

PRODUCT CHARACTERISTICS

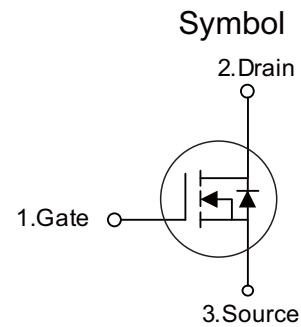
VDSS	500V
$R_{DS(on)typ}(V_{GS}=10V)$	0.7Ω
Qg@type	35nC
ID	9A

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	MOT9N50F	TO-220F	50 pieces/Tube
N/A	MOT9N50A	TO-220	50 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°C)	I _D	9 (Note 5)	A
	Pulsed (Note 2)	I _{DM}	36 (Note 5)	A
Avalanche Current (Note 2)		I _{AR}	9	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	360	mJ
	Repetitive (Note 4)	E _{AR}	13.5	mJ
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 $T_J = 25^\circ\text{C}$

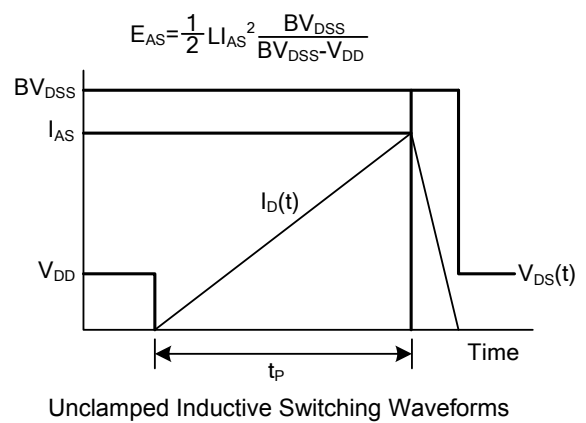
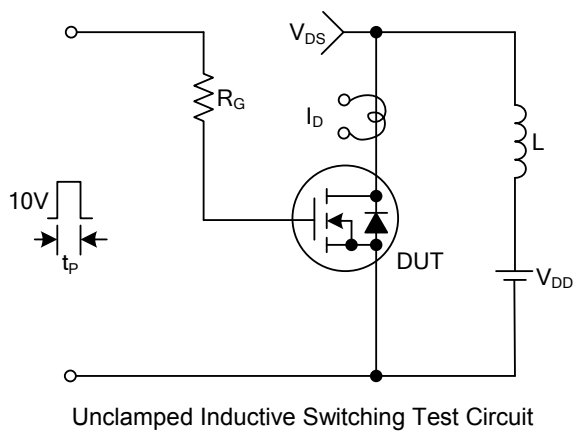
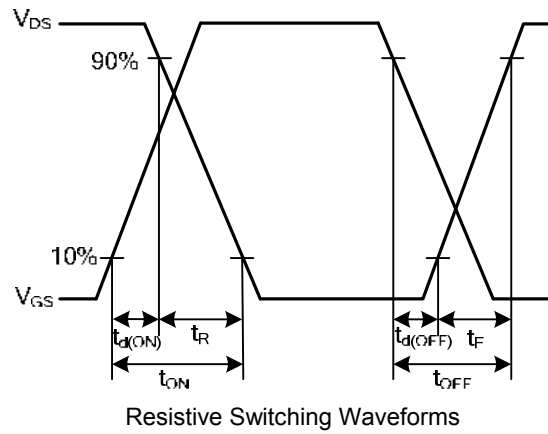
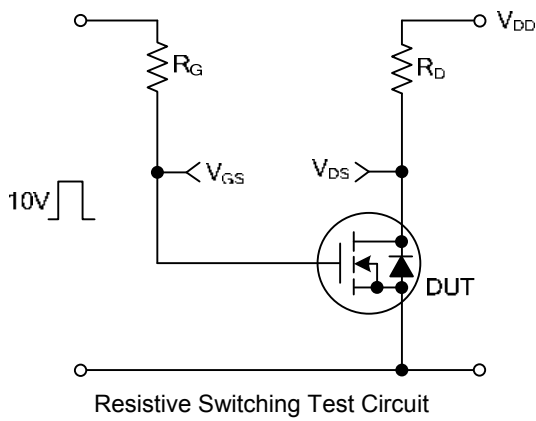
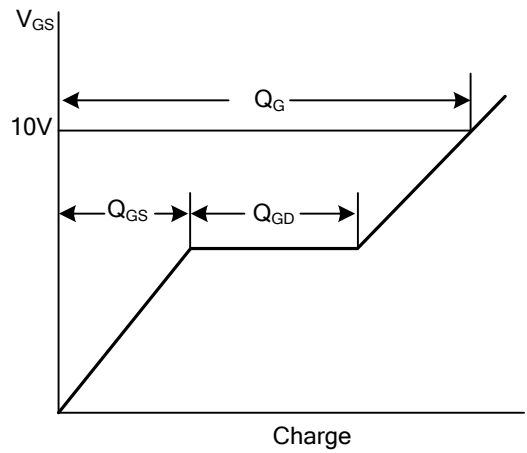
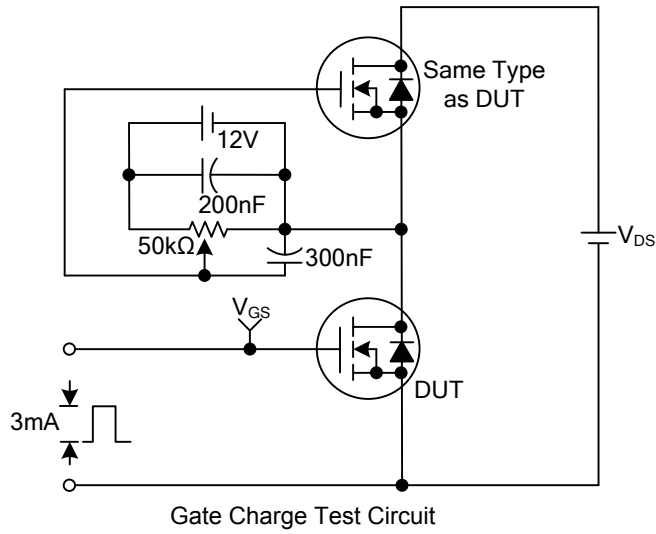
5. Drain current limited by maximum junction temperature

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

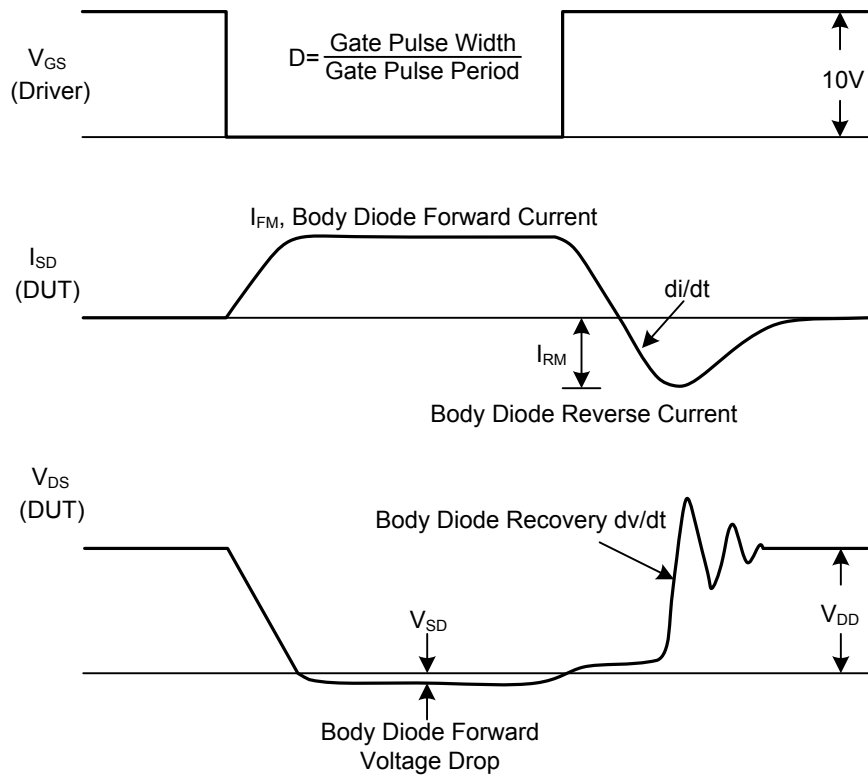
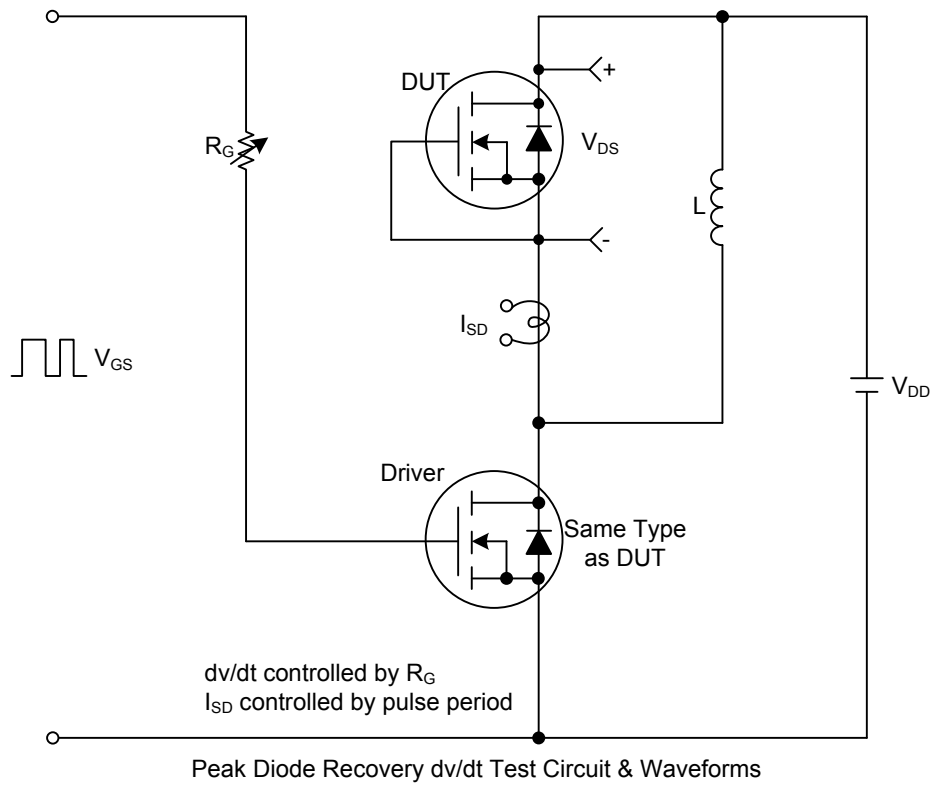
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	500	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =500V, V _{GS} =0V	-	-	1	μA
			V _{DS} =400V, T _C =125°C	-	-	10	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+30V, V _{DS} =0V	-	-	+100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V	-	-	-100	nA
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 =4.5A	-	0.7	0.73	Ω
Dynamic characteristics							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz	-	790	-	pF
Output Capacitance		C _{OSS}		-	130	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	24	-	pF
Switching characteristics							
Total Gate Charge		Q _G	V _{GS} =10V, V _{DS} =400V, I _D =9A (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} =250V, I _D =9A, R _G =25Ω (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 =9A, V _{GS} =0V	-	-	1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =9A, V _{GS} =0V, dI _F /dt=100A/μs	-	335	-	ns
Body Diode Reverse Recovery Charge		Q _{RR}	(Note 1)	-	2.95	-	μC

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

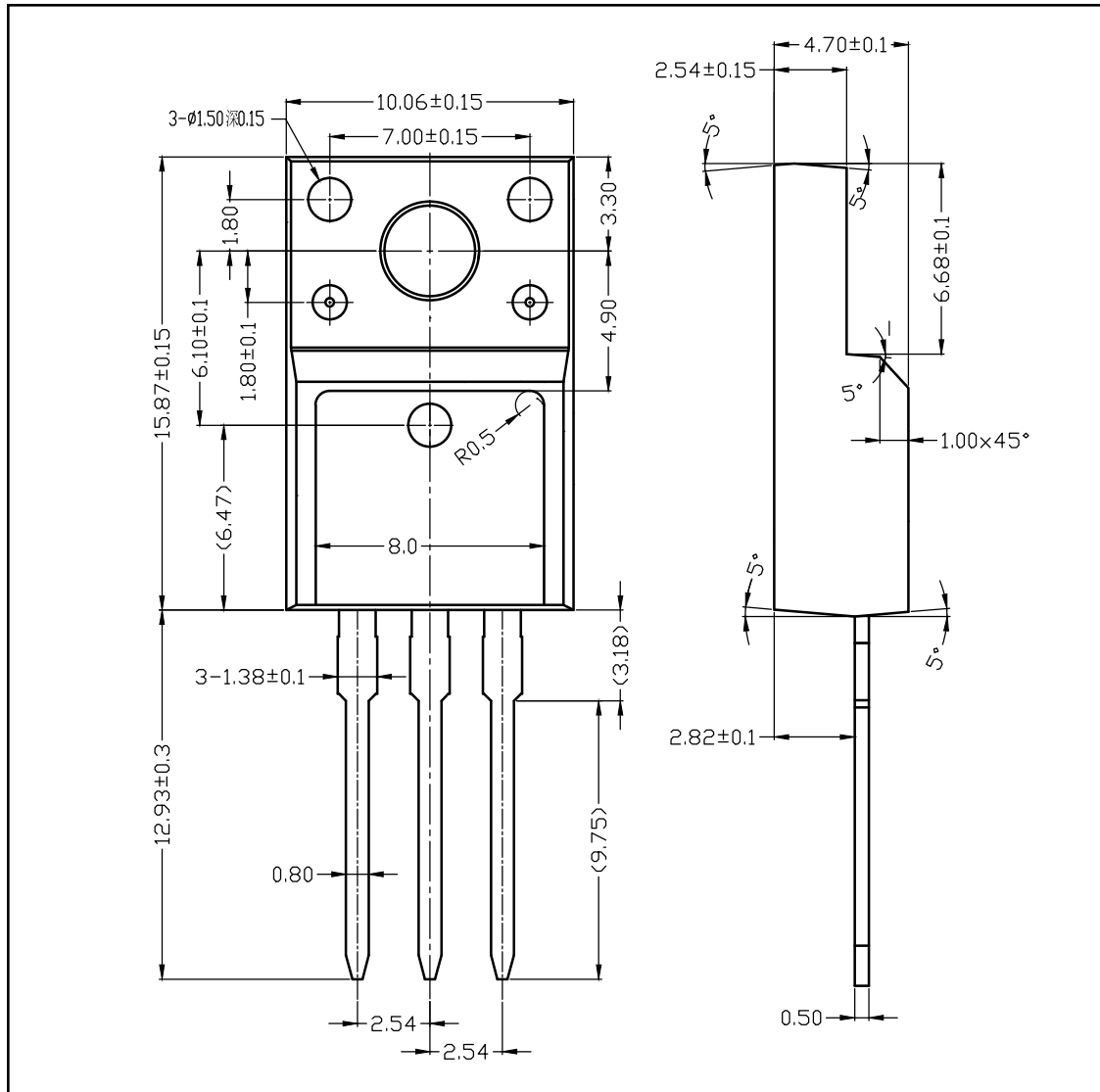
■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

