

PRODUCT CHARACTERISTICS

VDSS	500V
$R_{DS(on)}$ typ. (@ $V_{GS} = 10\text{ V}$)	0.7 Ω
Qg@type	28nC
ID	9A

APPLICATIONS

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

FEATURES

- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT9N50D	TO-252	2500 pieces /Reel
N/A	MOT9N50C	TO-251	70 pieces/Tube

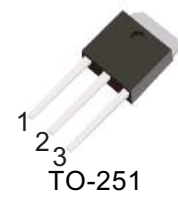
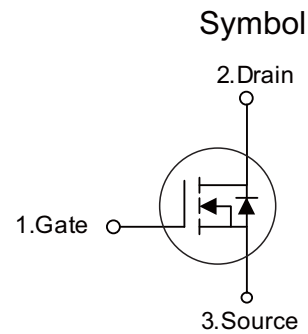
ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current	Continuous ($T_C=25^\circ\text{C}$)	I_D	9 (Note 5)
	Pulsed (Note 2)	I_{DM}	36 (Note 5)
Avalanche Current (Note 2)	I_{AR}	9	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	360
	Repetitive (Note 4)	E_{AR}	13.5
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	P_D	44	W
Derate above 25°C		0.35	W/°C
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. $L = 8\text{mH}$, $I_{AS} = 9\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
4. $I_{SD} \leq 9\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
5. Drain current limited by maximum junction temperature

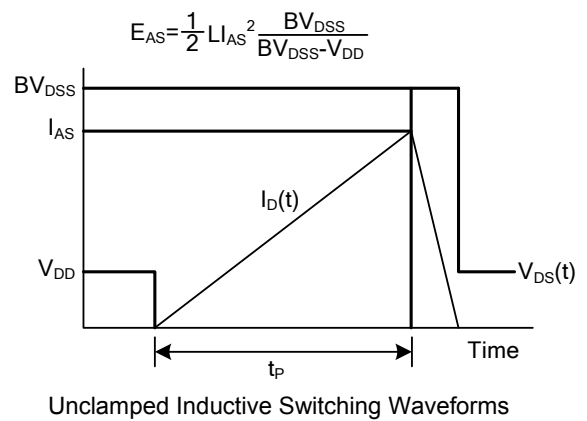
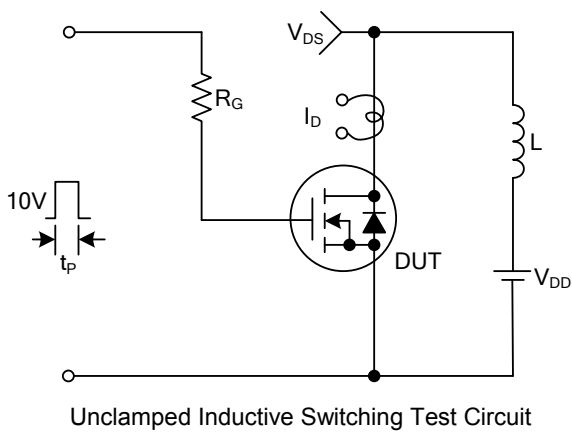
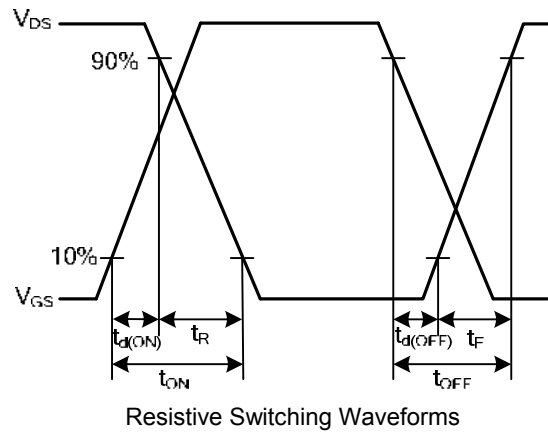
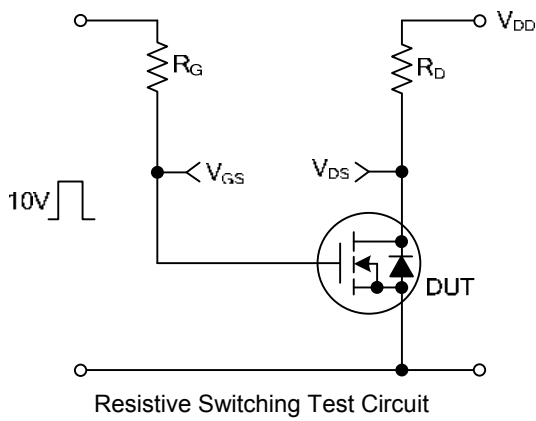
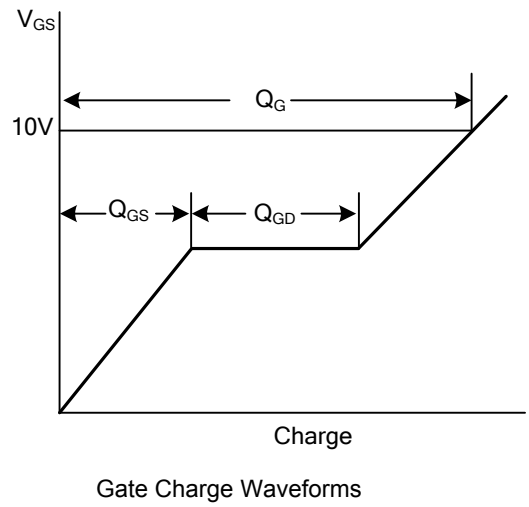
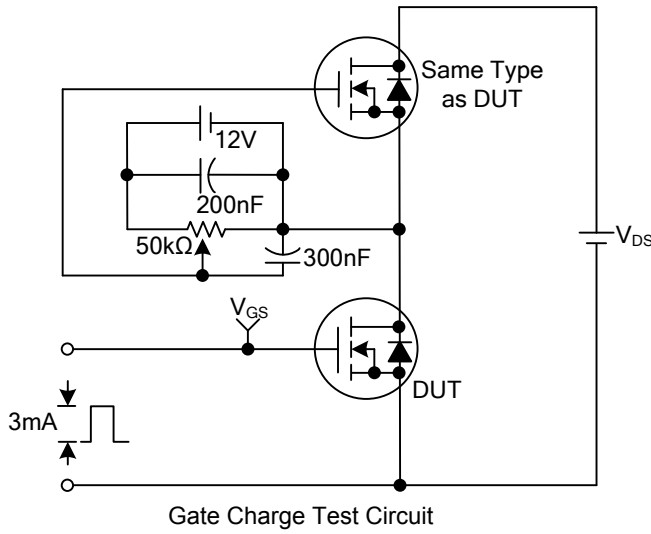


■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

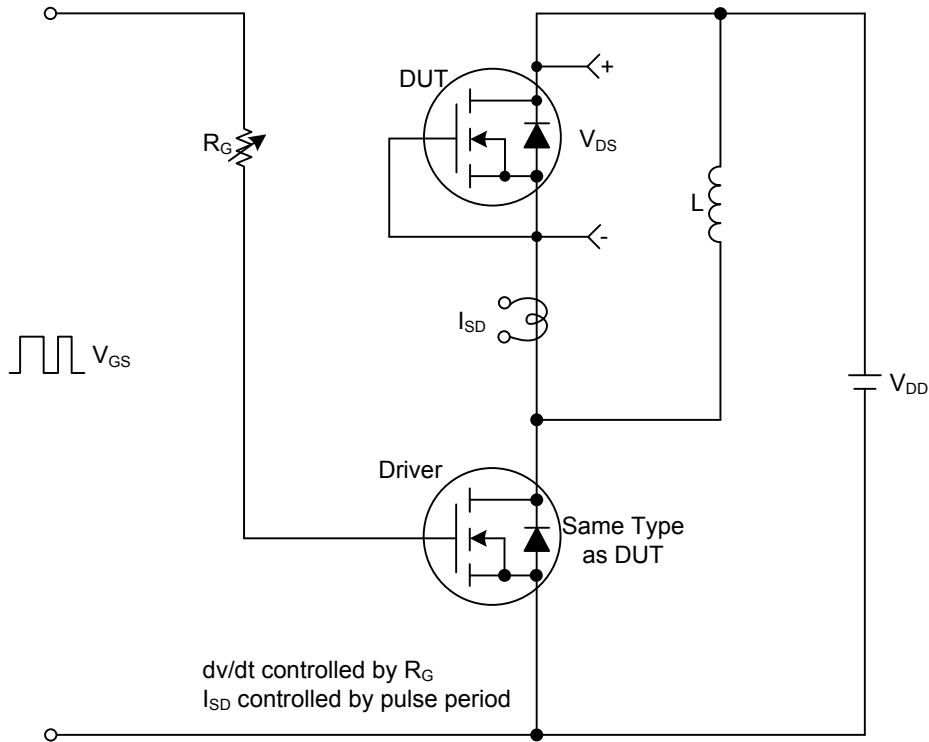
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	500	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=500\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
		$V_{DS}=400\text{V}$, $T_C=125^{\circ}\text{C}$	-	-	10	
Gate- Source Leakage Current	Forward	I_{GSS}	-	-	+100	nA
	Reverse				-100	
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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4.5\text{A}$	-	0.7	0.73	Ω
Dynamic characteristics						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$	-	790	-	pF
Output Capacitance	C_{OSS}		-	130	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	24	-	pF
Switching characteristics						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=400\text{V}$, $I_D=9\text{A}$ (Note 1, 2)	-	28	-	nC
Gate to Source Charge	Q_{GS}		-	4	-	nC
Gate to Drain Charge	Q_{GD}		-	15	-	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=250\text{V}$, $I_D=9\text{A}$, $R_G=25\Omega$ (Note 1, 2)	-	18	-	ns
Rise Time	t_R		-	65	-	ns
Turn-OFF Delay Time	$t_{D(OFF)}$		-	93	-	ns
Fall-Time	t_F		-	64	-	ns
Source-drain diode ratings and characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	9	A
Maximum Body-Diode Pulsed Current	I_{SM}		-	-	36	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=9\text{A}$, $V_{GS}=0\text{V}$	-	-	1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_S=9\text{A}$, $V_{GS}=0\text{V}$, $dI_F/dt=100\text{A}/\mu\text{s}$ (Note 1)	-	335	-	ns
Body Diode Reverse Recovery Charge	Q_{RR}		-	2.95	-	μC

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

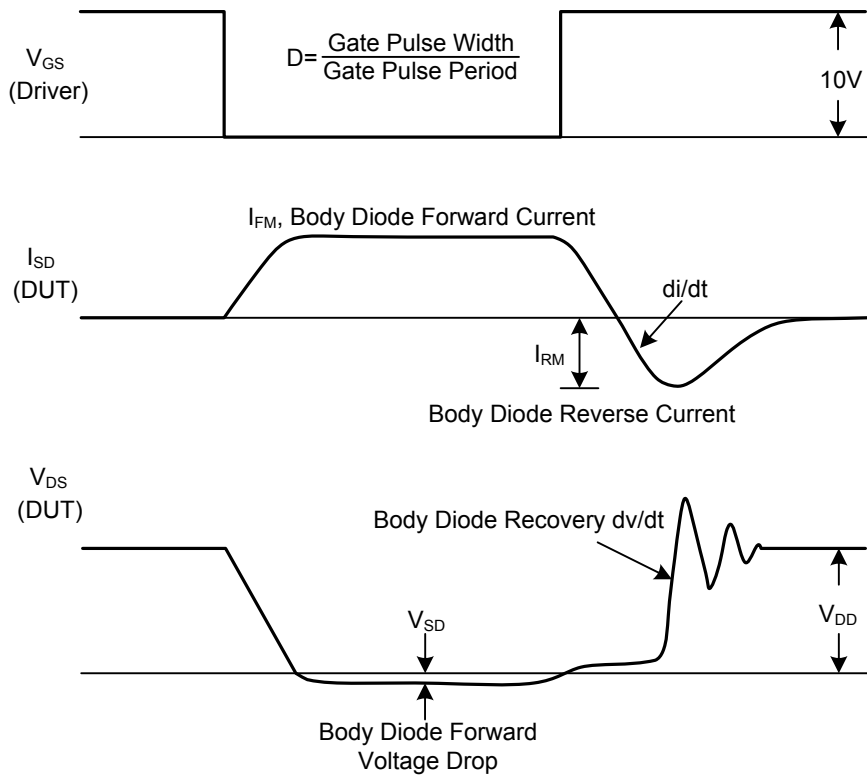
■ TEST CIRCUITS AND WAVEFORMS



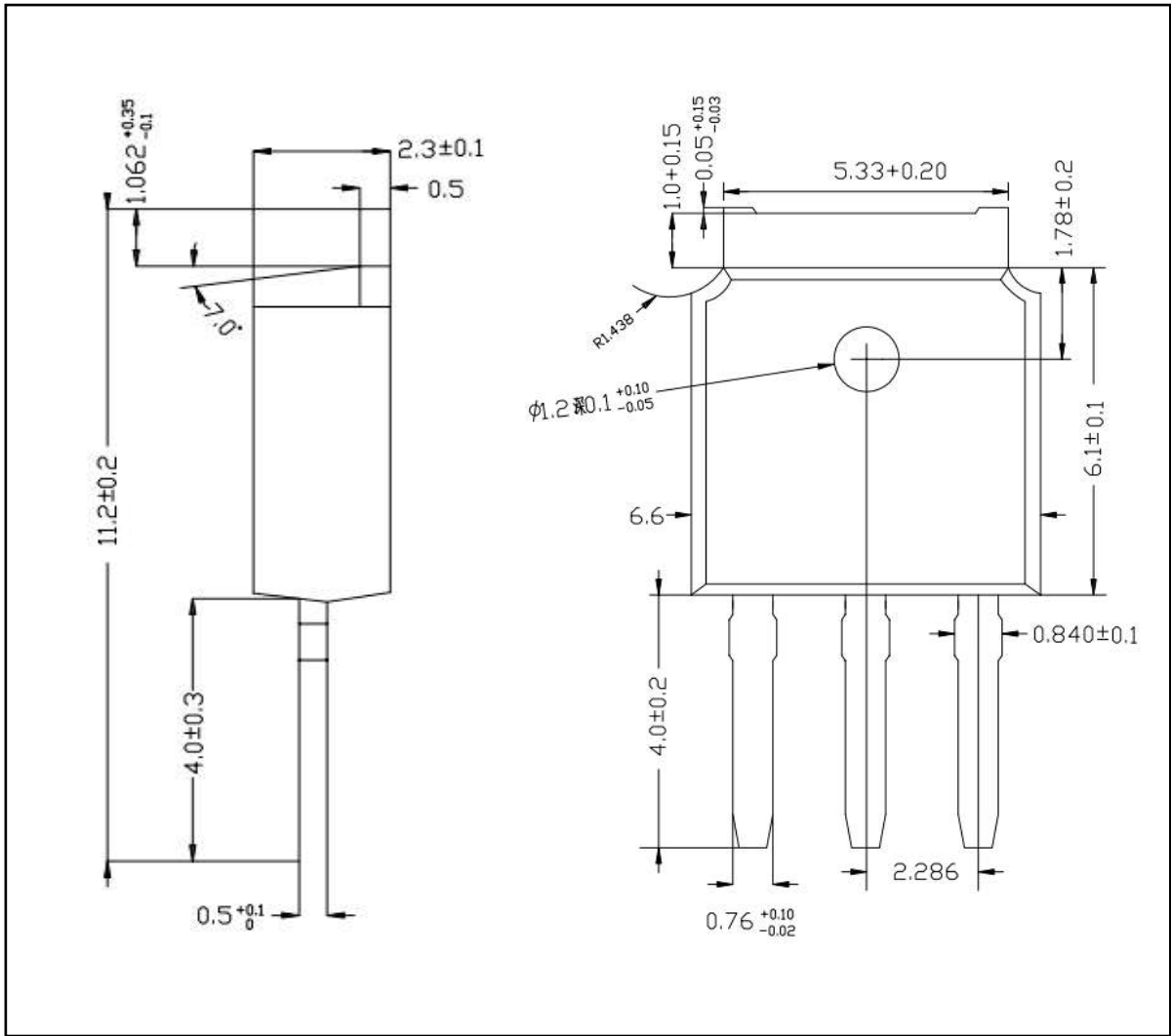
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



■ TO-251 PACKAGE OUTLINE DIMENSIONS



■ TO-252 PACKAGE OUTLINE DIMENSIONS

