

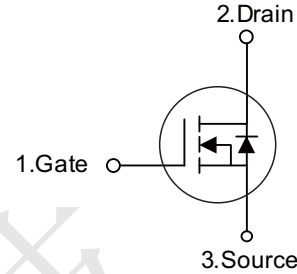


MOT9N50C/MOT9N50D N-CHANNEL MOSFET

■ PRODUCT CHARACTERISTICS

VDSS	500V
$R_{DS(on)max}(@V_{GS}=10V)$	0.72Ω
Qg@type	35nC
ID	9A

Symbol



■ APPLICATIONS

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

■ FEATURES

- * $R_{DS(ON)} < 0.72\Omega @ V_{GS}=10V$
- * 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 ($T_C=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	±30	V
Drain Current	Continuous ($T_C=25^\circ C$)	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. $L = 8mH$, $I_{AS} = 9A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$
4. $I_{SD} \leq 9A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ C$
5. Drain current limited by maximum junction temperature



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

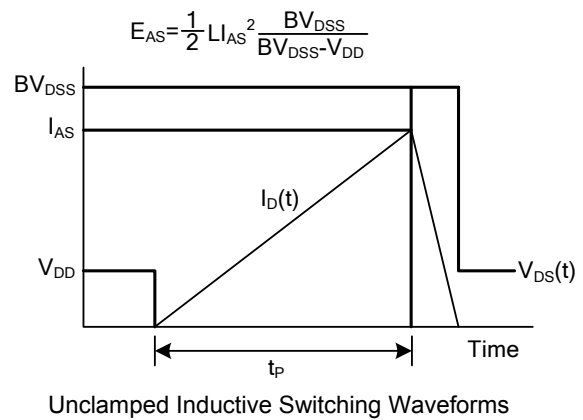
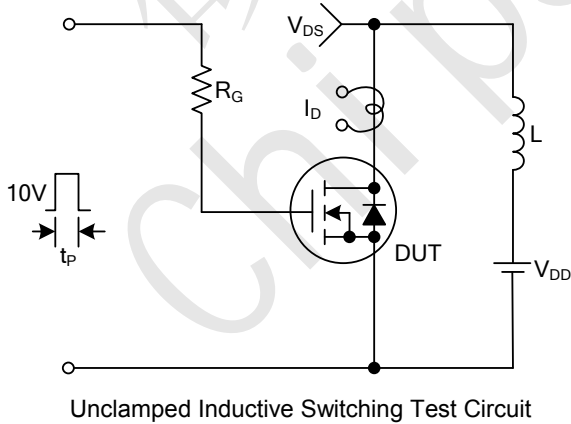
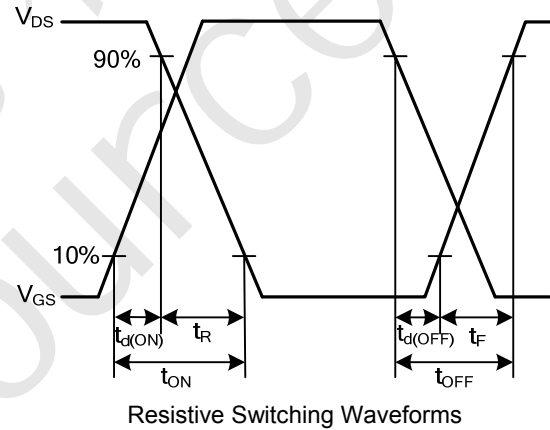
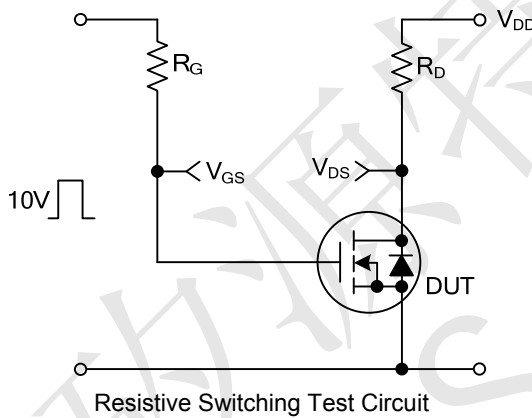
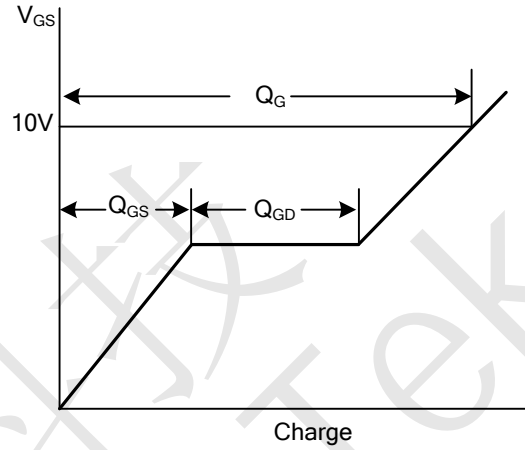
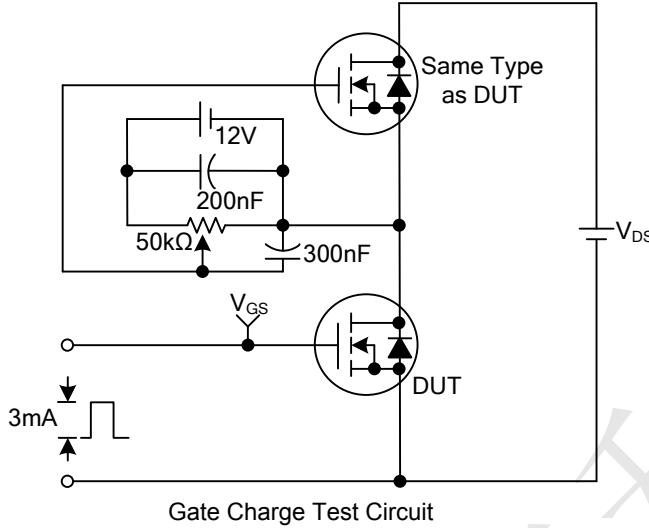
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	500			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=500\text{V}$, $V_{GS}=0\text{V}$			1	μA
			$V_{DS}=400\text{V}$, $T_C=125^\circ\text{C}$			10	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
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		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4.5\text{A}$		0.69	0.72	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		790	1030	pF
Output Capacitance		C_{OSS}			130	170	
Reverse Transfer Capacitance		C_{RSS}			24	30	
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{GS}=10\text{V}$, $V_{DS}=400\text{V}$, $I_D=9\text{A}$ (Note 1, 2)		28	35	nC
Gate to Source Charge		Q_{GS}			4		
Gate to Drain Charge		Q_{GD}			15		
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	45	ns
Rise Time		t_R			65	140	
Turn-OFF Delay Time		$t_{D(OFF)}$			93	195	
Fall-Time		t_F			64	125	
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}	$I_S=9\text{A}$, $V_{GS}=0\text{V}$, $dI_F/dt=100\text{A}/\mu\text{s}$			335	ns
Body Diode Reverse Recovery Charge		Q_{RR}	(Note 1)			2.95	

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



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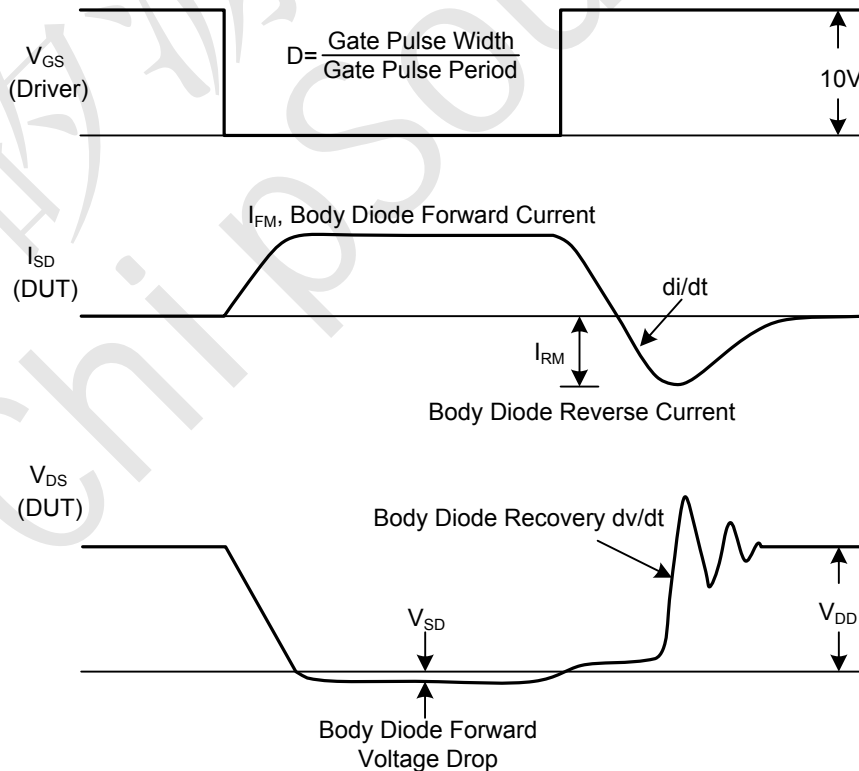
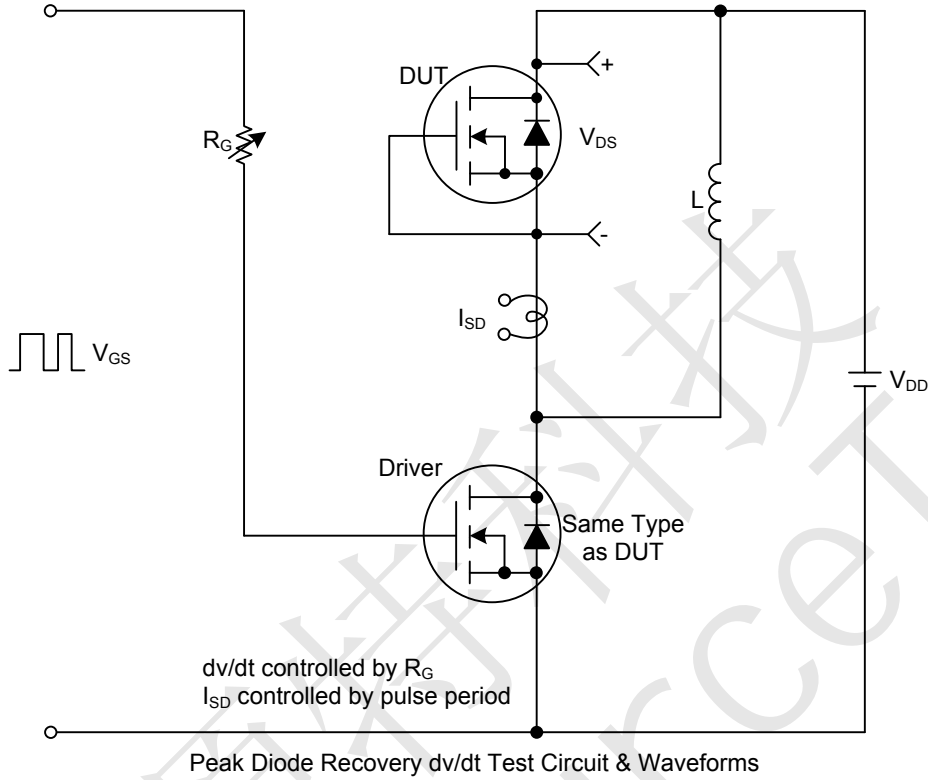
■ TEST CIRCUITS AND WAVEFORMS





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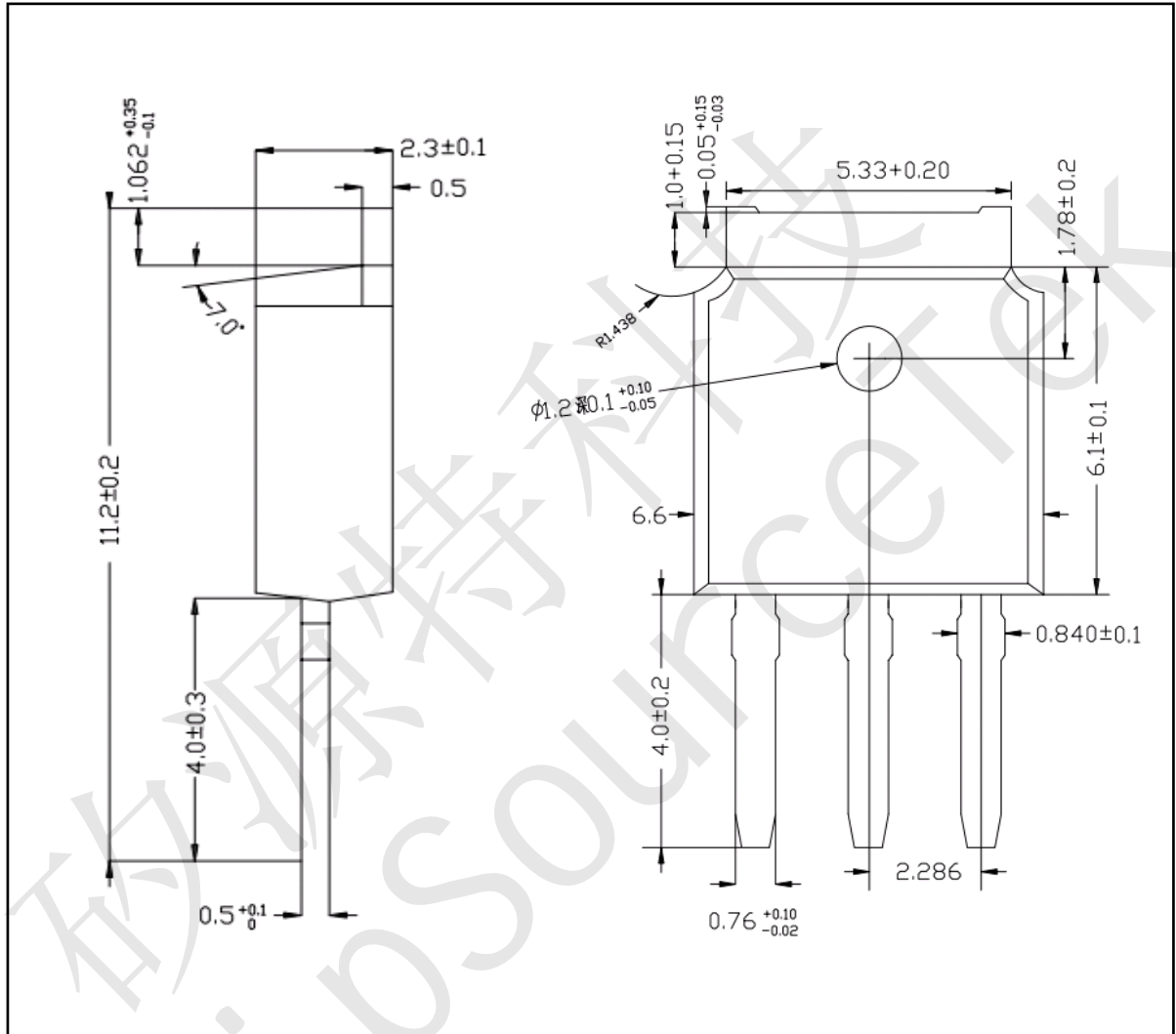
■ TEST CIRCUITS AND WAVEFORMS(Cont.)





MOT9N50C/MOT9N50D N-CHANNEL MOSFET

■ TO-251 PACKAGE OUTLINE DIMENSIONS





MOT9N50C/MOT9N50D N-CHANNEL MOSFET

■ TO-252 PACKAGE OUTLINE DIMENSIONS

