

■ PRODUCT CHARACTERISTICS

VDSS	650V
$R_{DS(on)max}(V_{GS}=10V)$	5Ω
Qg@type	14nC
ID	2A

■ APPLICATIONS

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

■ FEATURES

- * $R_{DS(ON)} < 5.0\Omega @ V_{GS} = 10V$
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2N65F	TO-220F	50 pieces/Tube
N/A	MOT2N65A	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
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	TO-251/TO-252	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.

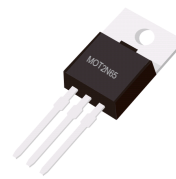
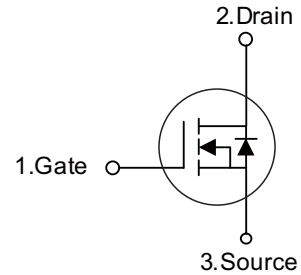
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by T_J .

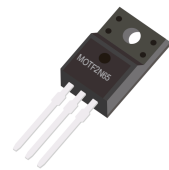
3. $L=55\text{mH}$, $I_{AS}=2.0\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 2.4\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

Symbol



TO-220



TO-220F

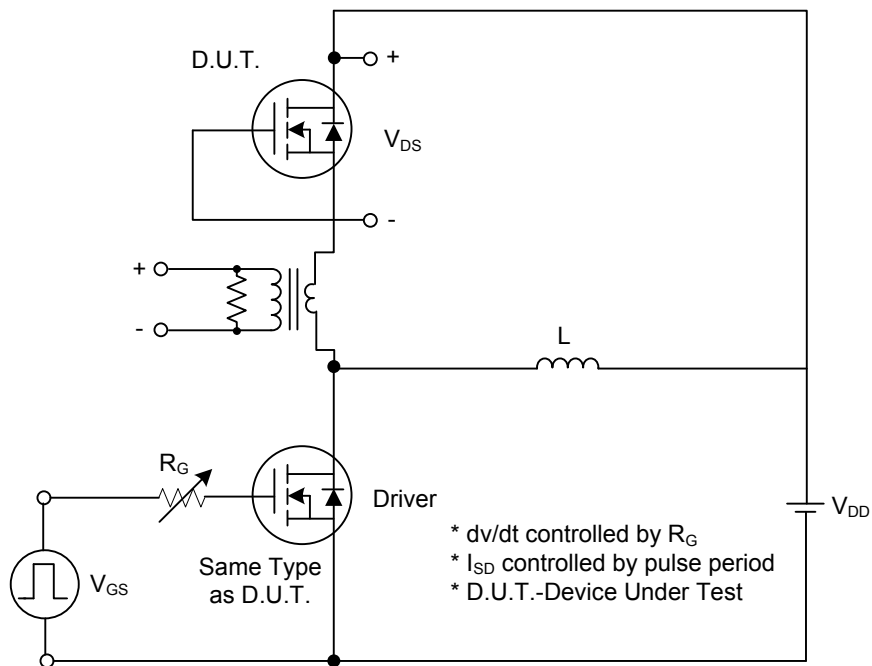


■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

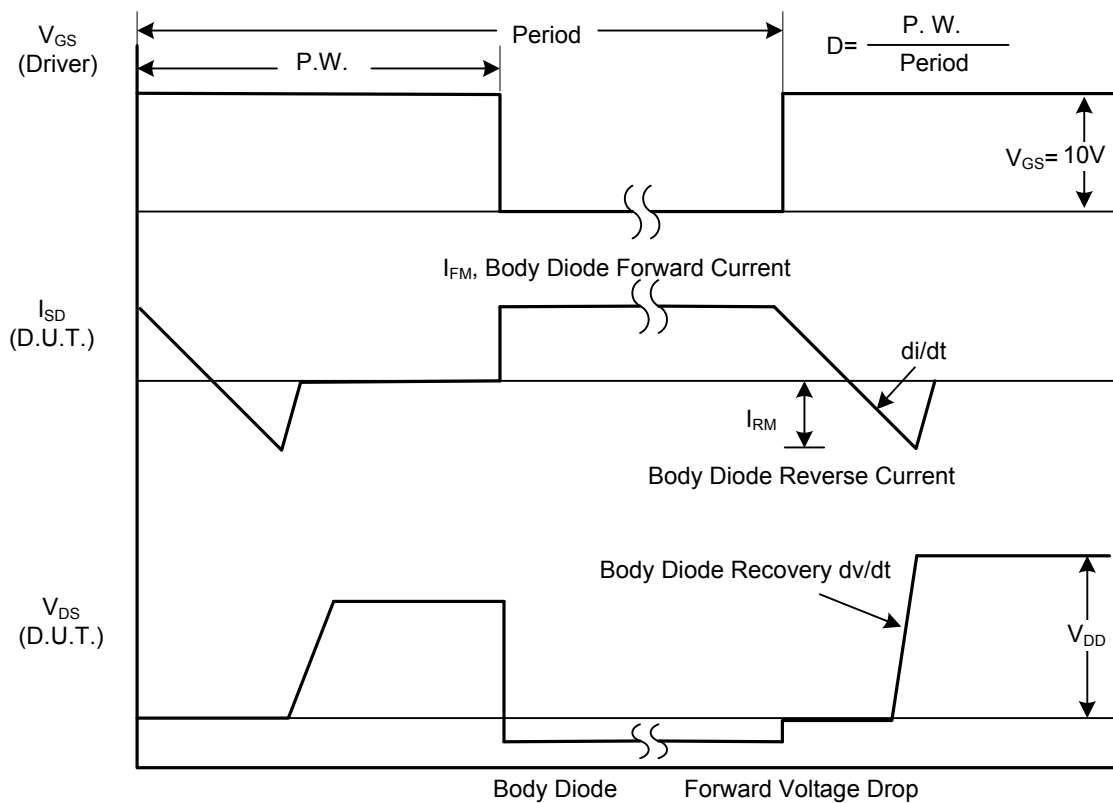
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30V, V _{DS} = 0V			100	nA
	Reverse		V _{GS} = -30V, V _{DS} = 0V			-100	nA
Breakdown Voltage Temperature Coefficient			△BV _{DSS} /△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		3.7	5.0	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f =1MHz		240	320	pF
Output Capacitance		C _{OSS}			33	45	pF
Reverse Transfer Capacitance		C _{RSS}			4.5	6	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		t _{D (ON)}	V _{DD} =30V, I _D =0.5A, R _G =25Ω (Note 1, 2)		40	60	ns
Turn-On Rise Time		t _R			40	60	ns
Turn-Off Delay Time		t _{D (OFF)}			50	70	ns
Turn-Off Fall Time		t _F			22	38	ns
Total Gate Charge		Q _G	V _{DS} =50V, V _{GS} =1.0V, I _D =1.3A (Note 1, 2)		12	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 $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature

TEST CIRCUITS AND WAVEFORMS

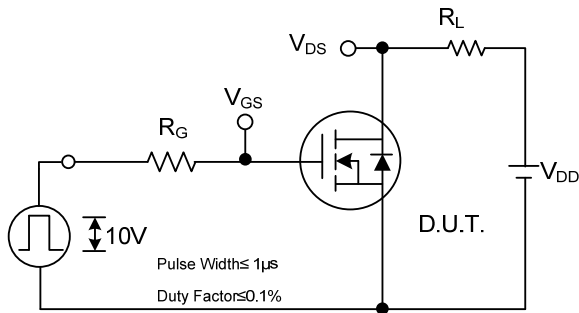


Peak Diode Recovery dv/dt Test Circuit

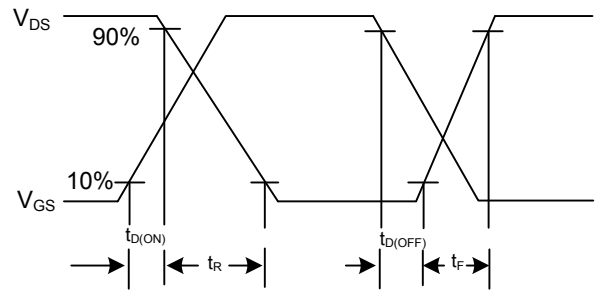


Peak Diode Recovery dv/dt Waveforms

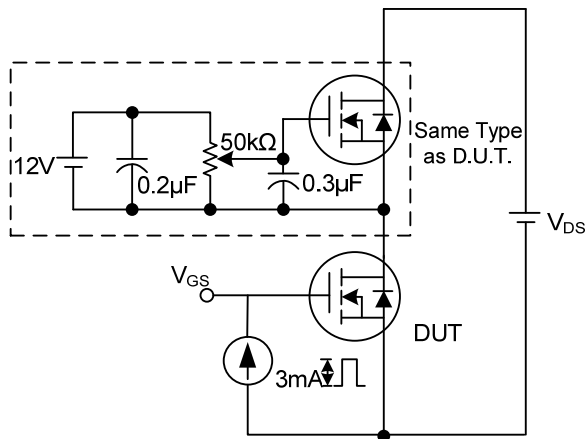
TEST CIRCUITS AND WAVEFORMS(Cont.)



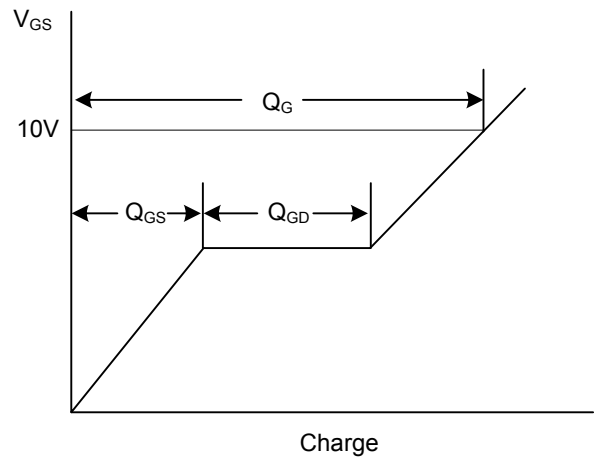
Switching Test Circuit



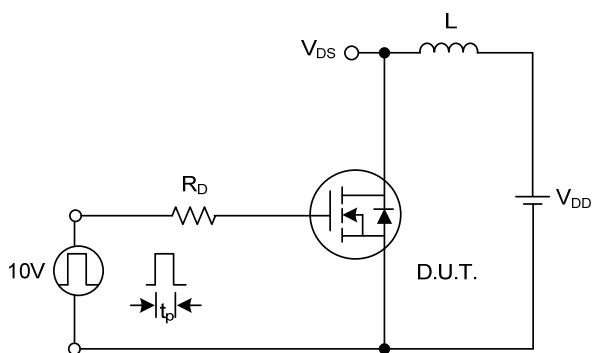
Switching Waveforms



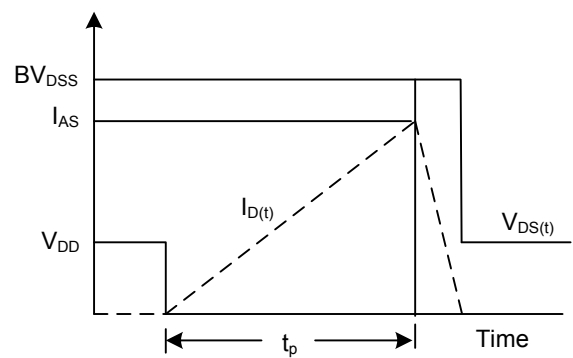
Gate Charge Test Circuit



Gate Charge Waveform

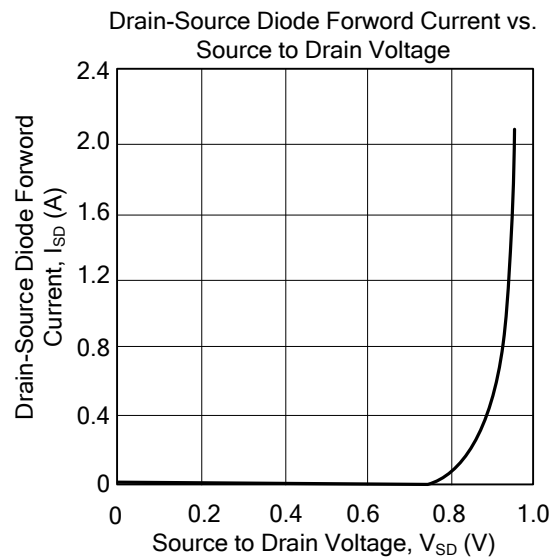
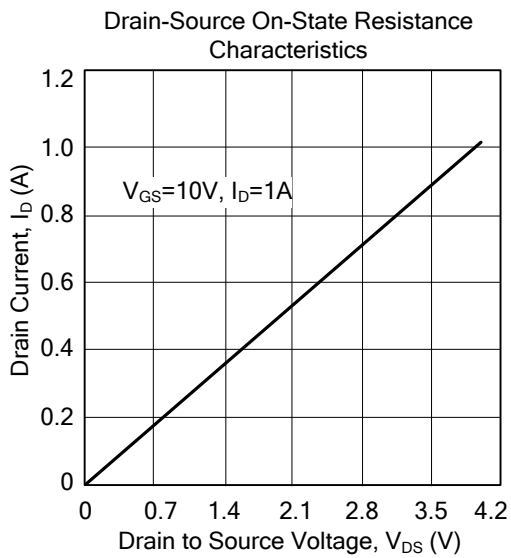
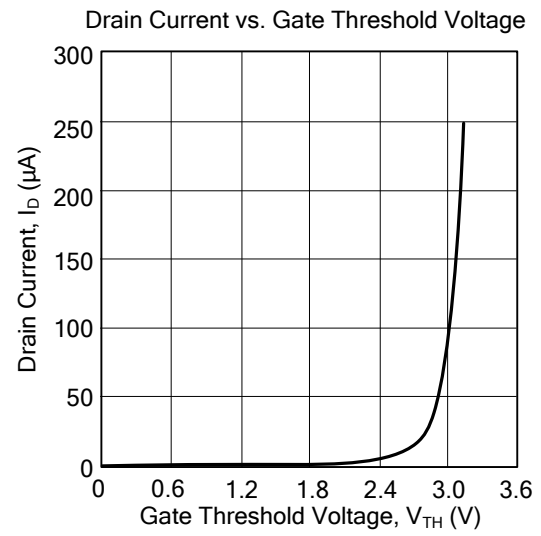
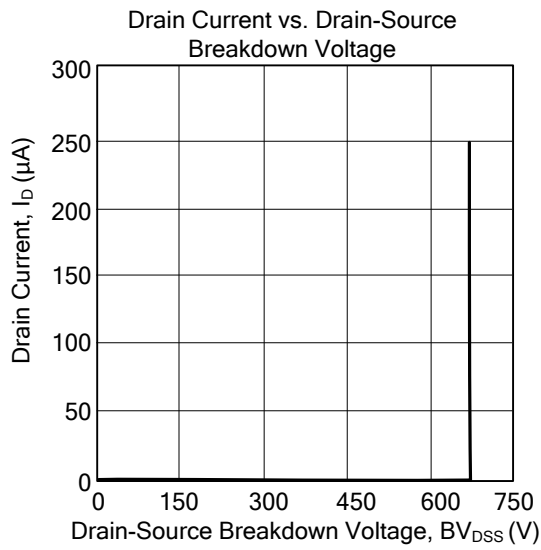


Unclamped Inductive Switching Test Circuit

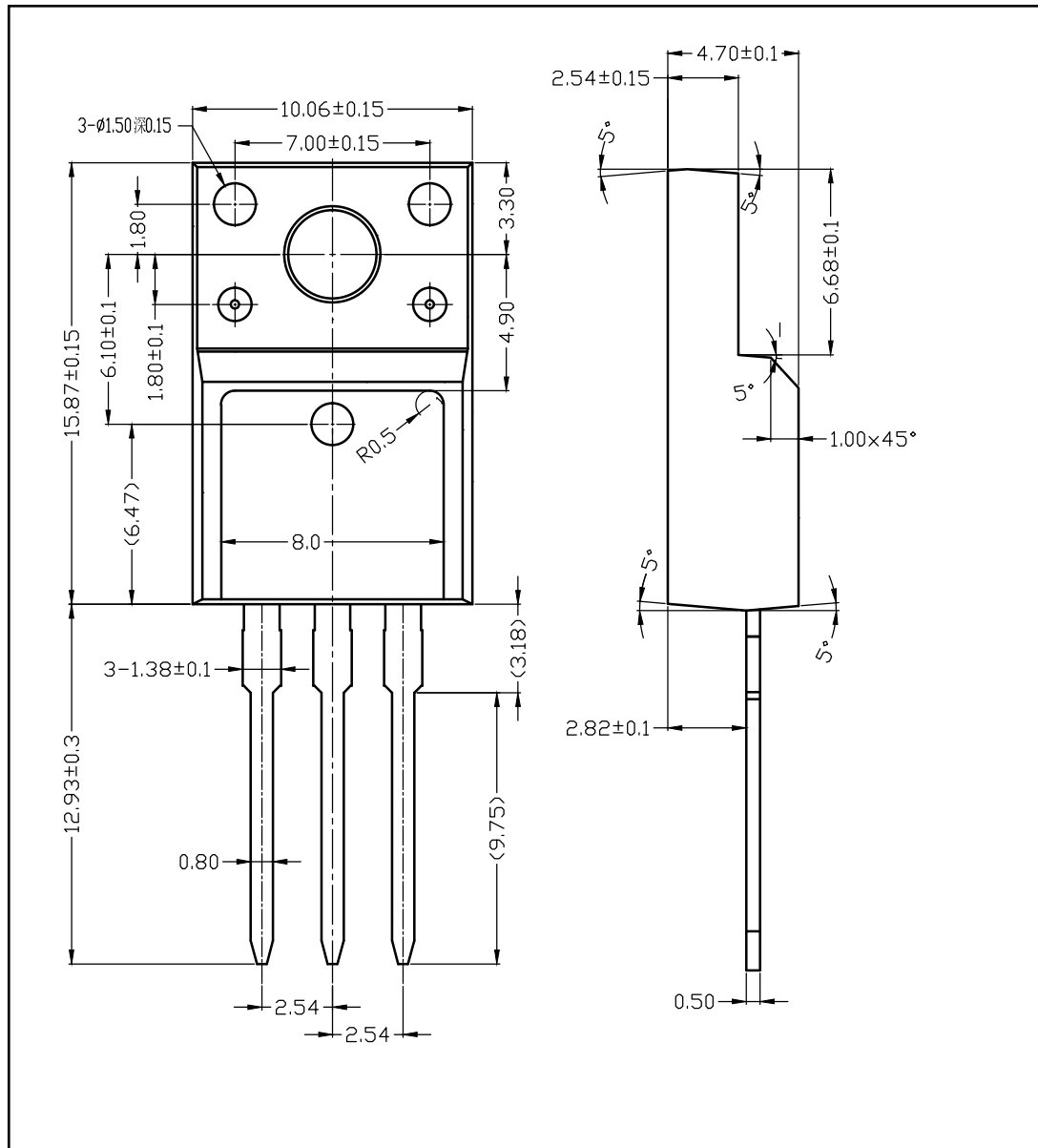


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

