

■ PRODUCT CHARACTERISTICS

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

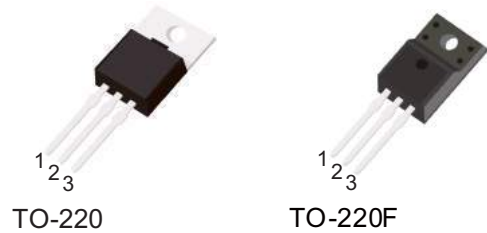
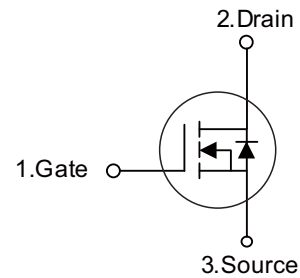
■ APPLICATIONS

- * 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
	Pulsed (Note 2)	I_{DM}	32
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	230
	Repetitive (Note 2)	E_{AR}	14.7
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	P_D	147
	TO-220F		48
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 $T_J = 25^\circ\text{C}$

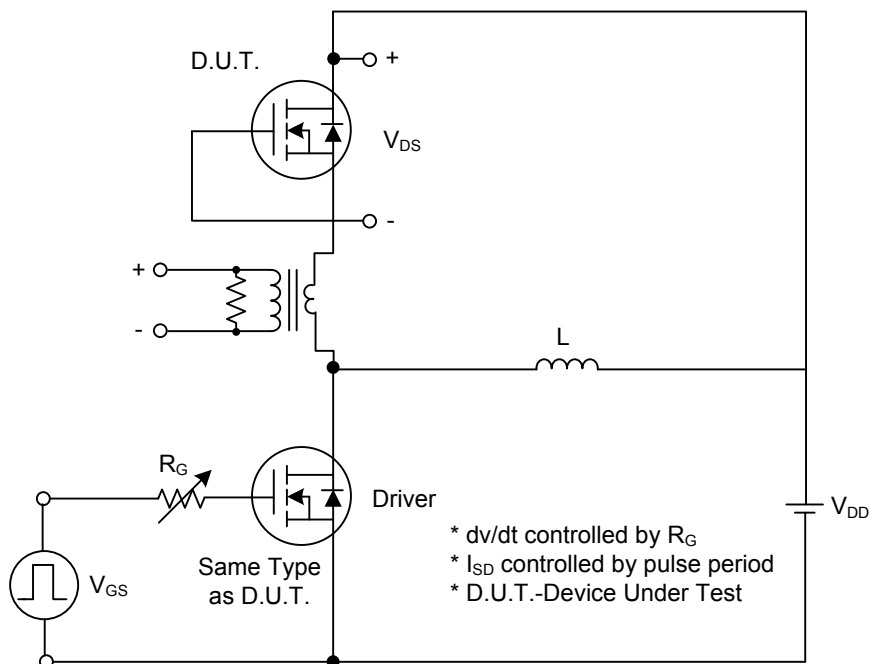
4. $I_{SD} \leq 7.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

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

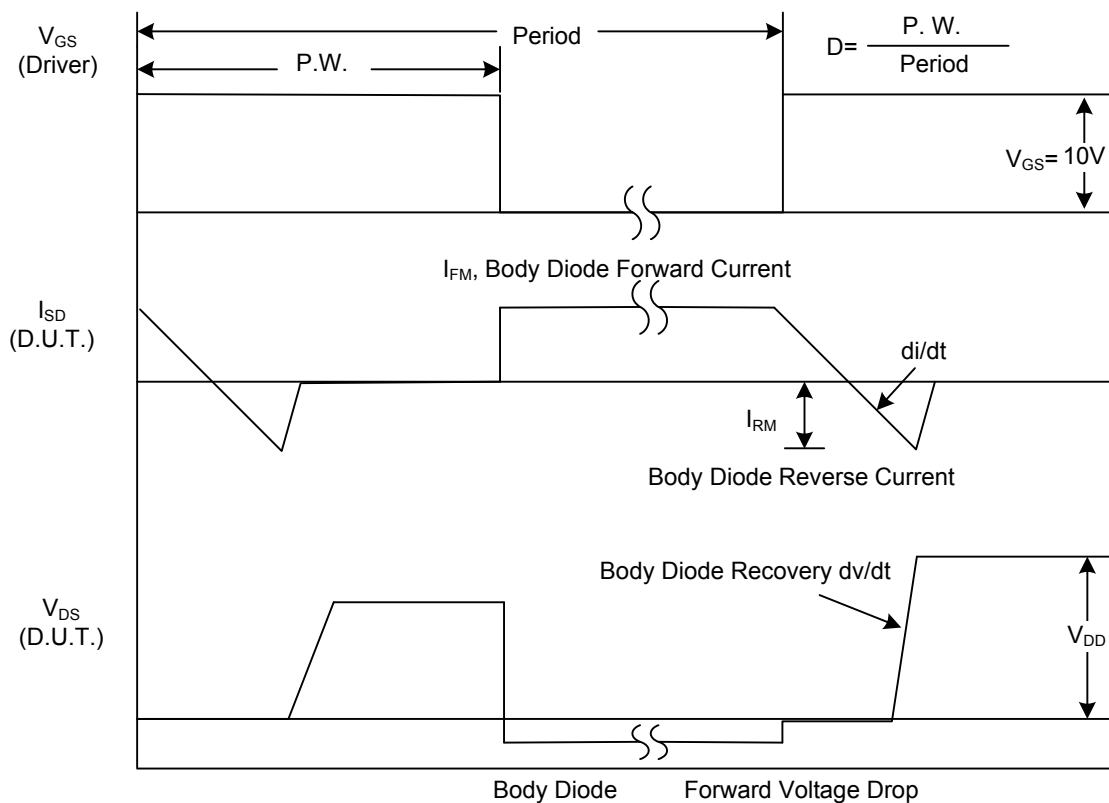
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	600	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$	-	-	10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	-	-	100	nA
	Reverse				-100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu\text{A}$, Referenced to 25°C	-	0.7	-	$\text{V}/^\circ\text{C}$
On characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	-	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 4\text{ A}$	-	1.0	1.2	Ω
Dynamic characteristics						
Input Capacitance	C_{ISS}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	-	965	-	pF
Output Capacitance	C_{OSS}		-	105	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	12	-	pF
Switching characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 300\text{ V}, I_D = 8\text{ A},$ $R_G = 25\Omega$ (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	$V_{DS} = 480\text{ V}, I_D = 8\text{ A},$ $V_{GS} = 10\text{ V}$ (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}	$V_{GS} = 0\text{ V}, I_S = 8\text{ A}$	-	-	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}	$V_{GS} = 0\text{ V}, I_S = 8\text{ A},$ $di_F/dt = 100\text{ A}/\mu\text{s}$ (Note 2)	-	365	-	ns
Reverse Recovery Charge	Q_{RR}		-	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

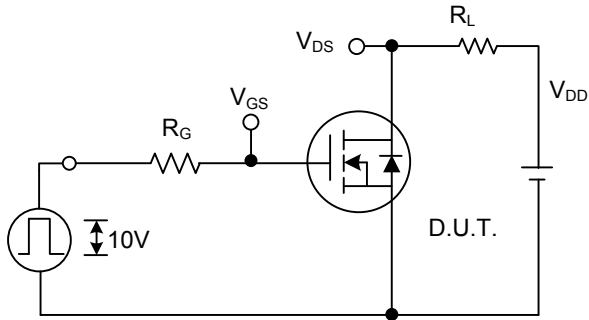


Peak Diode Recovery dv/dt Test Circuit

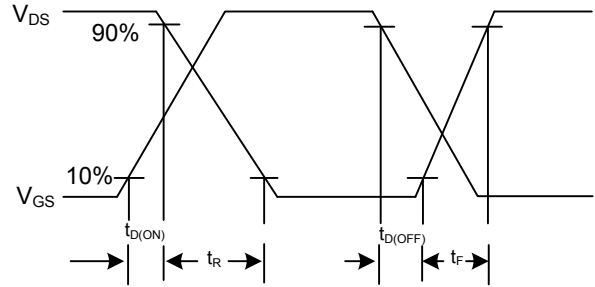


Peak Diode Recovery dv/dt Waveforms

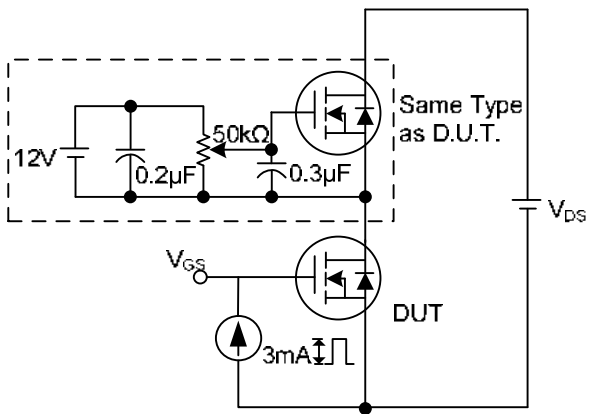
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



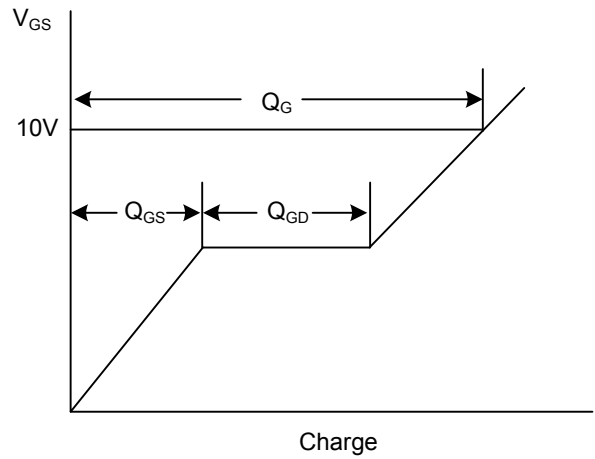
Switching Test Circuit



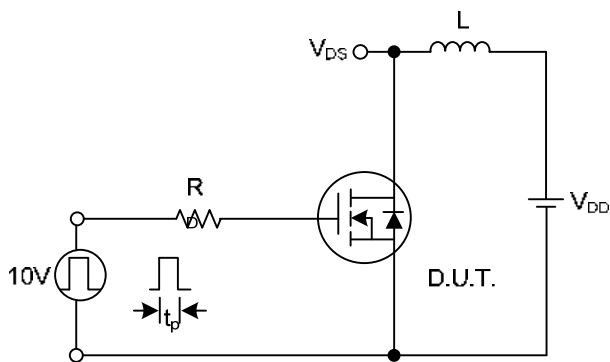
Switching Waveforms



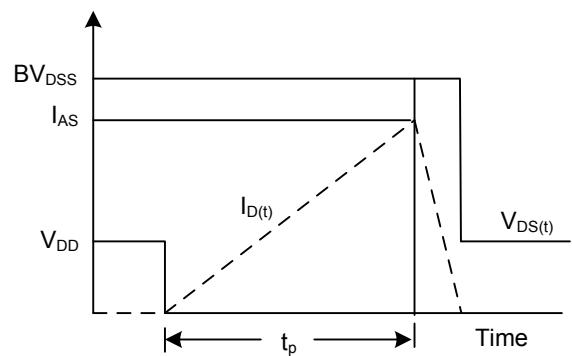
Gate Charge Test Circuit



Gate Charge Waveform

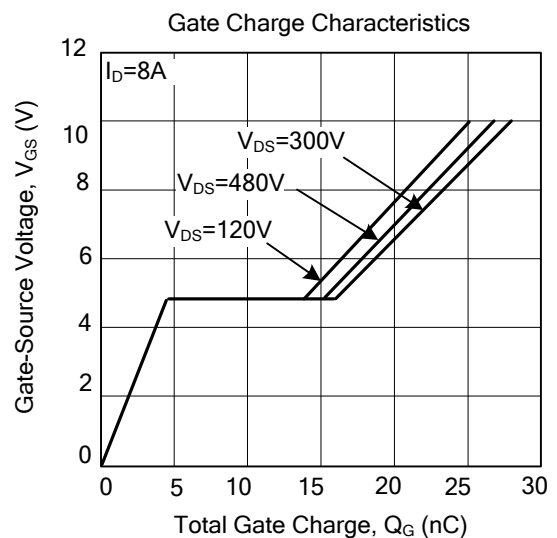
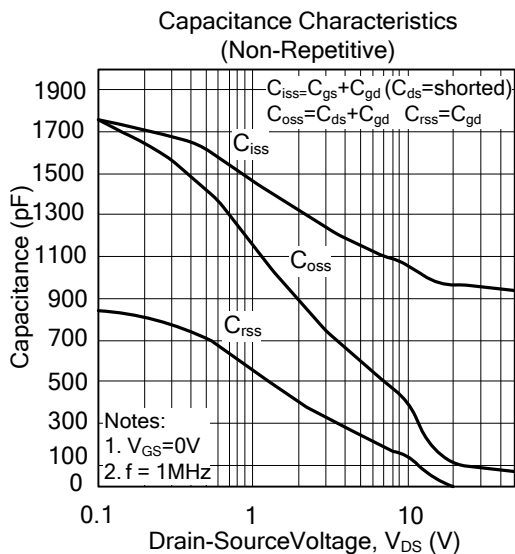
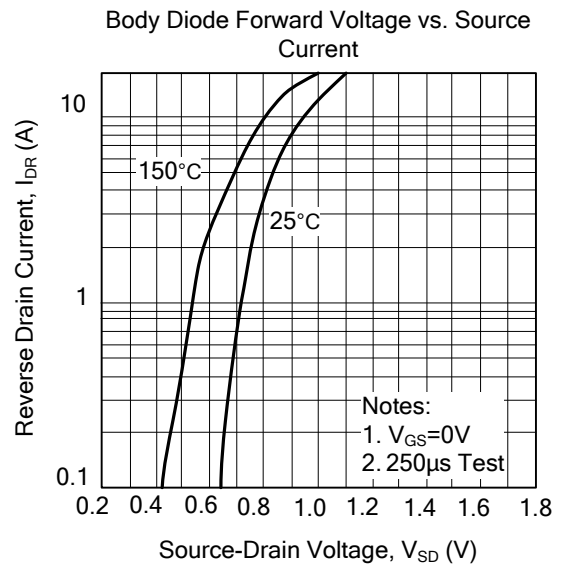
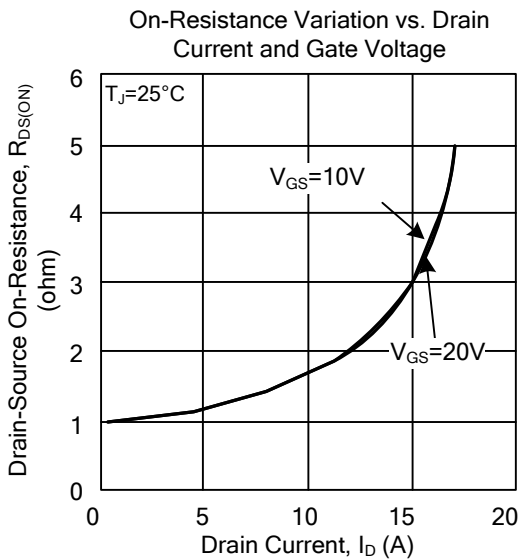
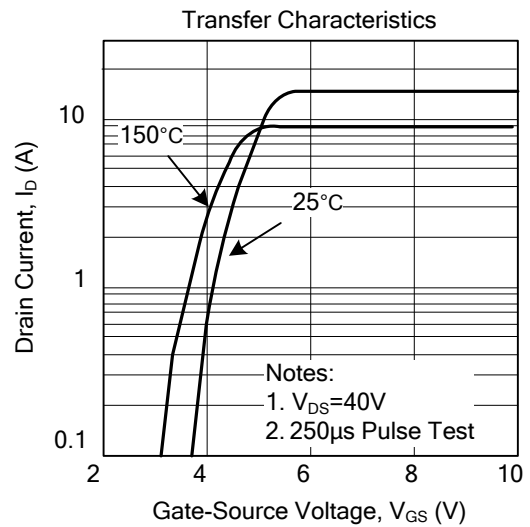
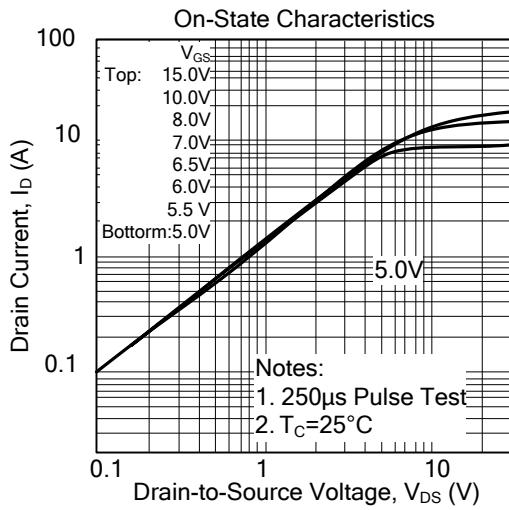


Unclamped Inductive Switching Test Circuit

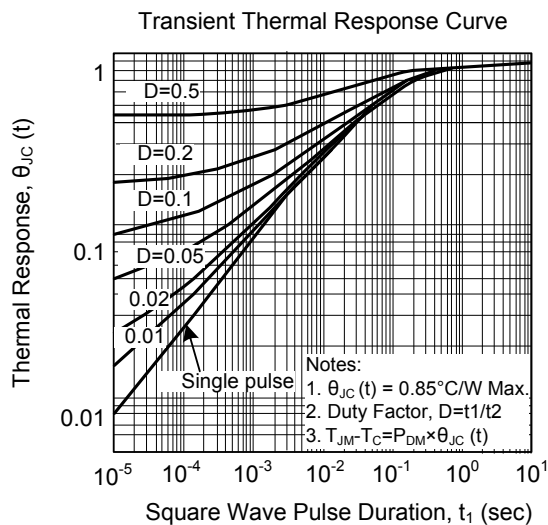
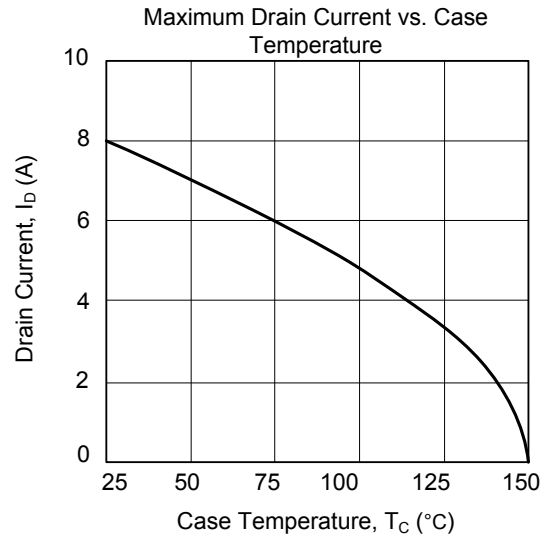
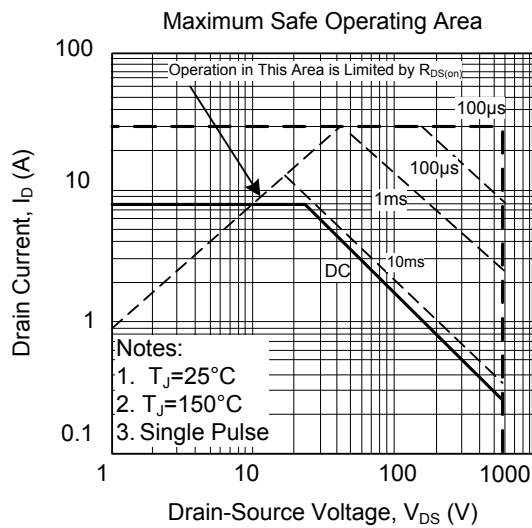
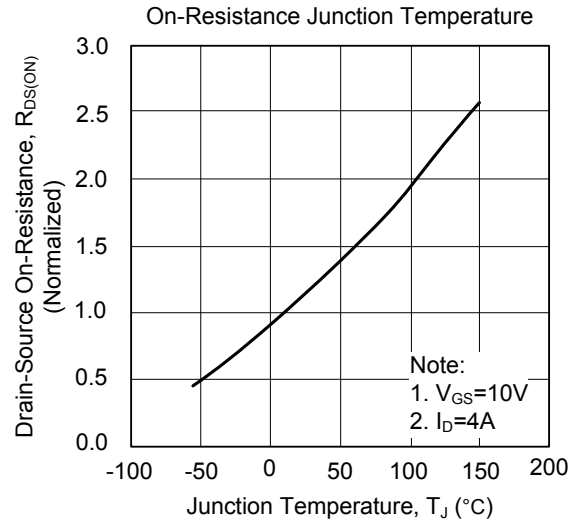
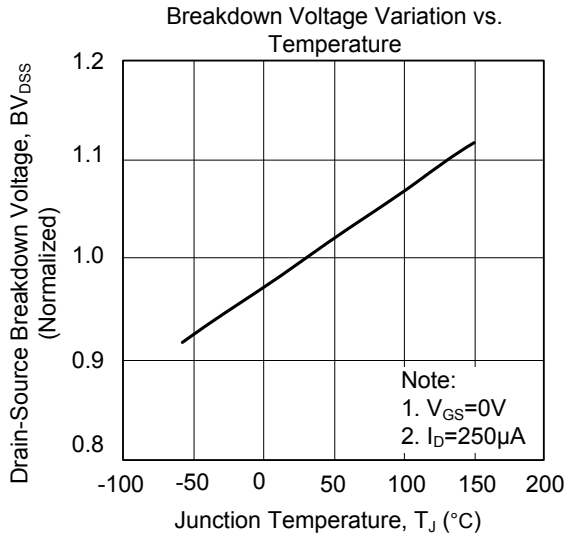


Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

