

■ PRODUCT CHARACTERISTICS

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

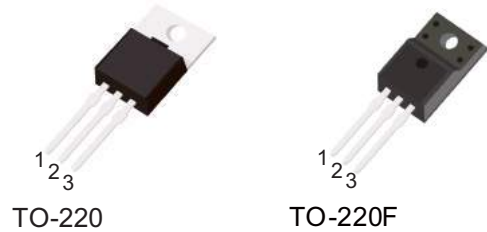
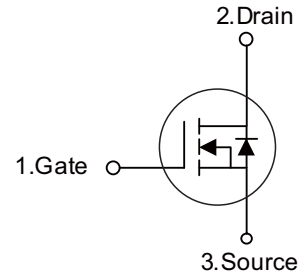
■ APPLICATIONS

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

■ FEATURES

- * High Switching Speed
- * 100% Avalanche Tested

Symbol



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GSS}	±30	V
Drain Current	Continuous ($T_C = 25^\circ\text{C}$)	16 (Note 2)	A
	Pulsed (Note 3)	64 (Note 2)	A
Avalanche Current (Note 3)	I_{AR}	16	A
Avalanche Energy	Single Pulsed (Note 4)	780	mJ
	Repetitive (Note 5)	20	mJ
Peak Diode Recovery dv/dt (Note 5)	dv/dt	4.5	V/ns
Power Dissipation	TO-220	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.

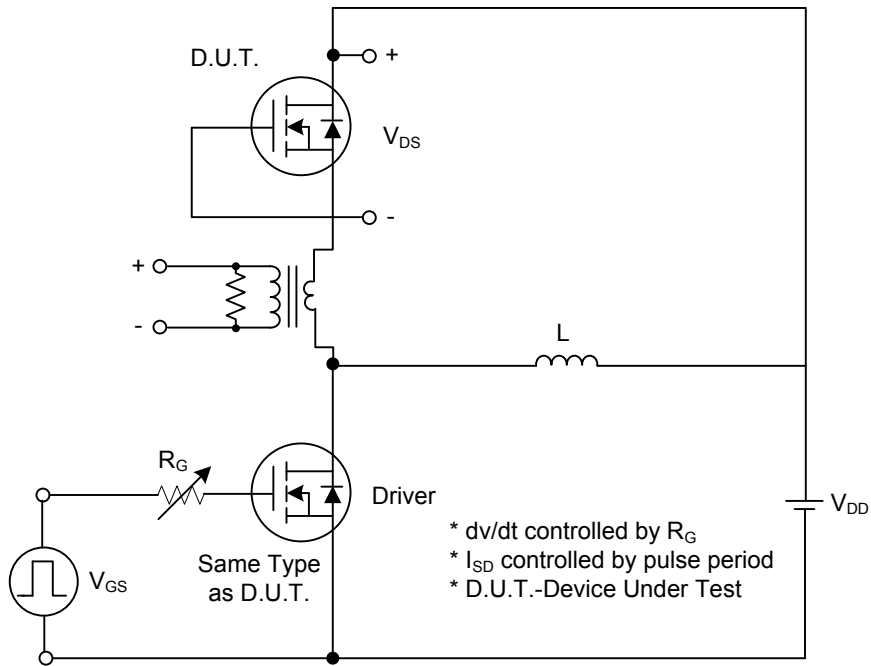
2. Drain current limited by maximum junction temperature
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4. $L = 6.1\text{mH}$, $I_{AS} = 16\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
5. $I_{SD} \leq 16\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

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

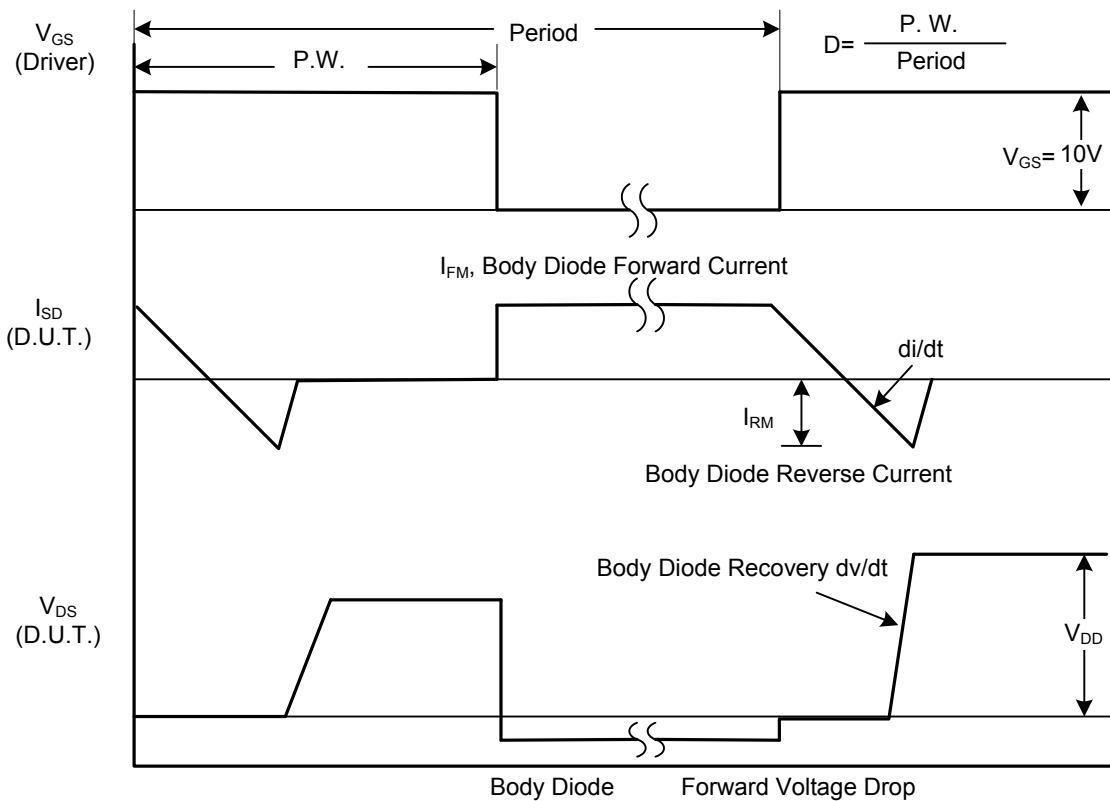
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	650	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
		$V_{DS}=520\text{V}$, $V_{GS}=0\text{V}$, $T_C=125^\circ\text{C}$	-	-	10	μA
Gate- Source Leakage Current	Forward	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$	-	-	+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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=8\text{A}$	-	0.55	0.6	Ω
Dynamic characteristics						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$	-	1078	-	pF
Output Capacitance	C_{OSS}		-	225	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	10	-	pF
Switching characteristics						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (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	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=1.3\text{A}$ (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}	$I_S=16\text{A}$, $V_{GS}=0\text{V}$	-	-	1.4	V

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

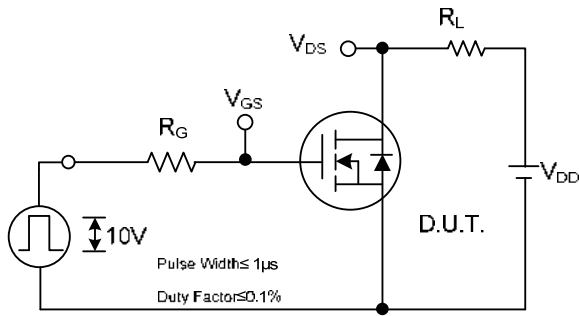


Peak Diode Recovery dv/dt Test Circuit

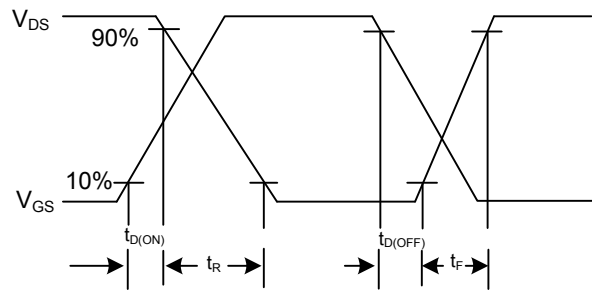


Peak Diode Recovery dv/dt Waveforms

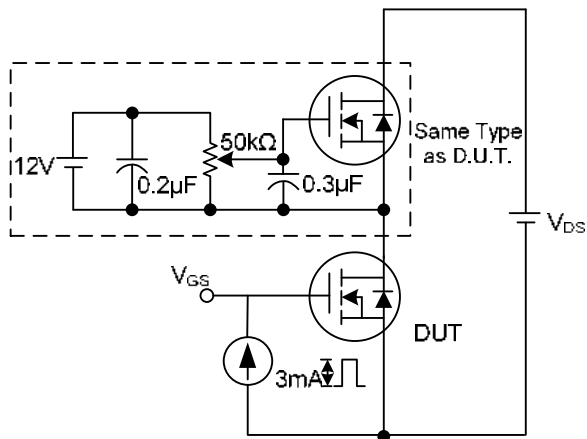
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



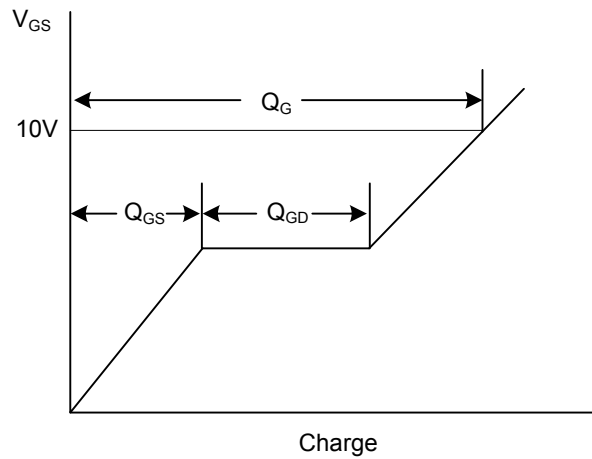
Switching Test Circuit



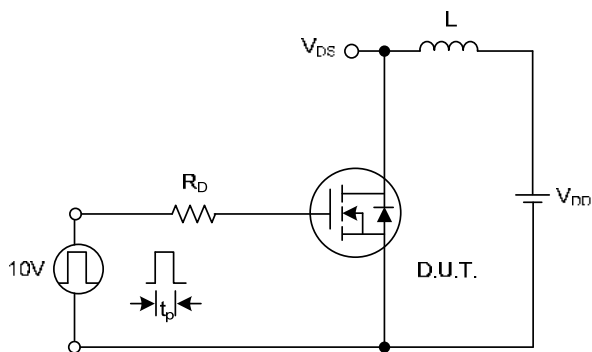
Switching Waveforms



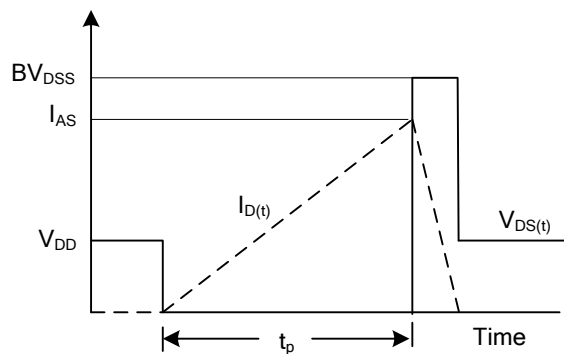
Gate Charge Test Circuit



Gate Charge Waveform

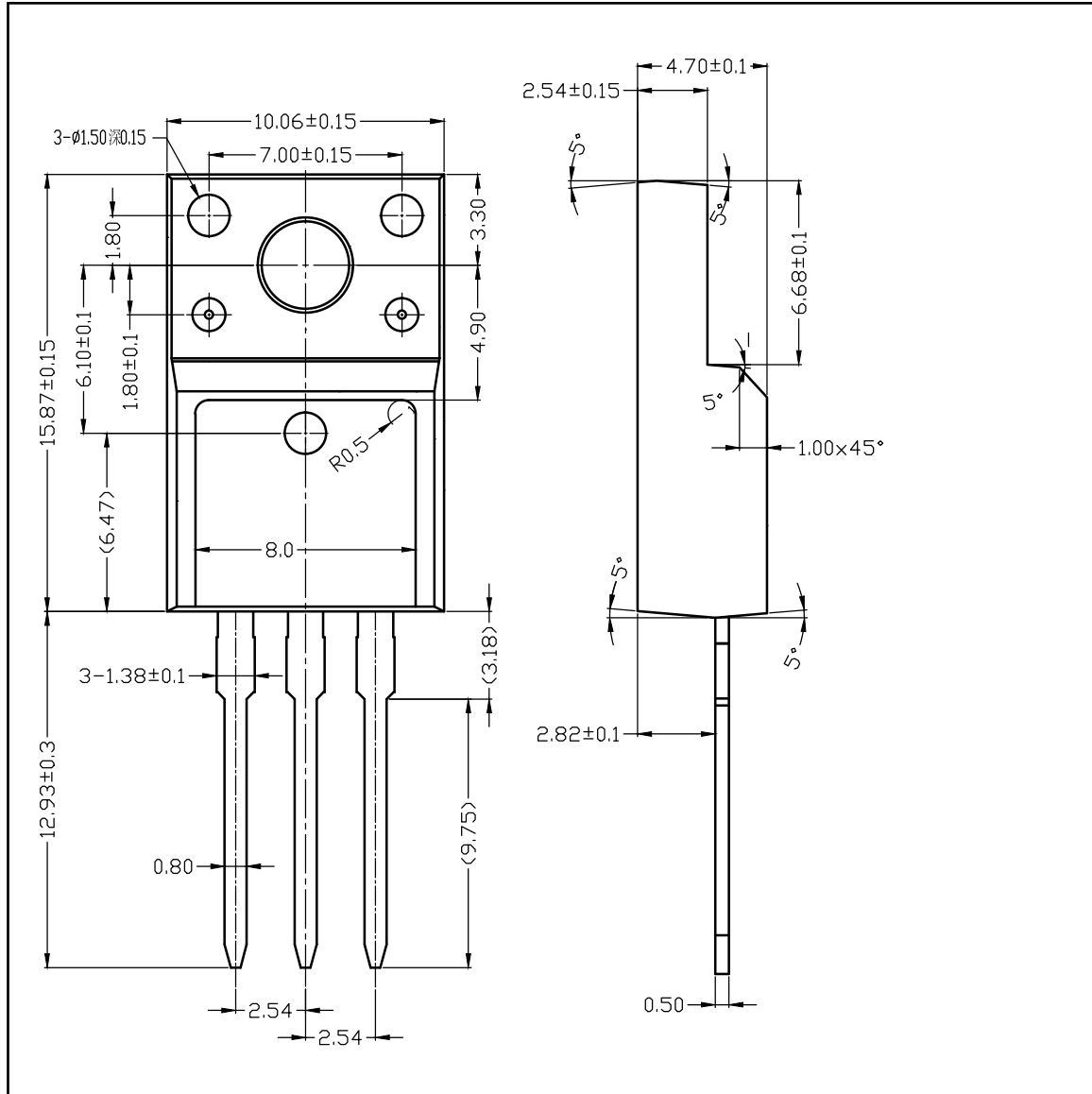


Unclamped Inductive Switching Test Circuit

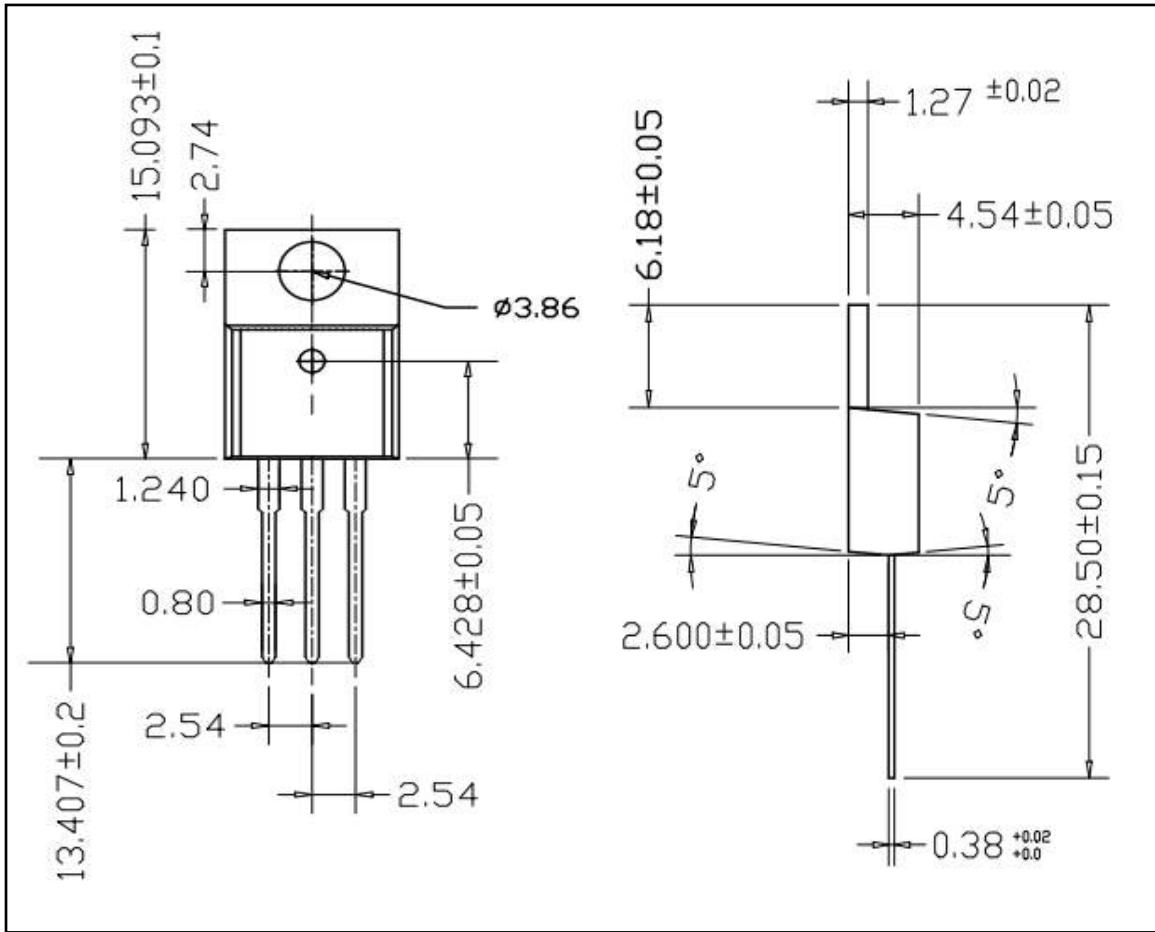


Unclamped Inductive Switching Waveforms

■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS



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