

■ PRODUCT CHARACTERISTICS

VDSS	600V
$R_{DS(on)typ.}(V_{GS}=10V)$	1Ω
Qg@type	28nC
ID	8A

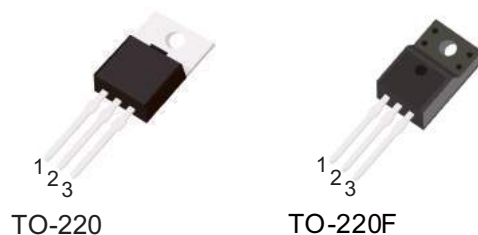
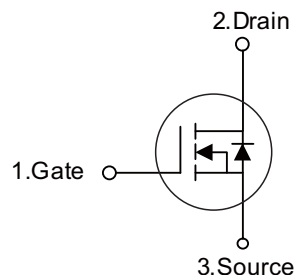
■ APPLICATIONS

- * High frequency switching mode power supply
- * Electronic ballast
- * LED power supply

■ FEATURES

- * Ultra low gate charge
- * Low reverse transfer capacitance
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

Symbol



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT8N60F	TO-220F	50 pieces/Tube
N/A	MOT8N60A	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}	600	V
Gate-Source Voltage		V_{GSS}	±30	V
Avalanche Current (Note 2)		I_{AR}	8	A
Drain Current	Continuous	I_D	8	A
	Pulsed (Note 2)	I_{DM}	32	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	230	mJ
	Repetitive (Note 2)	E_{AR}	14.7	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation	TO-220	P_D	147	W
	TO-220F		48	W
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OPR}	-55 ~ +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 T_J

3. $L = 7.1\text{mH}$, $I_{AS} = 8\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

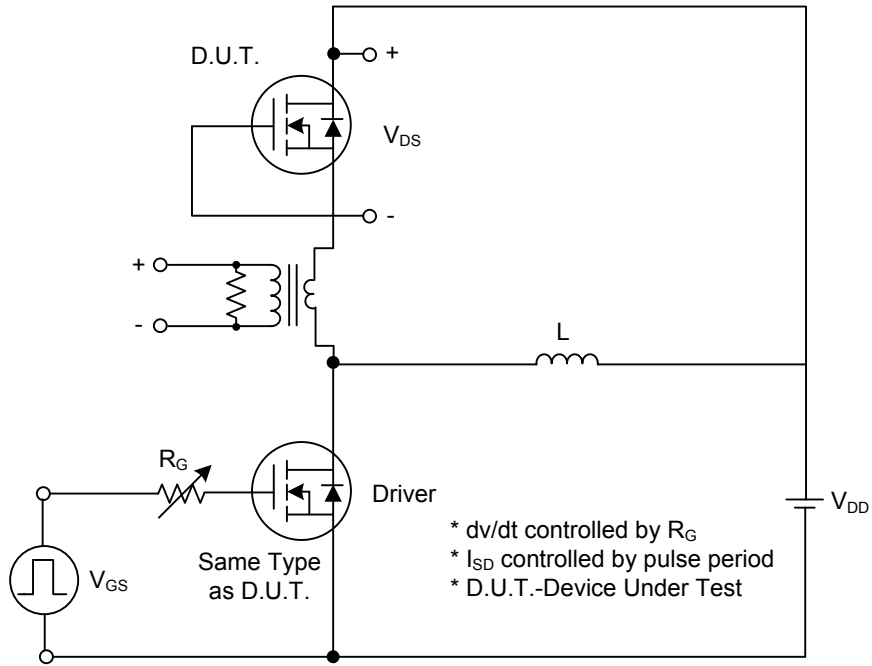
4. $I_{SD} \leq 7.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

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

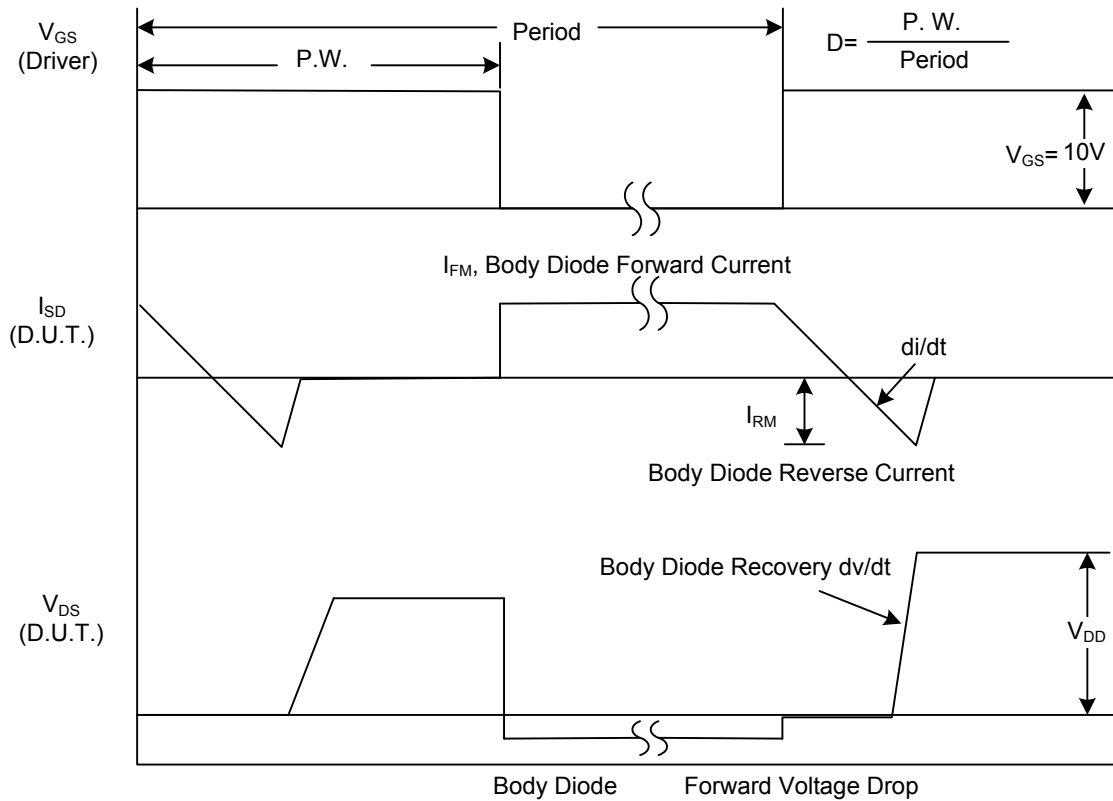
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0 V, I _D = 250 μA	600	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 600 V, V _{GS} = 0V	-	-	10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30 V, V _{DS} = 0V	-	-	100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0V	-	-	-100	nA
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C	-	0.7	-	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} = 10V, I _D = 4A	-	1.0	1.2	Ω
Dynamic characteristics							
Input Capacitance		C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz	-	965	-	pF
Output Capacitance		C _{OSS}		-	105	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	12	-	pF
Switching characteristics							
Turn-On Delay Time		t _{D(ON)}	V _{DD} = 300V, I _D = 8A, R _G = 25Ω (Note 1, 2)	-	16.5	-	ns
Turn-On Rise Time		t _R		-	60.5	-	ns
Turn-Off Delay Time		t _{D(OFF)}		-	81	-	ns
Turn-Off Fall Time		t _F		-	64.5	-	ns
Total Gate Charge		Q _G	V _{DS} = 480V,I _D =8A, V _{GS} = 10V (Note 1, 2)	-	36	-	nC
Gate-Source Charge		Q _{GS}		-	4.5	-	nC
Gate-Drain Charge		Q _{GD}		-	12	-	nC
Drain-source diode characteristics and maximum ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} = 0V, I _S = 8A	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I _S		-	-	8	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}		-	-	32	A
Reverse Recovery Time		t _{rr}	V _{GS} = 0V, I _S = 8A,	-	365	-	ns
Reverse Recovery Charge		Q _{RR}	dl _F /dt = 100 A/μs (Note 2)	-	3.4	-	μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

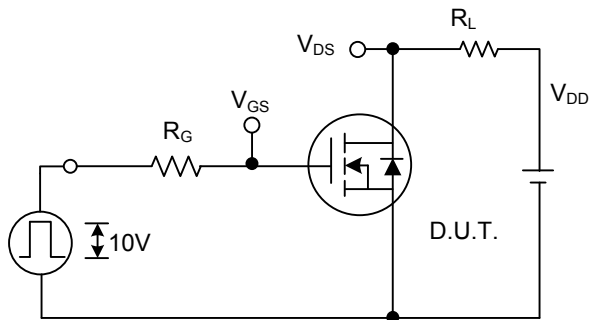


Peak Diode Recovery dv/dt Test Circuit

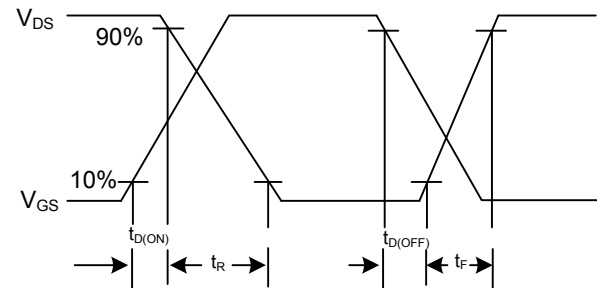


Peak Diode Recovery dv/dt Waveforms

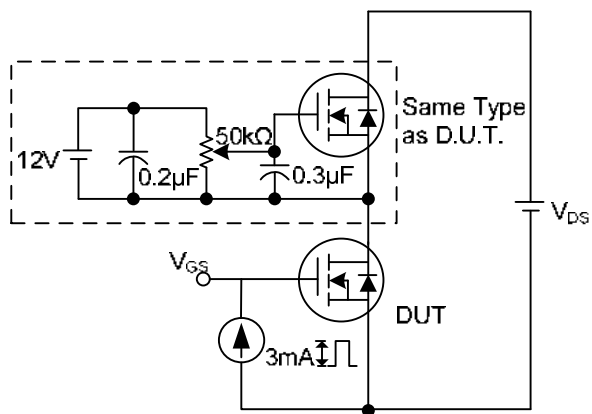
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



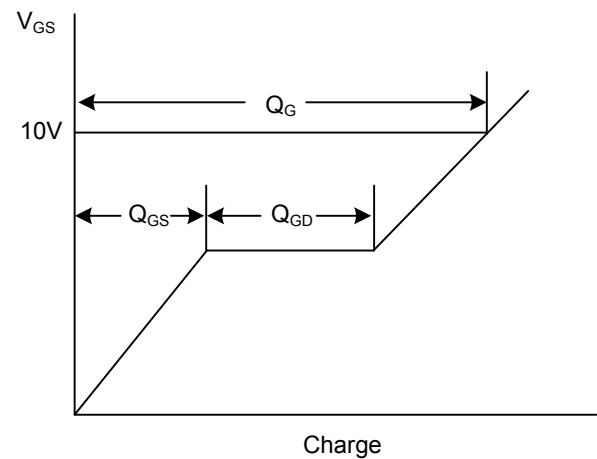
Switching Test Circuit



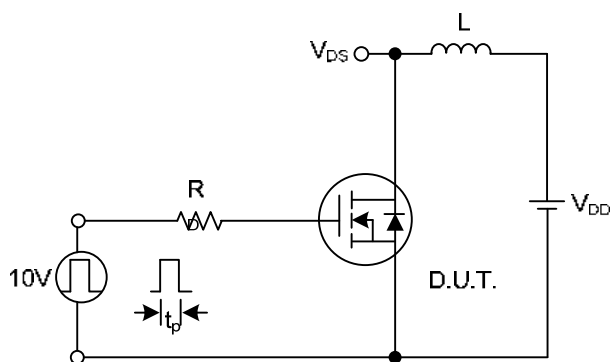
Switching Waveforms



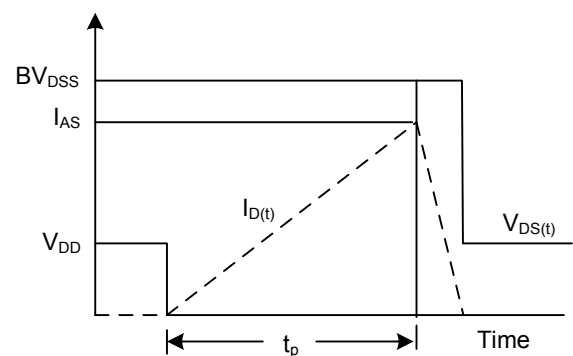
Gate Charge Test Circuit



Gate Charge Waveform

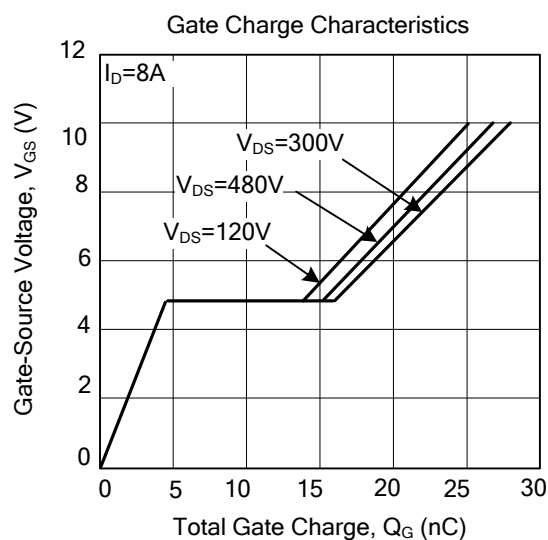
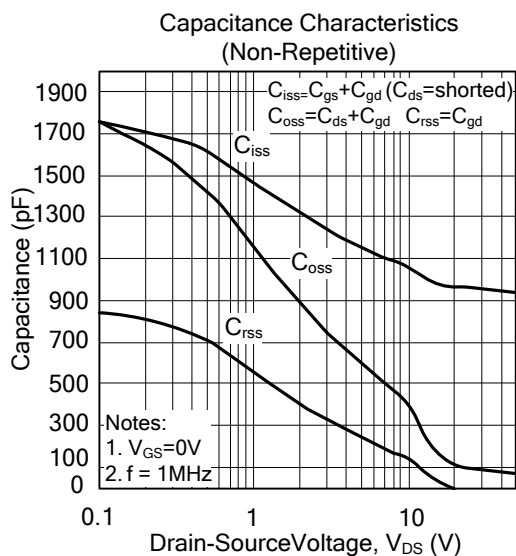
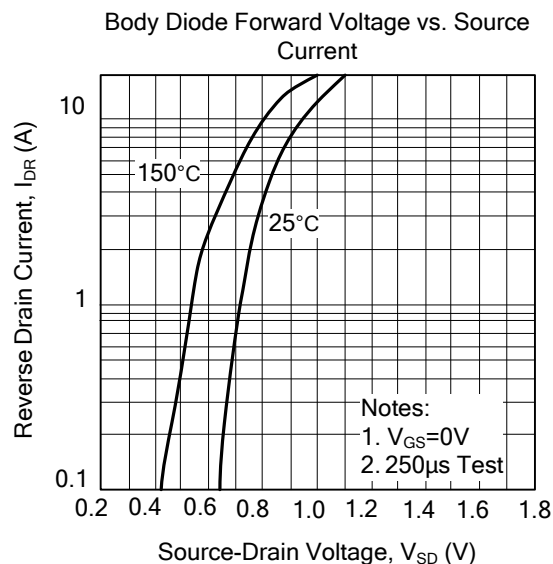
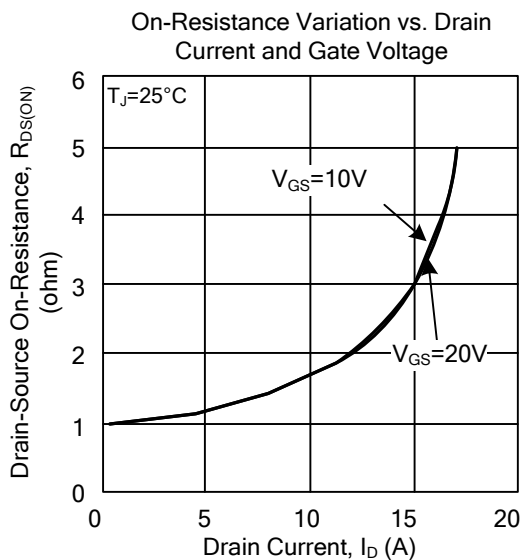
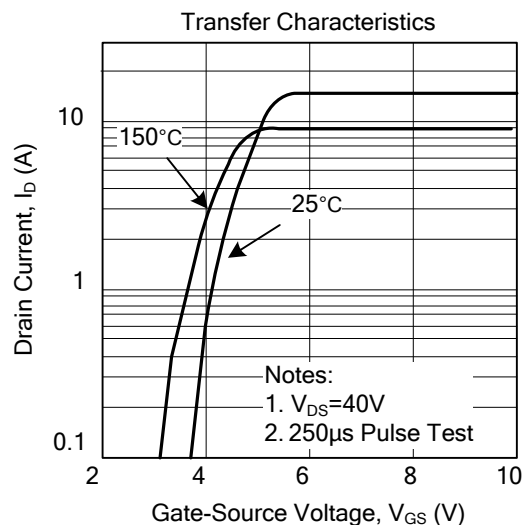
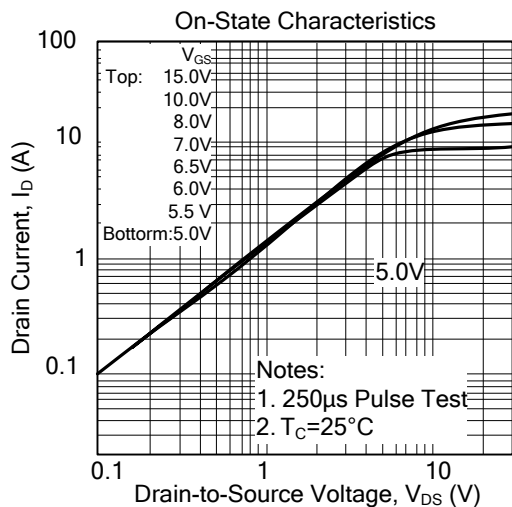


Unclamped Inductive Switching Test Circuit

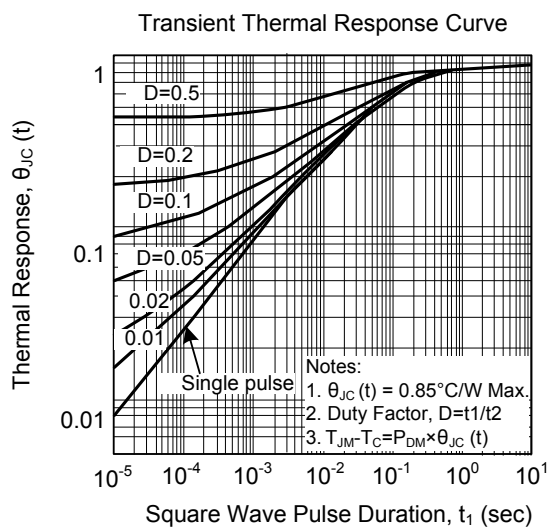
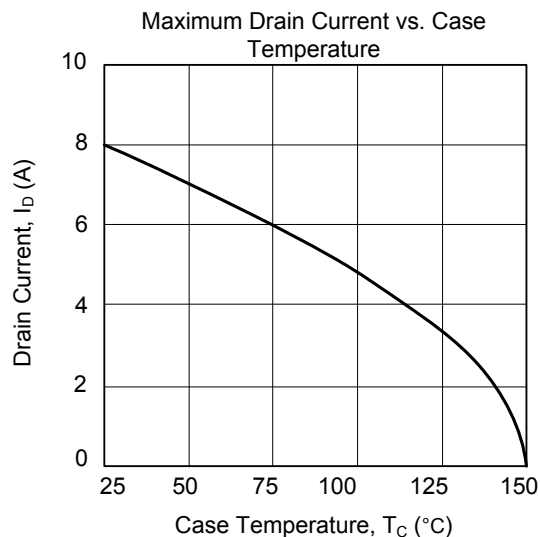
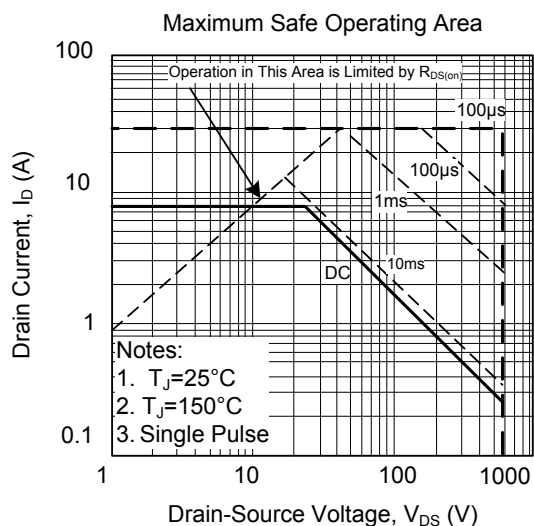
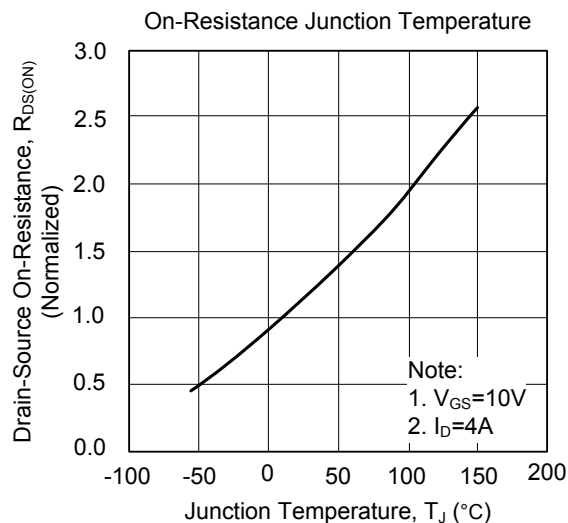
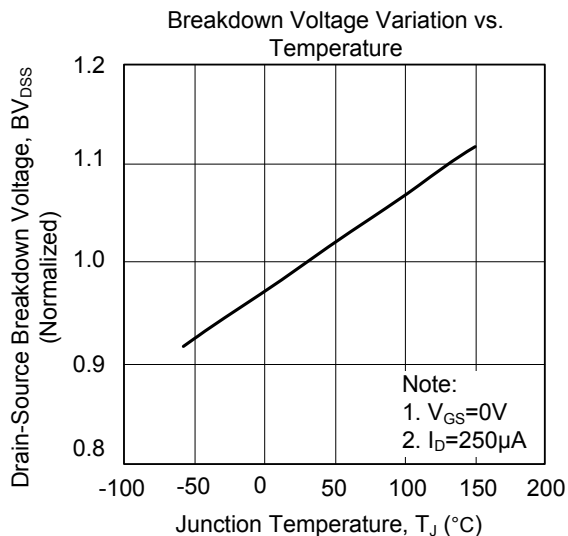


Unclamped Inductive Switching Waveforms

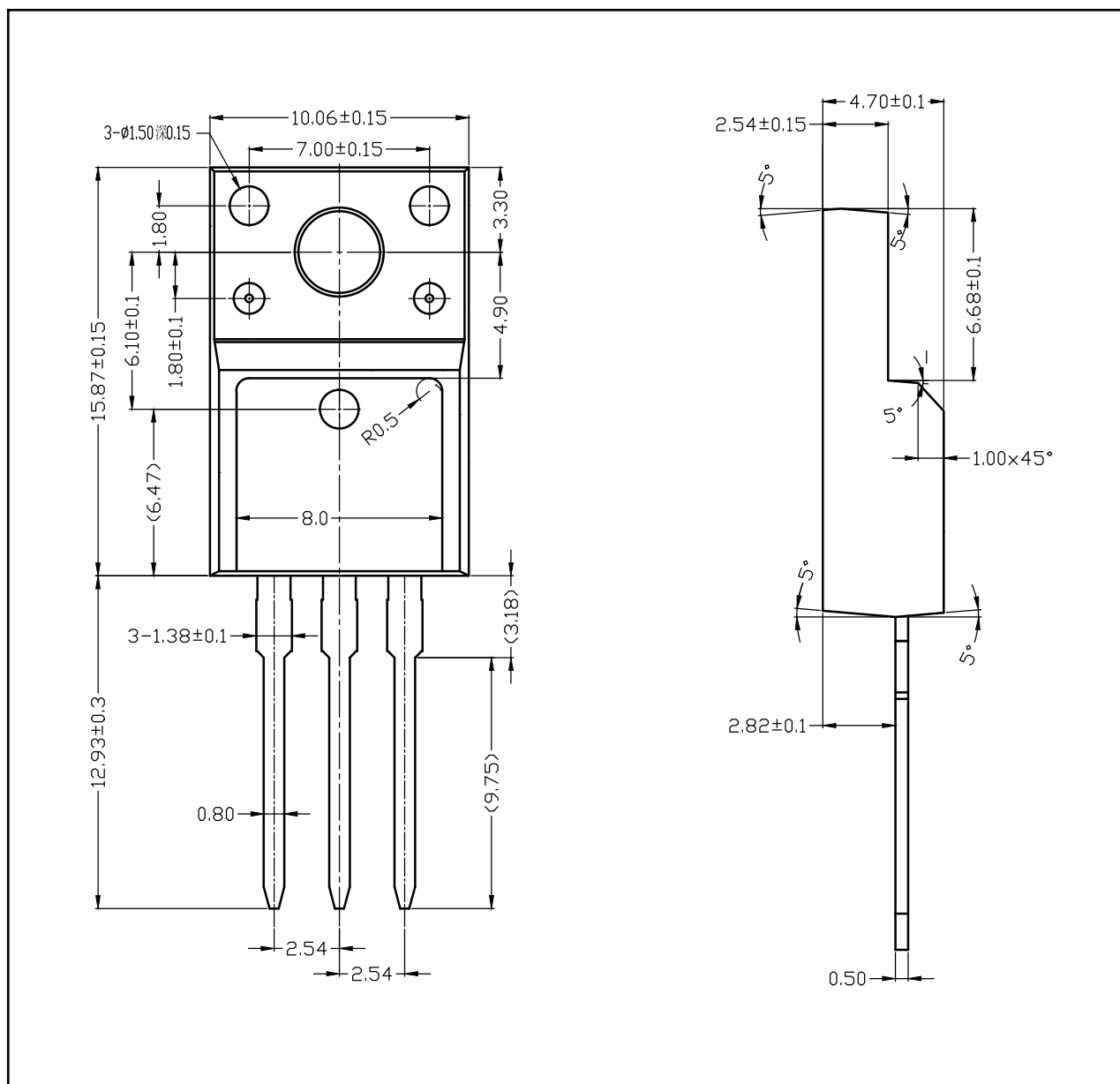
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

