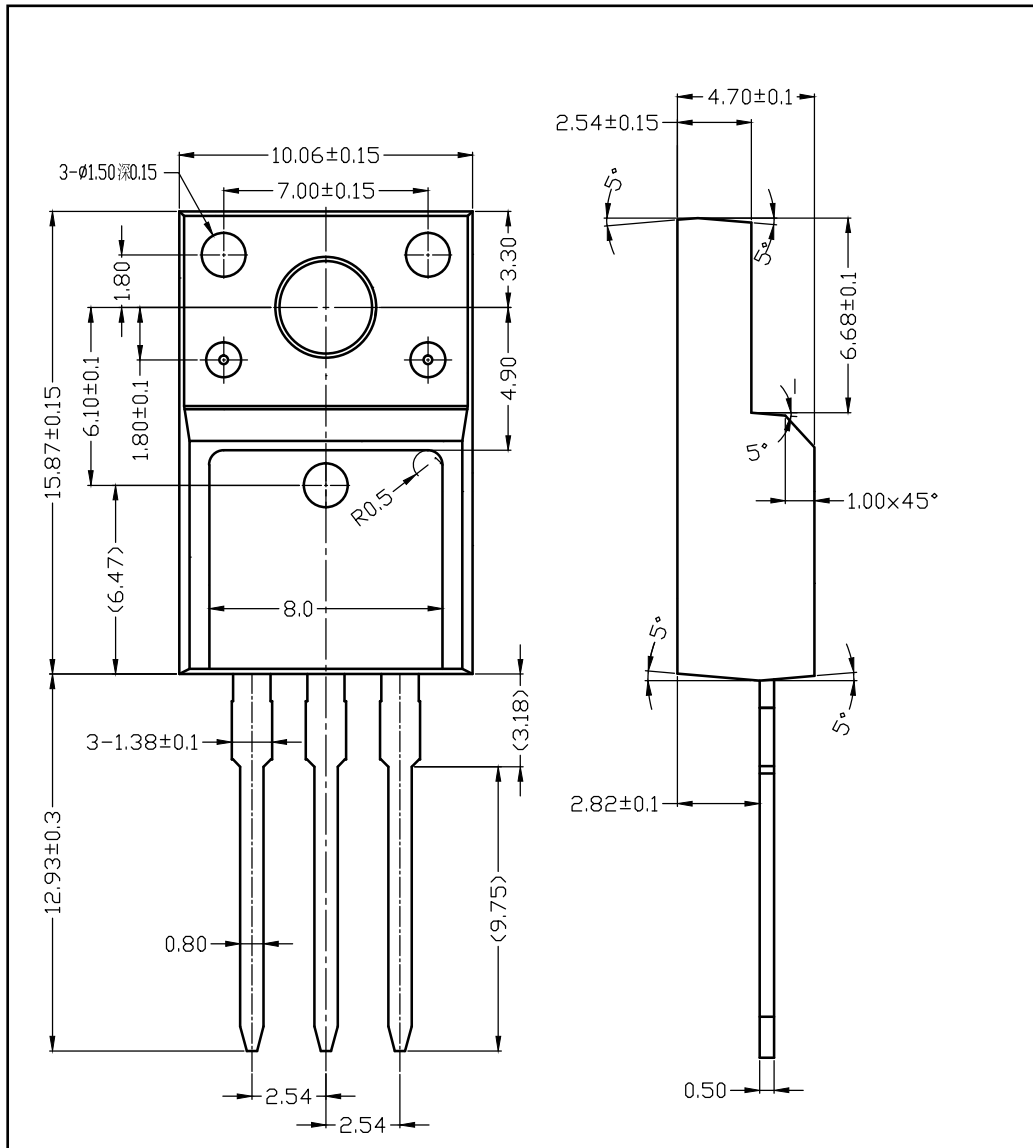
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

