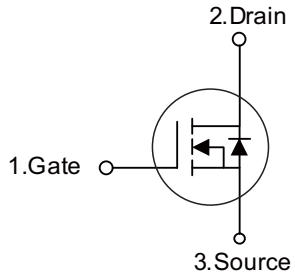
■ PRODUCT CHARACTERISTICS

VDSS	650V
R_{DS}(on)typ(@V_{GS} =10 V)	0.55Ω
Qg@type	57nC
ID	16A

Symbol



■ APPLICATIONS

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

■ FEATURES

* High Switching Speed
* 100% Avalanche Tested

TO-220

TO-220F

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT16N65HF	TO-220F	50 pieces/Tube
N/A	MOT16N65A	TO-220	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
Drain Current	Continuous (T_C =25°C)	I_D	16 (Note 2)	A
	Pulsed (Note 3)	I_{DM}	64 (Note 2)	A
Avalanche Current (Note 3)		I_{AR}	16	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	780	mJ
	Repetitive (Note 5)	E_{AR}	20	mJ
Peak Diode Recovery dv/dt (Note 5)		dv/dt	4.5	V/ns
Power Dissipation	TO-220	P_D	270	W
	TO-220F		60	W
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.

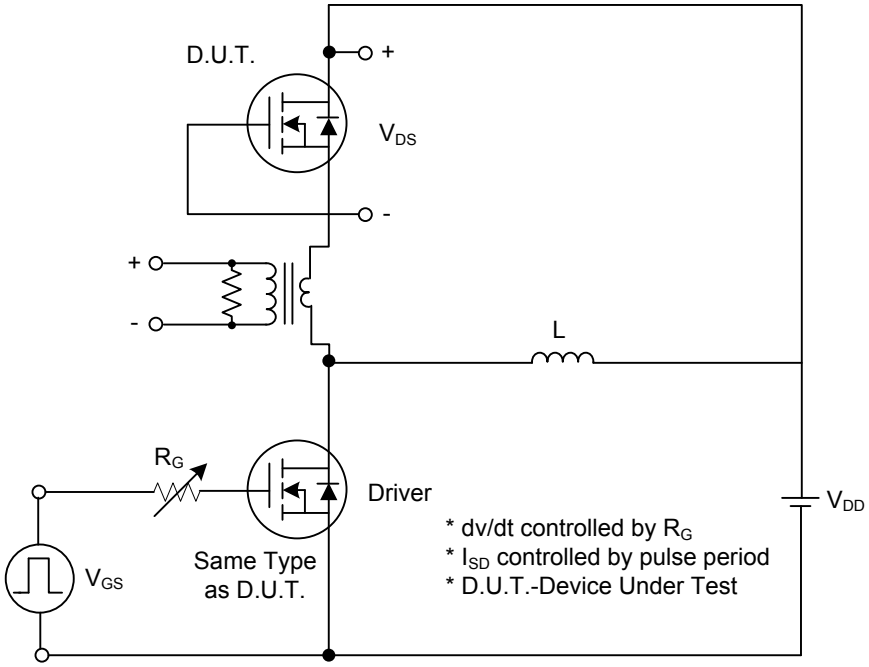
2. Drain current limited by maximum junction temperature
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4. L = 6.1mH, I_{AS} = 16A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
5. I_{SD} ≤ 16A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

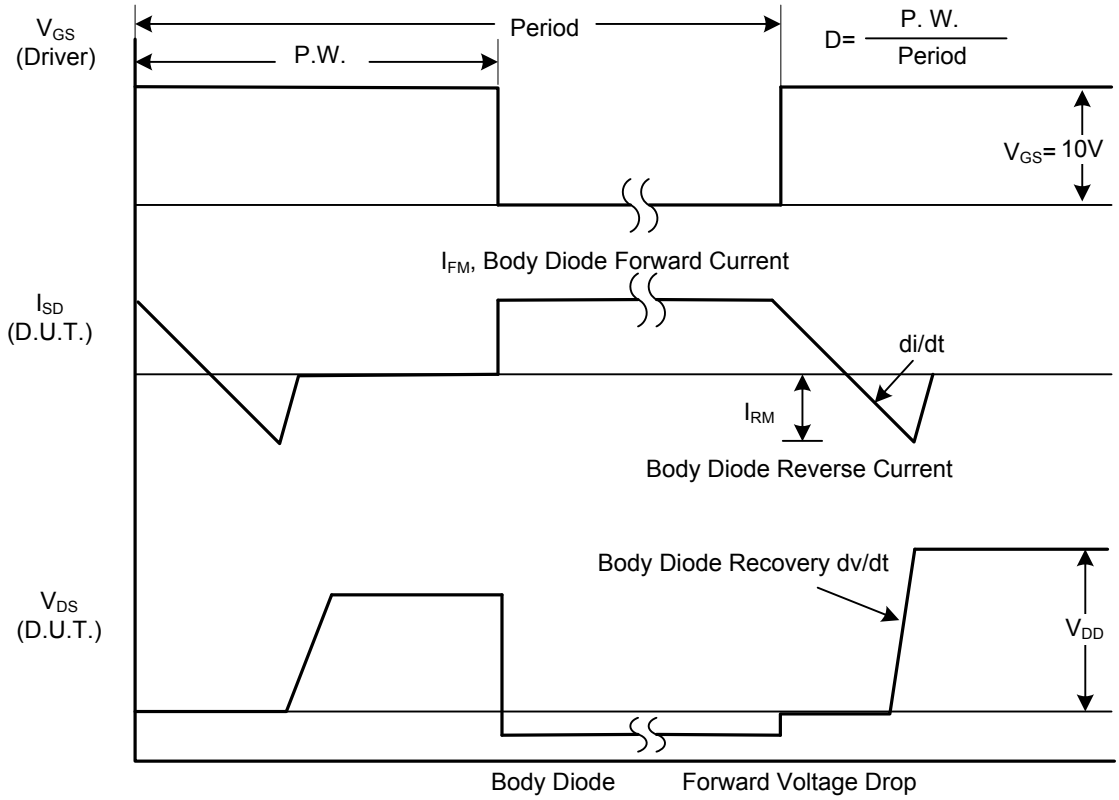
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	650	-	-	V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	μA
			V_{DS}=520V, V_{GS}=0V, T_C=125°C	-	-	10	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V	-	-	+100	nA
	Reverse		V_{GS}=-30V, V_{DS}=0V	-	-	-100	nA
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=8A	-	0.55	0.6	Ω
Dynamic characteristics							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz	-	1078	-	pF
Output Capacitance		C_{OSS}		-	225	-	pF
Reverse Transfer Capacitance		C_{RSS}		-	10	-	pF
Switching characteristics							
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=30V, I_D=0.5A, R_G=25Ω (Note 1, 2)	-	112	-	ns
Rise Time		t_R		-	186	-	ns
Turn-OFF Delay Time		$t_{D(OFF)}$		-	335	-	ns
Fall-Time		t_F		-	186	-	ns
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=50V, I_D=1.3A (Note 1, 2)	-	57	-	nC
Gate to Source Charge		Q_{GS}		-	15.4	-	nC
Gate to Drain Charge		Q_{GD}		-	15.8	-	nC
Source-drain diode ratings and characteristics							
Maximum Body-Diode Continuous Current		I_S		-	-	16	A
Maximum Body-Diode Pulsed Current		I_{SM}		-	-	64	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=16A, V_{GS}=0V	-	-	1.4	V

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

■ TEST CIRCUITS AND WAVEFORMS

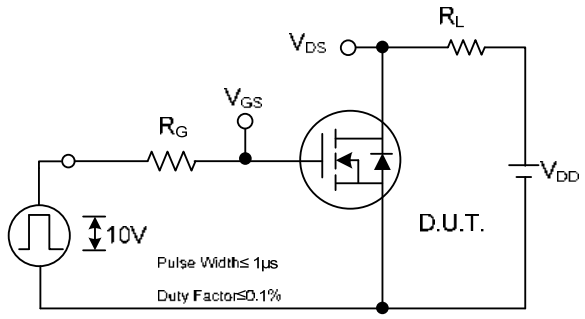


Peak Diode Recovery dv/dt Test Circuit

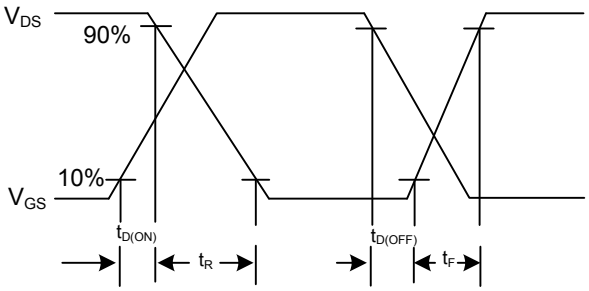


Peak Diode Recovery dv/dt Waveforms

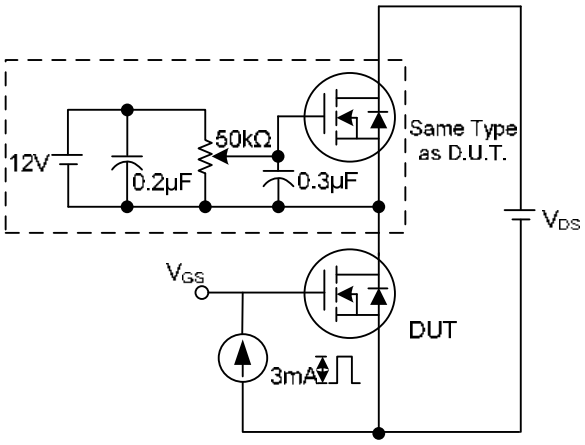
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



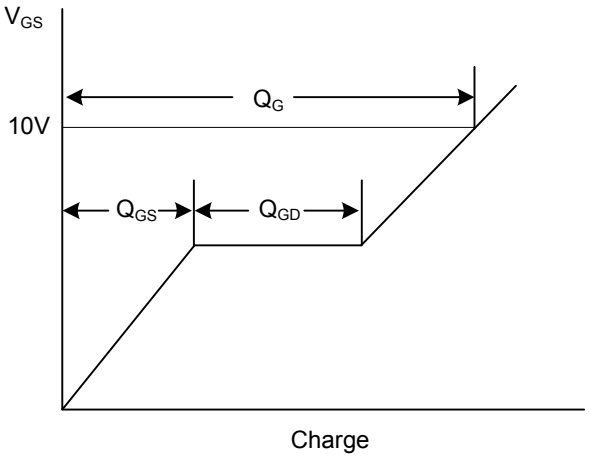
Switching Test Circuit



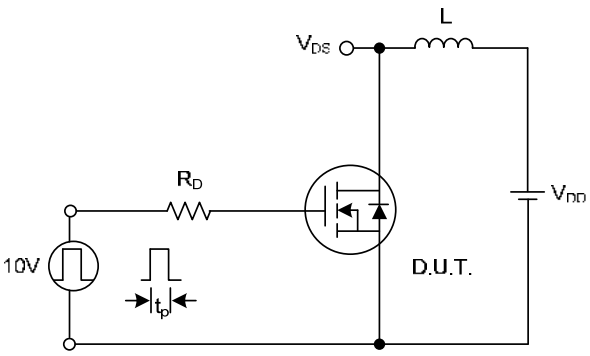
Switching Waveforms



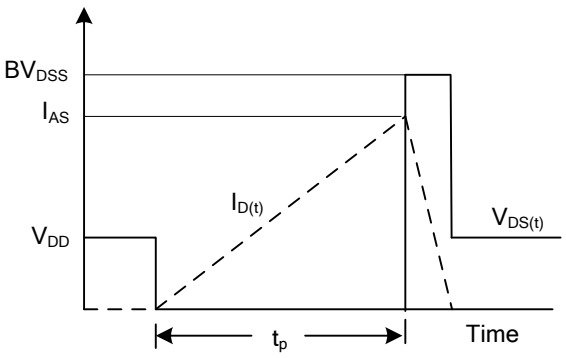
Gate Charge Test Circuit



Gate Charge Waveform

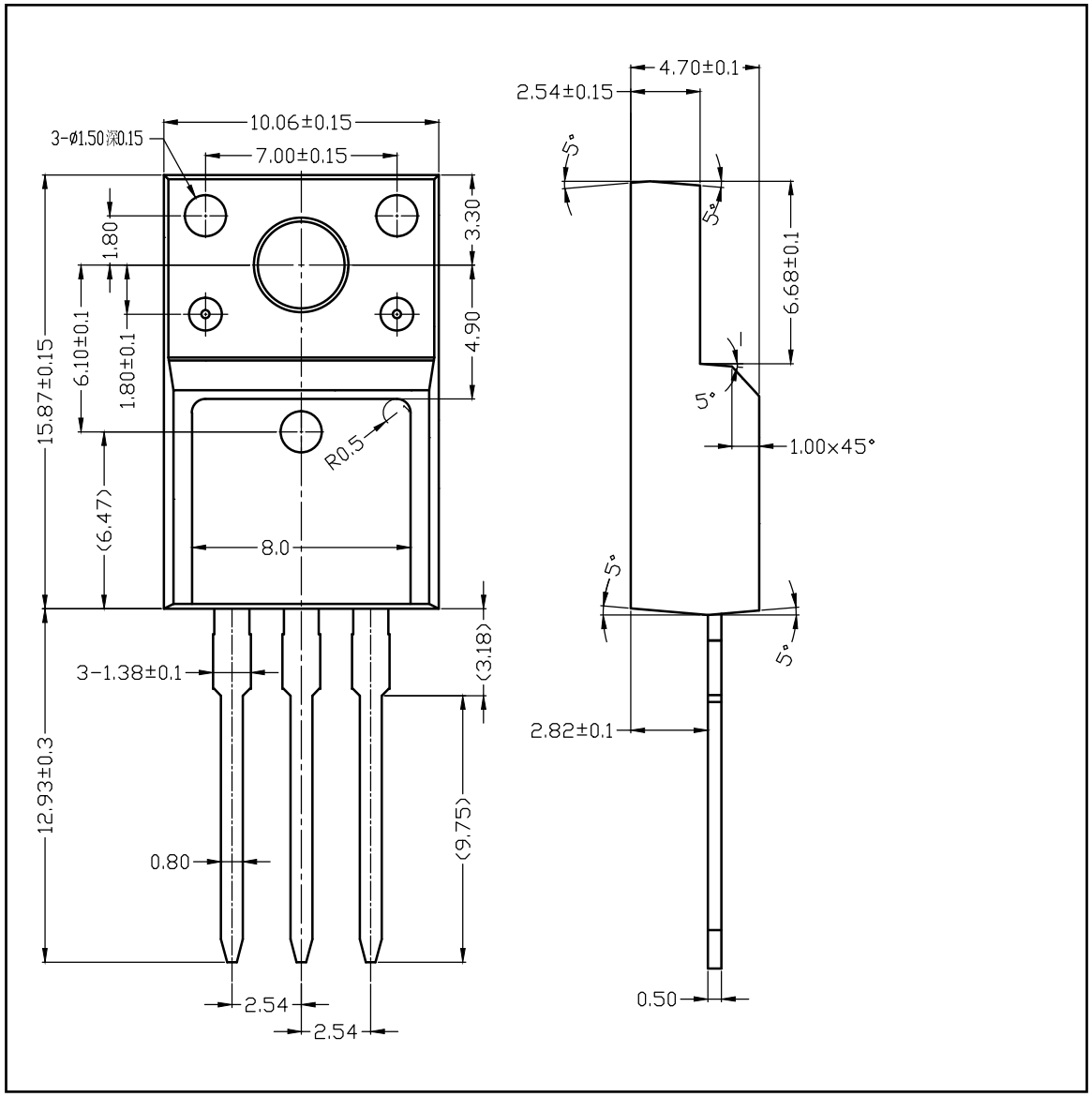


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS