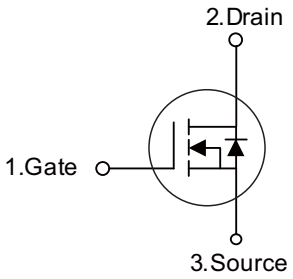
■ PRODUCT CHARACTERISTICS

VDSS	650V
R_{DS}(on)typ(@V_{GS} =10 V)	4.3Ω
Qg@type	14nC
ID	2A

Symbol



■ APPLICATIONS

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

■ FEATURES

* Fast switching capability
* Avalanche energy specified
* Improved dv/dt capability, high ruggedness

TO-220

TO-220F

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2N65A	TO-220	50 pieces/Tube
N/A	MOT2N65F	TO-220F	50 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Avalanche Current (Note 2)		I_{AR}	2.0	A
Drain Current	Continuous	I_D	2.0	A
	Pulsed (Note 2)	I_{DM}	8.0	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	110	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation		P_D	44	W
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OPR}	-55 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

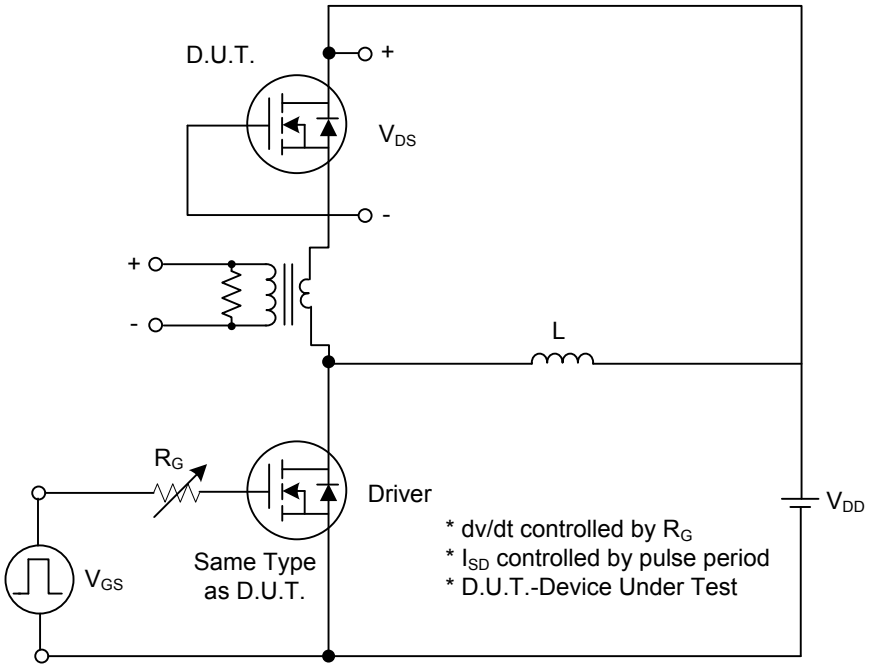
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating : Pulse width limited by T_J.
3. L=55mH, I_{AS}=2.0A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD}≤2.4A, di/dt≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

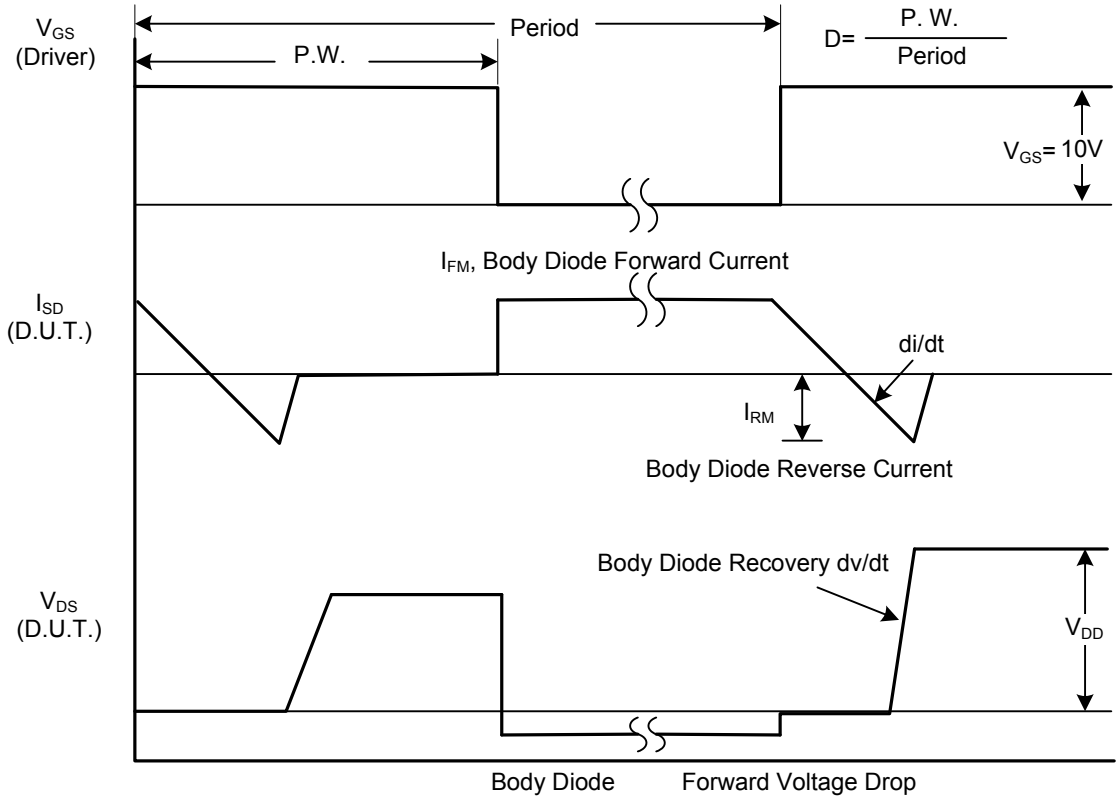
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} = 0V, I_D = 250μA	650	-	-	V
Drain-Source Leakage Current		I_{DSS}	V_{DS} = 650V, V_{GS} = 0V	-	-	10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS} = 30V, V_{DS} = 0V	-	-	100	nA
	Reverse		V_{GS} = -30V, V_{DS} = 0V	-	-	-100	nA
Breakdown Voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA, Referenced to 25°C	-	0.4	-	V/°C
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 =1A	-	4.3	6.0	Ω
Dynamic characteristics							
Input Capacitance		C_{ISS}	V_{DS} =25V, V_{GS} =0V, f =1MHz	-	320	-	pF
Output Capacitance		C_{OSS}		-	33	-	pF
Reverse Transfer Capacitance		C_{RSS}		-	4.5	-	pF
Switching characteristics							
Turn-On Delay Time		$t_{D\ (ON)}$	V_{DD} =30V, I_D =0.5A, R_G=25Ω (Note 1, 2)	-	40	-	ns
Turn-On Rise Time		t_R		-	40	-	ns
Turn-Off Delay Time		$t_{D(OFF)}$		-	50	-	ns
Turn-Off Fall Time		t_F		-	22	-	ns
Total Gate Charge		Q_G	V_{DS}=50V, V_{GS}=1.0V, I_D=1.3A (Note 1, 2)	-	14	-	nC
Gate-Source Charge		Q_{GS}		-	5.2	-	nC
Gate-Drain Charge		Q_{GD}		-	2	-	nC
Drain-source diode characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS} = 0 V, I_{SD} = 2.0 A	-	-	1.4	V
Continuous Drain-Source Current		I_{SD}		-	-	2.0	A
Pulsed Drain-Source Current		I_{SM}		-	-	8.0	A

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

■ TEST CIRCUITS AND WAVEFORMS

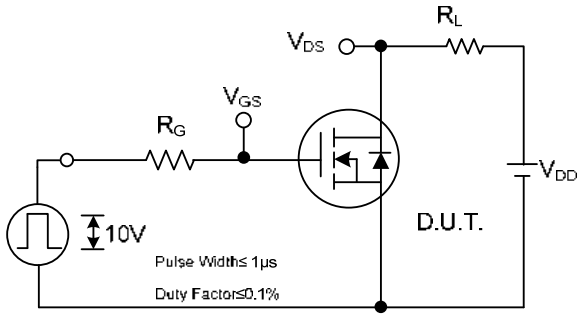


Peak Diode Recovery dv/dt Test Circuit

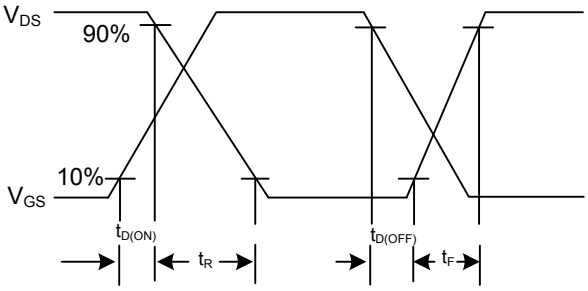


Peak Diode Recovery dv/dt Waveforms

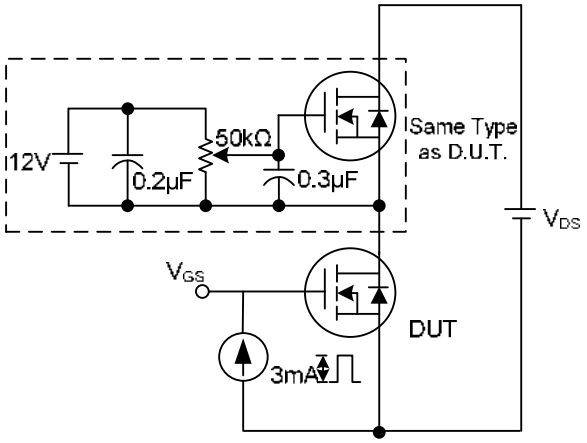
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



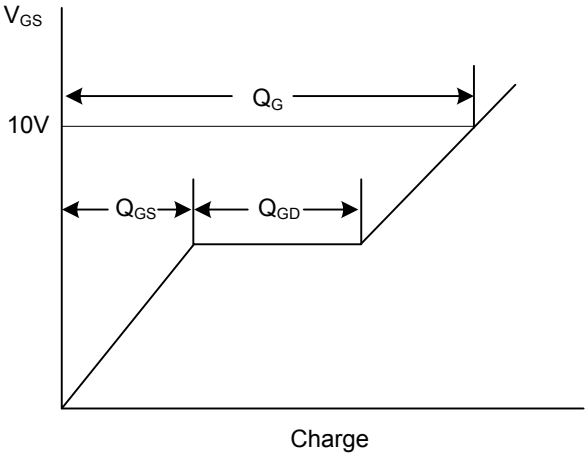
Switching Test Circuit



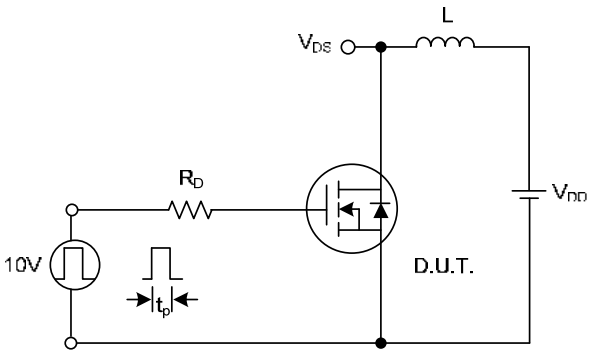
Switching Waveforms



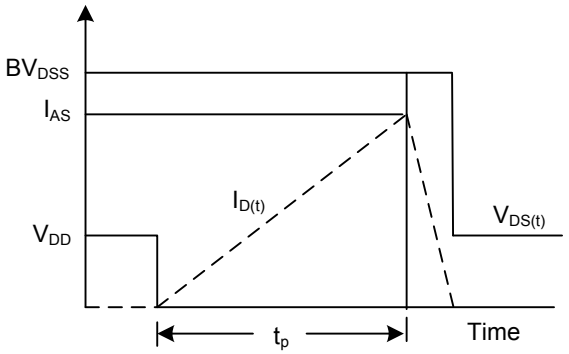
Gate Charge Test Circuit



Gate Charge Waveform

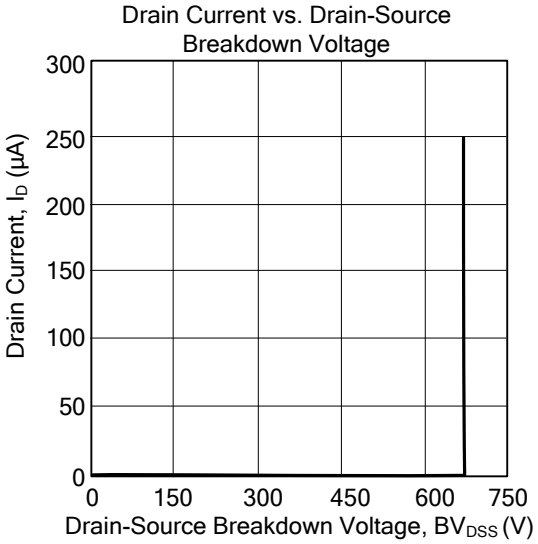


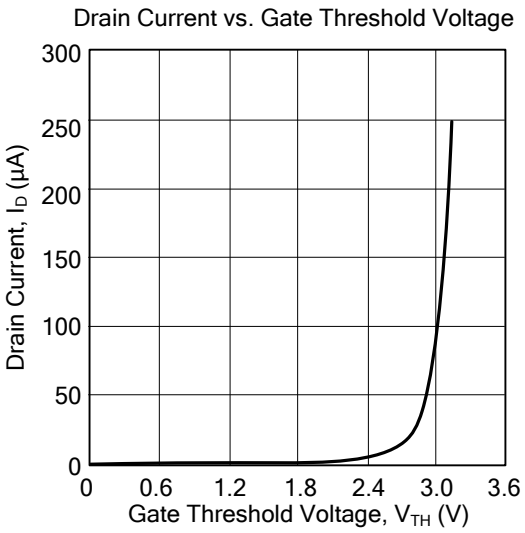
Unclamped Inductive Switching Test Circuit

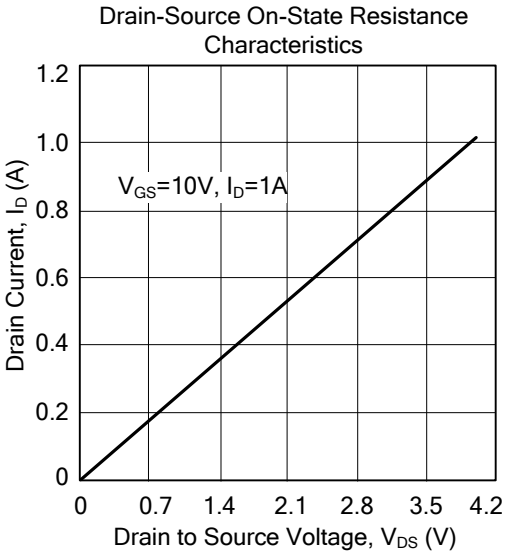


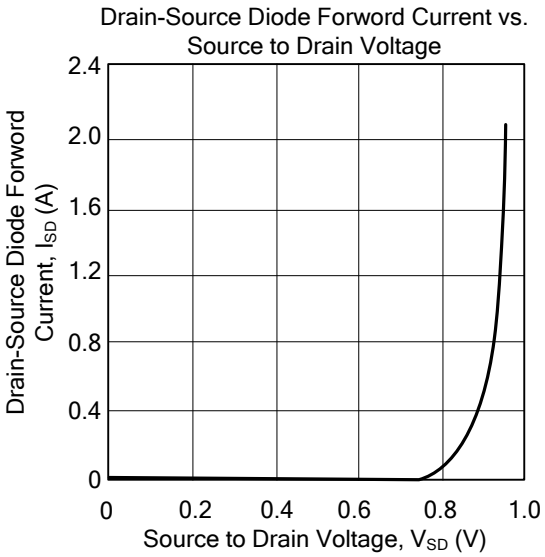
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

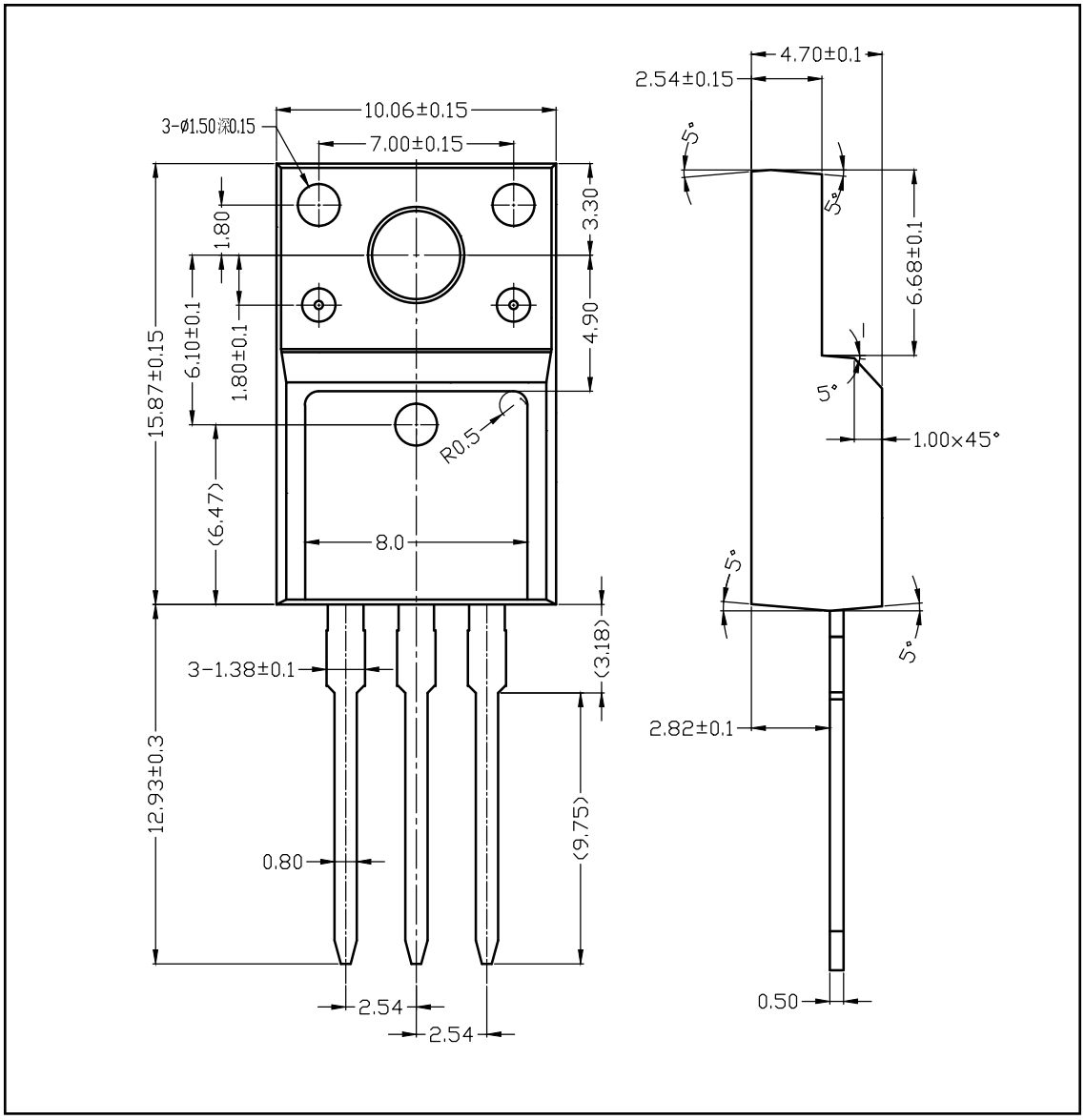








■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS