

■ PRODUCT CHARACTERISTICS

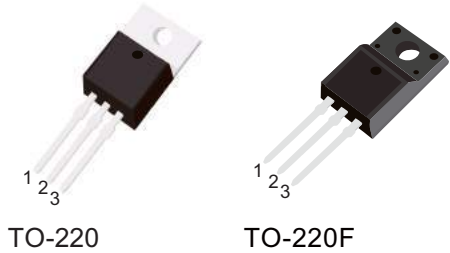
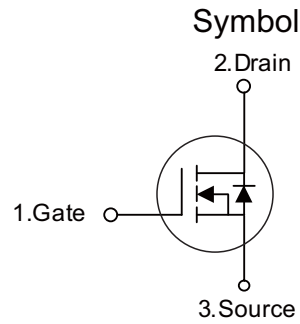
VDSS	650V
R <sub>DS(on)</sub> Typ(@V <sub>GS</sub> =10V)	0.99Ω
Qg@type	28nC
ID	8A

■ APPLICATIONS

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- LED power supplies

■ FEATURES

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



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT8N65MF	TO-220F	50 pieces/Tube
N/A	MOT8N65MA	TO-220	50 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	650	V
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Avalanche Current	I <sub>AR</sub>	8	A
Drain Current	Continuous	I <sub>D</sub>	8
	Pulsed (Note 2)	I <sub>DM</sub>	32
Avalanche Energy	Single Pulsed (Note 3)	E <sub>AS</sub>	230
	Repetitive (Note 2)	E <sub>AR</sub>	14.7
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	P <sub>D</sub>	147
	TO-220F		48
Junction Temperature	T <sub>J</sub>	+150	°C
Operating Temperature	T <sub>OPR</sub>	-55 ~ +150	°C
Storage Temperature	T <sub>STG</sub>	-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.

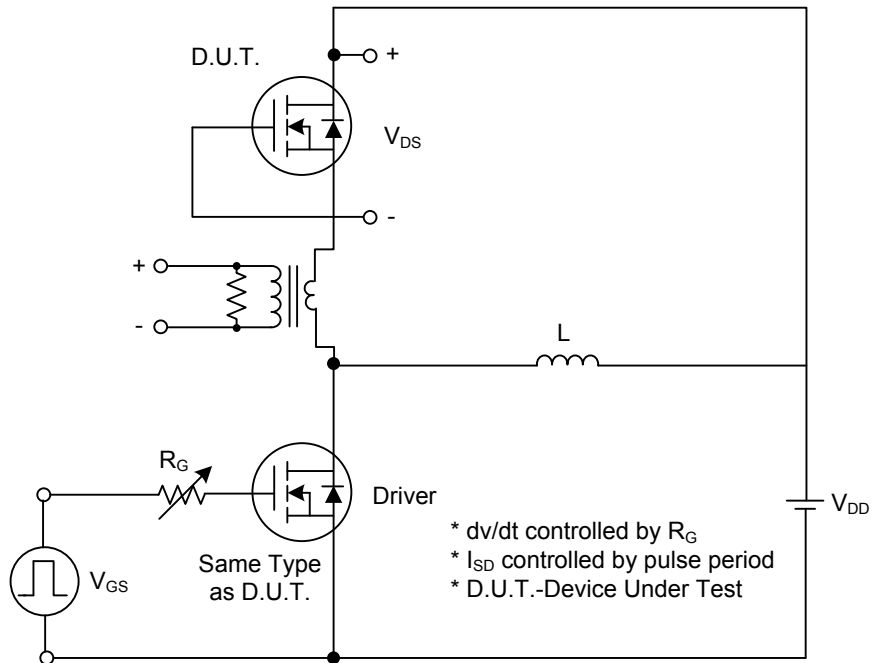
2. Repetitive Rating : Pulse width limited by T<sub>J</sub>
3. L = 7.1mH, I<sub>AS</sub> = 8A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25 Ω, Starting T<sub>J</sub> = 25°C
4. I<sub>SD</sub> ≤ 8A, di/dt ≤ 200A/μs, V<sub>DD</sub> ≤ BV<sub>DSS</sub>, Starting T<sub>J</sub> = 25°C

**■ ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25°C, unless otherwise noted)**

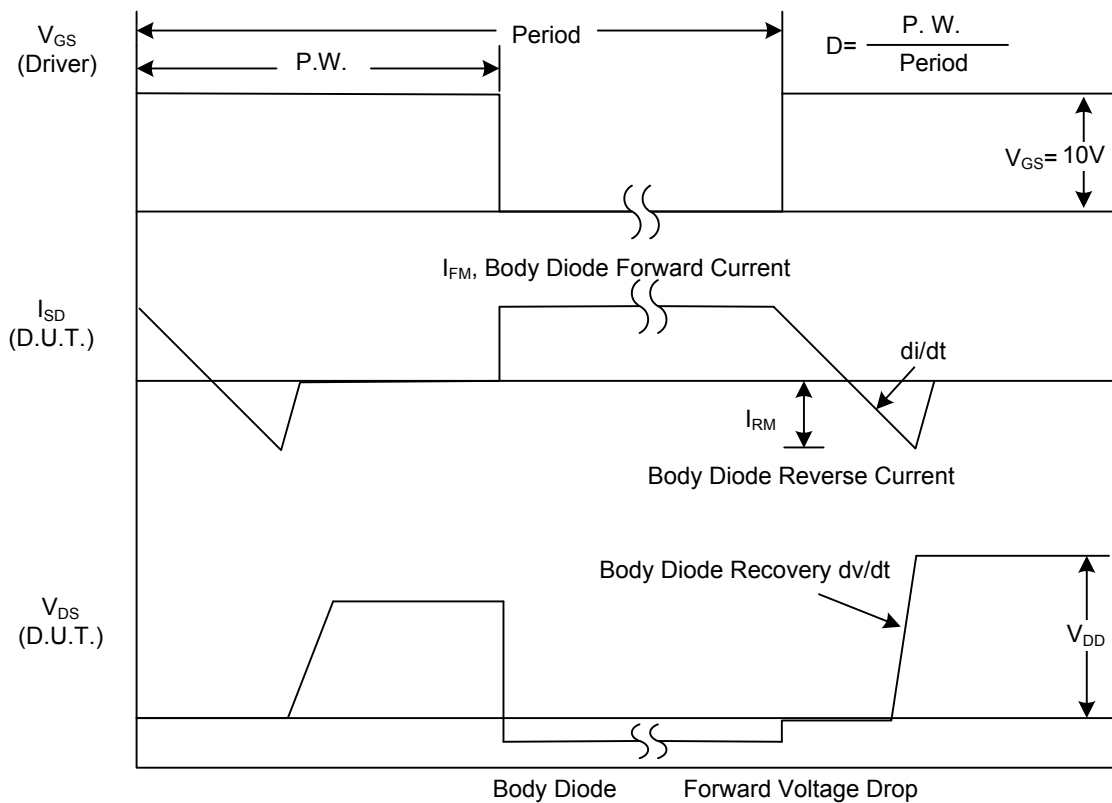
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	650	-	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 650 V, V <sub>GS</sub> = 0 V	-	-	10	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	-	-	100	nA
	Reverse				-100	nA
Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	I <sub>D</sub> = 250 μA, Referenced to 25°C	-	0.7		V/°C
On characteristics						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2.0	-	4.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 4 A	-	0.99	1.2	Ω
Dynamic characteristics						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, f = 1 MHz	-	965	-	pF
Output Capacitance	C <sub>OSS</sub>		-	105	-	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	12	-	pF
Switching characteristics						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = 325V, I <sub>D</sub> = 8A, R <sub>G</sub> = 25Ω (Note 1, 2)	-	16.5	-	ns
Turn-On Rise Time	t <sub>R</sub>		-	60.5	-	ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>		-	81	-	ns
Turn-Off Fall Time	t <sub>F</sub>		-	64.5	-	ns
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> = 520V, I <sub>D</sub> = 8A, V <sub>GS</sub> = 10 V (Note 1, 2)	-	28	-	nC
Gate-Source Charge	Q <sub>GS</sub>		-	4.5	-	nC
Gate-Drain Charge	Q <sub>GD</sub>		-	12	-	nC
Drain-source diode characteristics and maximum ratings						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 8A	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>		-	-	8	A
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>		-	-	32	A
Reverse Recovery Time	t <sub>RR</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 8A,	-	365	-	ns
Reverse Recovery Charge	Q <sub>RR</sub>	di <sub>F</sub> /dt = 100 A/μs (Note 2)	-	3.4	-	μC

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

■ TEST CIRCUITS AND WAVEFORMS

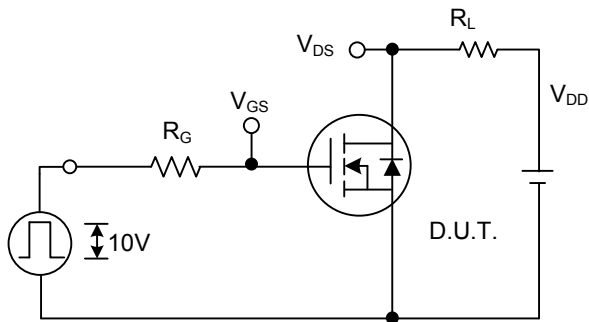


Peak Diode Recovery  $dv/dt$  Test Circuit

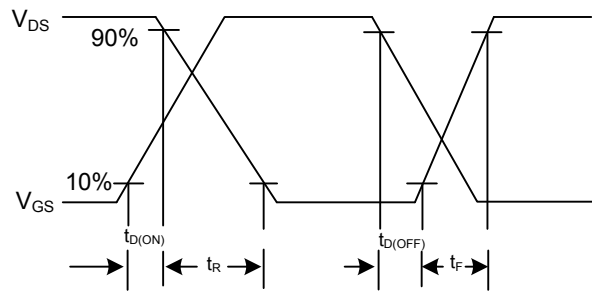


Peak Diode Recovery  $dv/dt$  Waveforms

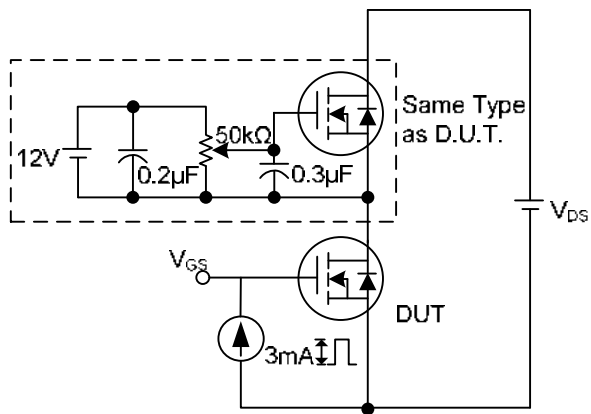
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



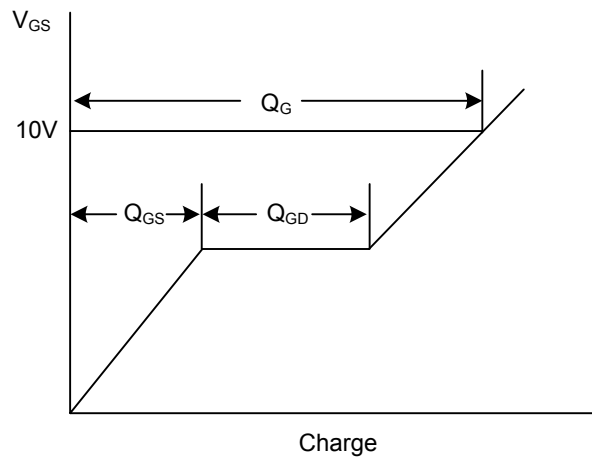
Switching Test Circuit



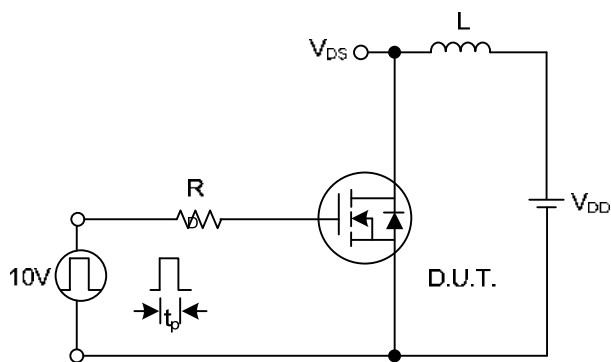
Switching Waveforms



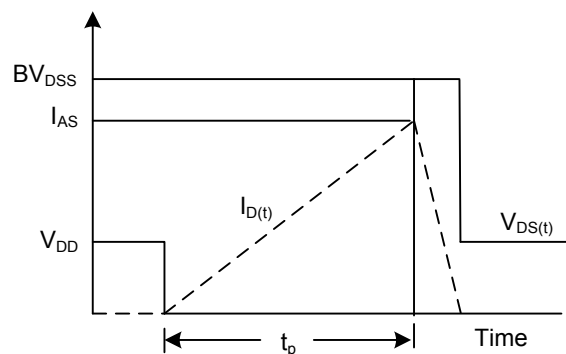
Gate Charge Test Circuit



Gate Charge Waveform

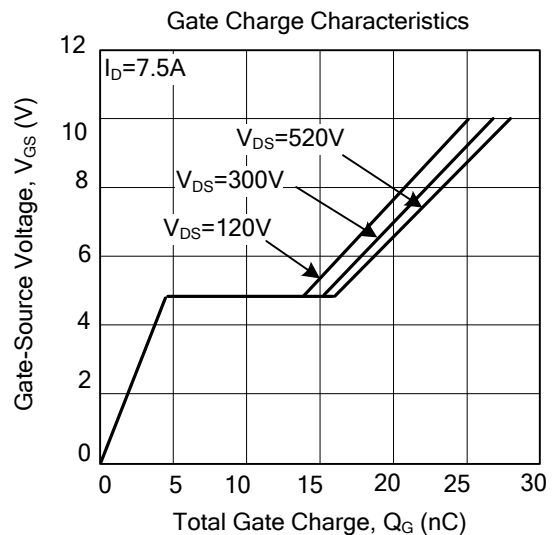
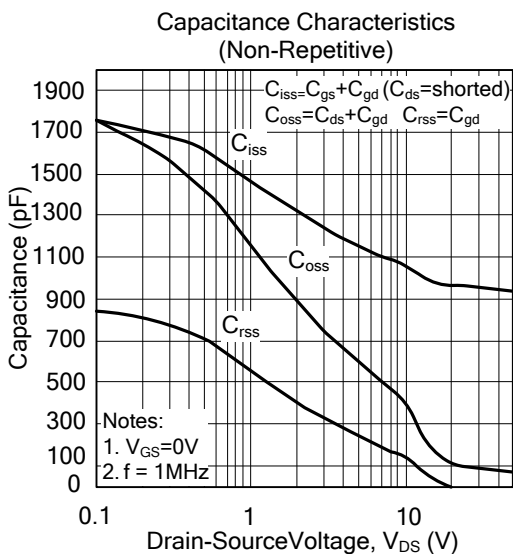
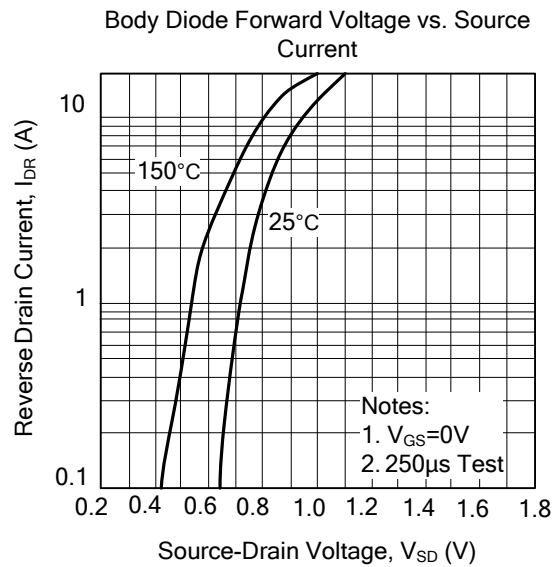
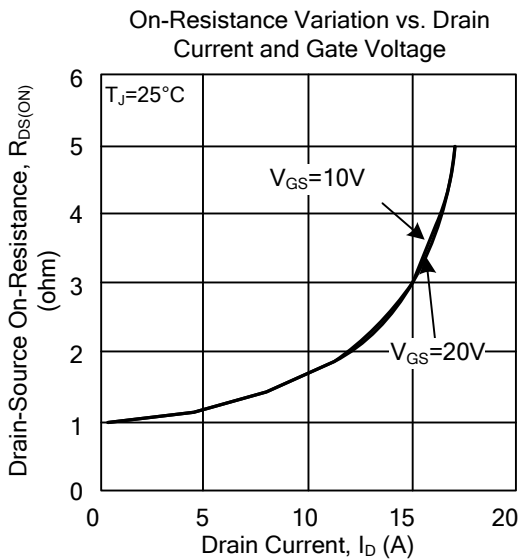
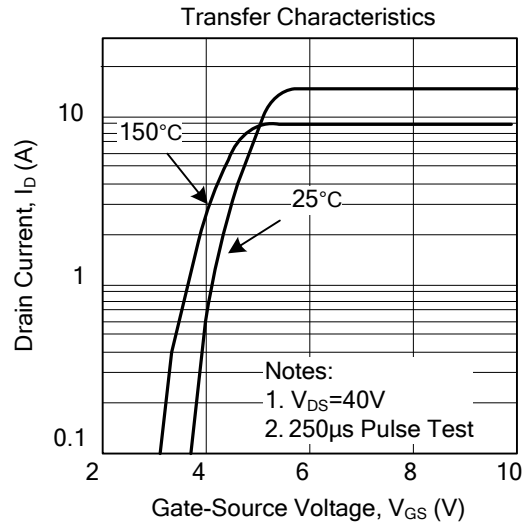
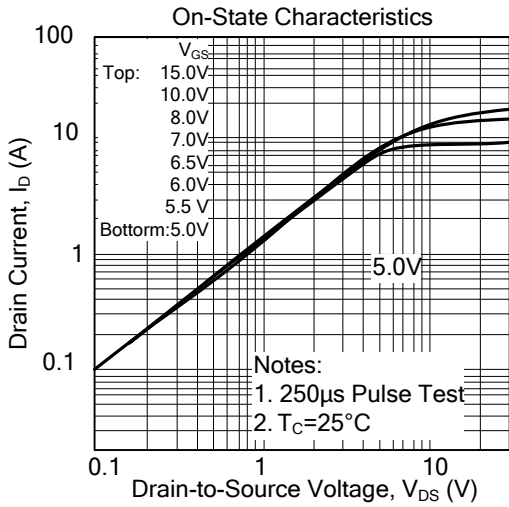


Unclamped Inductive Switching Test Circuit

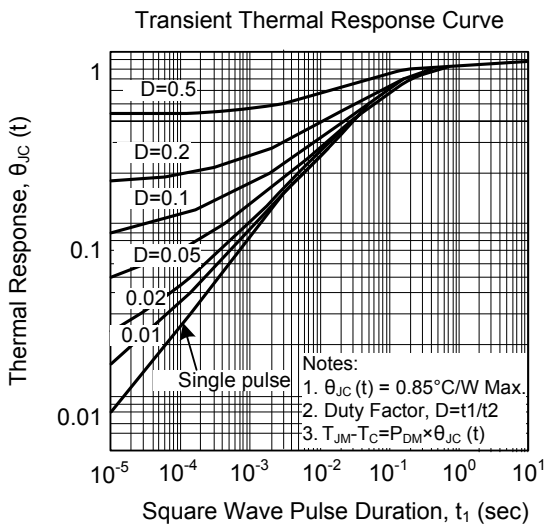
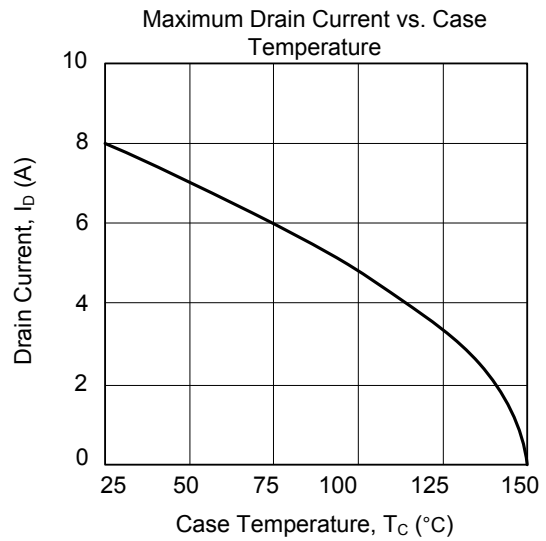
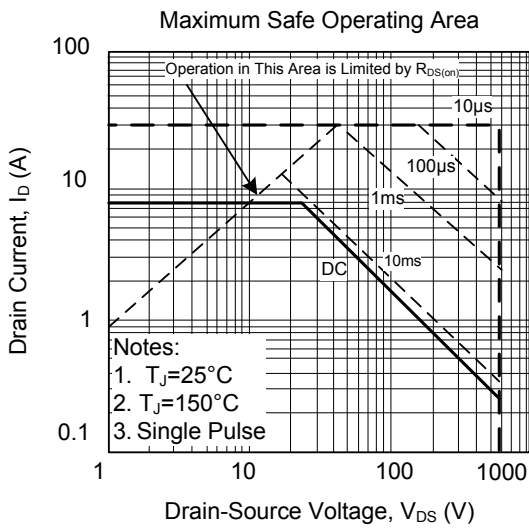
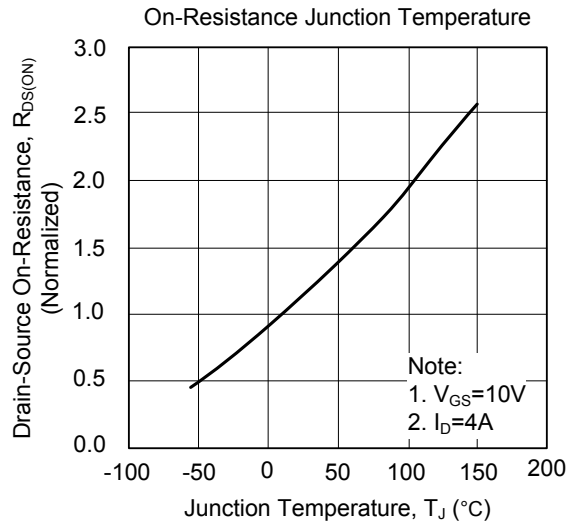
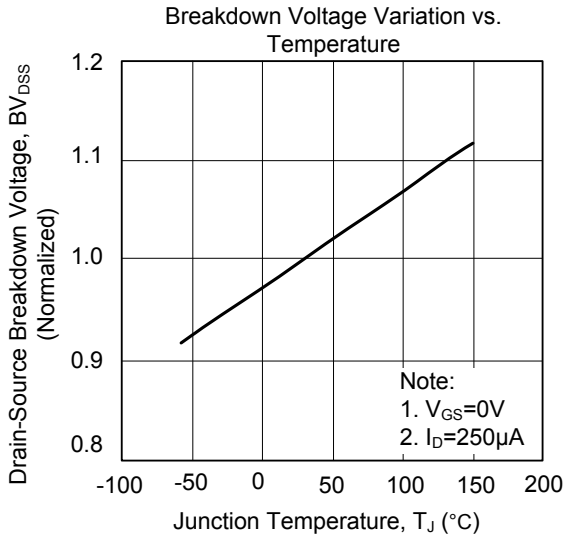


Unclamped Inductive Switching Waveforms

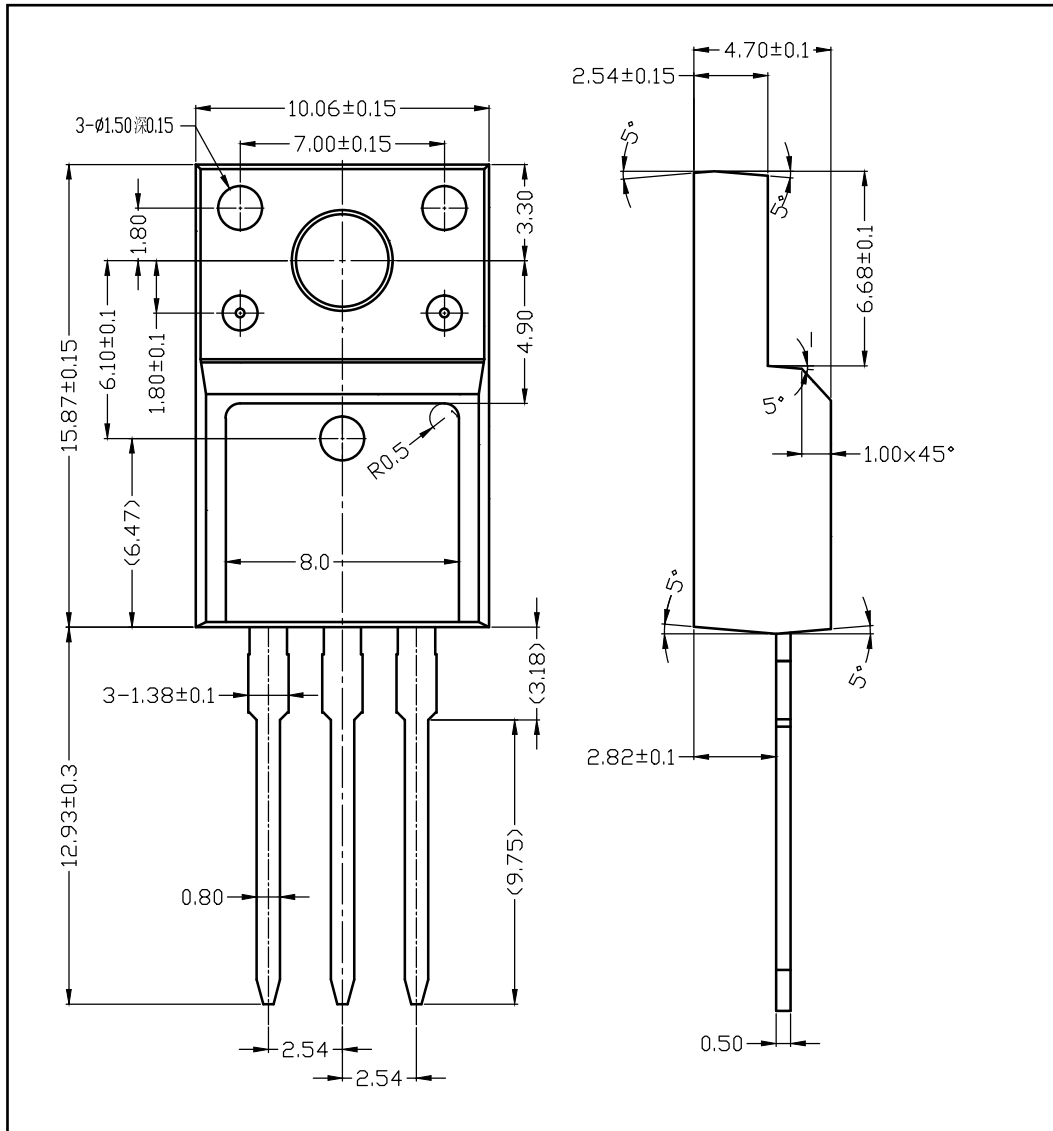
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220F PACKAGE OUTLINE DIMENSIONS



■ TO-220PACKAGE OUTLINE DIMENSIONS

