

PRODUCT CHARACTERISTICS

VDSS	700V
$R_{DS(on)Typ}(V_{GS}=10V)$	2.6Ω
Qg@type	20nC
ID	4A

APPLICATIONS

- * High frequency switching mode power supply
- * Electronic ballast
- * LED power supplies

FEATURES

- * Ultra Low Gate Charge (Typical 15nC)
- * Low Reverse Transfer Capacitance (C_{RSS} = Typical 8.0 pF)
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4N70F	TO-220F	50 pieces/Tube
N/A	MOT4N70A	TO-220	50 pieces/Tube

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	700	V
Gate-Source Voltage		V _{GSS}	±30	V
Avalanche Current (Note 2)		I _{AR}	4.0	A
Drain Current	Continuous	I _D	4.0	A
	Pulsed (Note 2)	I _{DM}	17.6	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	216	mJ
	Repetitive (Note 2)	E _{AR}	10.6	mJ
Power Dissipation	TO-220F	P _D	36	W
	TO-220		106	W
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Junction Temperature		T _J	+150	°C
Operating Temperature		T _{OPR}	-55 ~ +150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

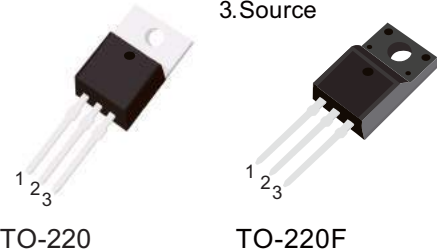
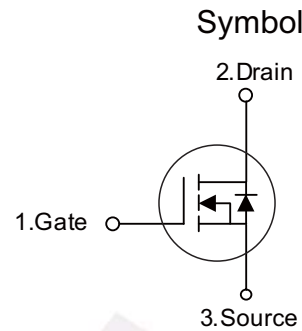
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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

2. Repetitive Rating : Pulse width limited by maximum junction temperature

3. L = 27mH, I_{AS} = 4 A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

4. I_{SD} ≤ 4.0A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C



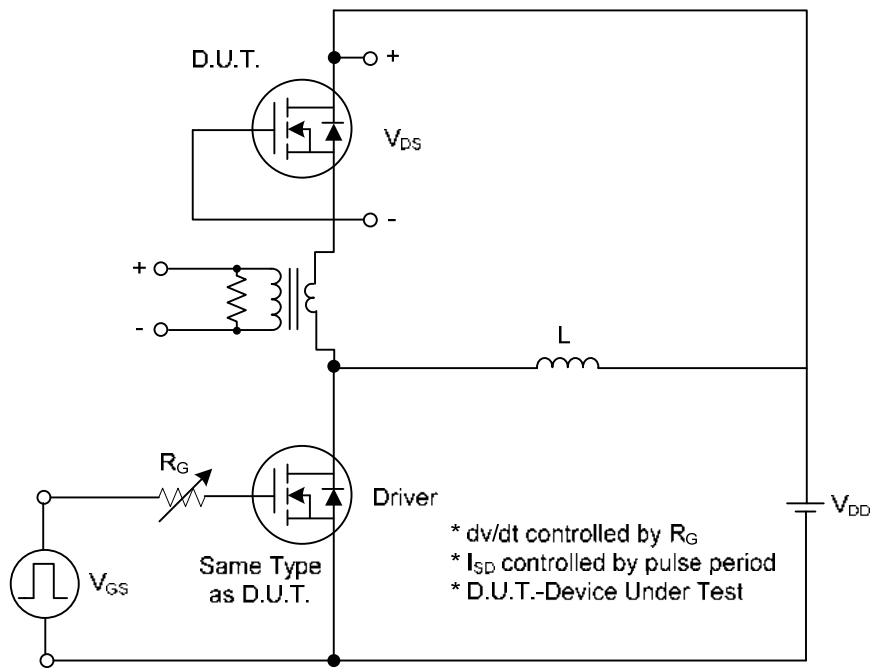
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0 V, I _D = 250 μA	700	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 700 V, V _{GS} = 0 V	-	-	10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30 V, V _{DS} = 0 V	-	-	100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0 V	-	-	-100	
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D = 250μA, Referenced to 25°C	-	0.6	-	V/°C
On characteristics							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250 μA	2.0	-	4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} = 10 V, I _D = 2A	-	2.6	2.8	Ω
Dynamic characteristics							
Input Capacitance		C _{ISS}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1MHz	-	520	-	pF
Output Capacitance		C _{OSS}		-	70	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	8	-	pF
Switching characteristics							
Turn-On Delay Time		t _{D(ON)}	V _{DD} = 350V, I _D = 4A, R _G = 25Ω (Note 1, 2)	-	13	-	ns
Turn-On Rise Time		t _R		-	45	-	ns
Turn-Off Delay Time		t _{D(OFF)}		-	25	-	ns
Turn-Off Fall Time		t _F	V _{DS} = 560V, I _D = 4A, V _{GS} = 10 V (Note 1, 2)	-	35	-	ns
Total Gate Charge		Q _G		-	15	-	nC
Gate-Source Charge		Q _{GS}		-	3.4	-	nC
Gate-Drain Charge		Q _{GD}		-	7.1	-	nC
Source-drain diode ratings and characteristics							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} = 0 V, I _S = 4A	-	-	1.4	V
Maximum Continuous Forward Current		I _S		-	-	4	A
Maximum Pulsed Forward Current		I _{SM}		-	-	16	A
Reverse Recovery Time		t _{rr}	V _{GS} = 0 V, I _S = 4 A,	-	250	-	ns
Reverse Recovery Charge		Q _{RR}	dI/dt = 100 A/μs (Note 1)	-	1.5	-	μC

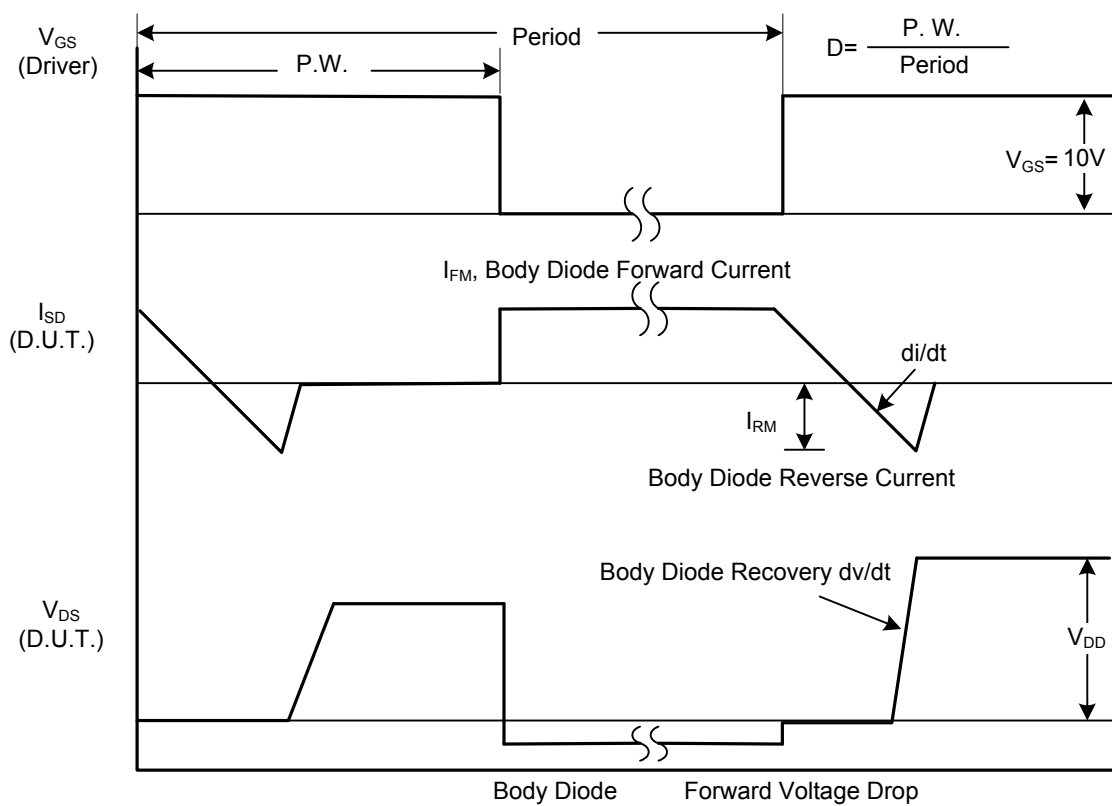
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

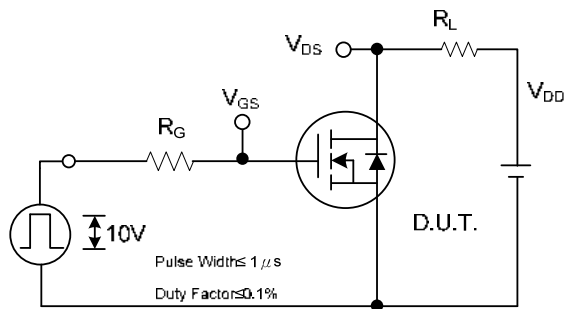


Peak Diode Recovery dv/dt Test Circuit

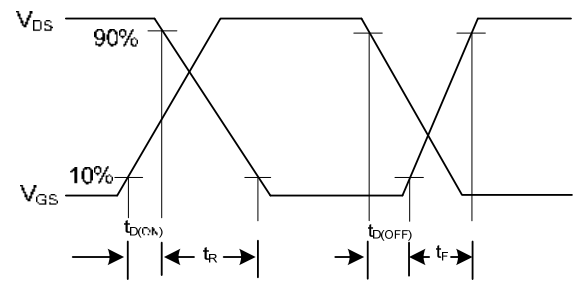


Peak Diode Recovery dv/dt Waveforms

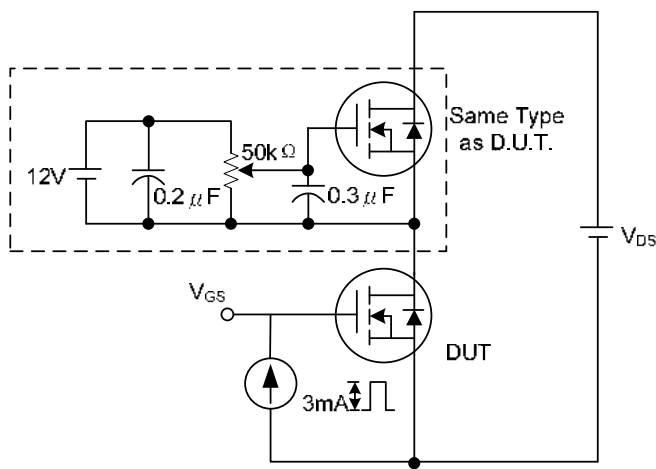
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



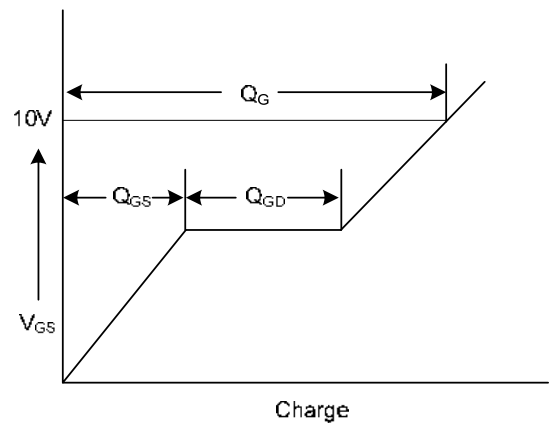
Switching Test Circuit



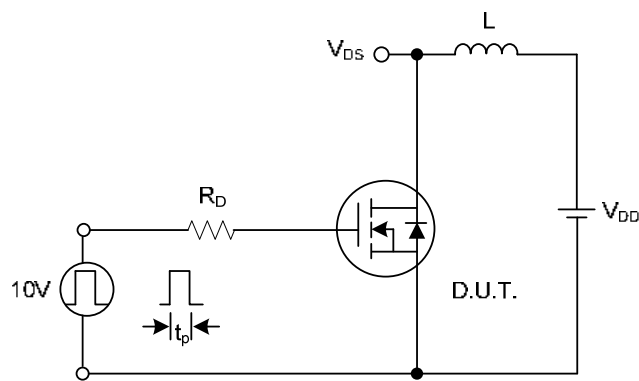
Switching Waveforms



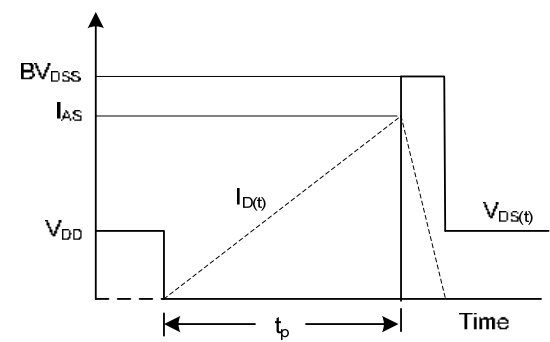
Gate Charge Test Circuit



Gate Charge Waveform

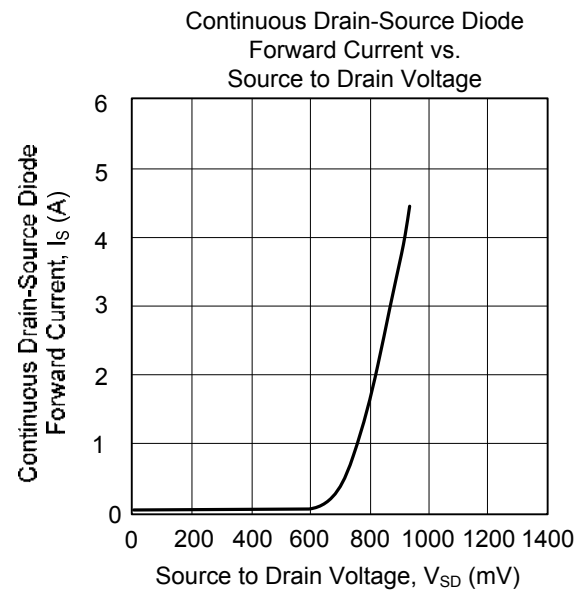
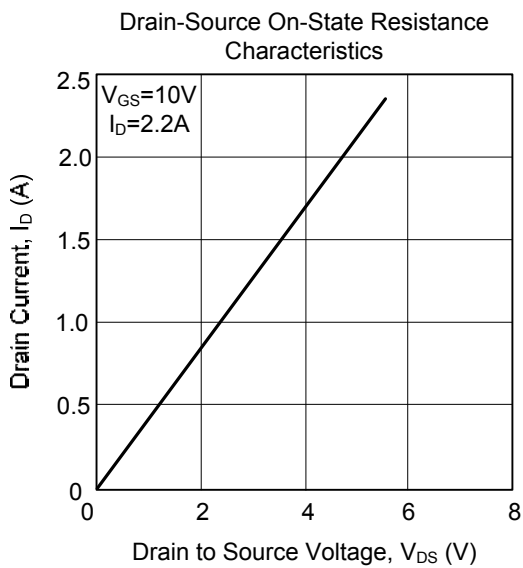
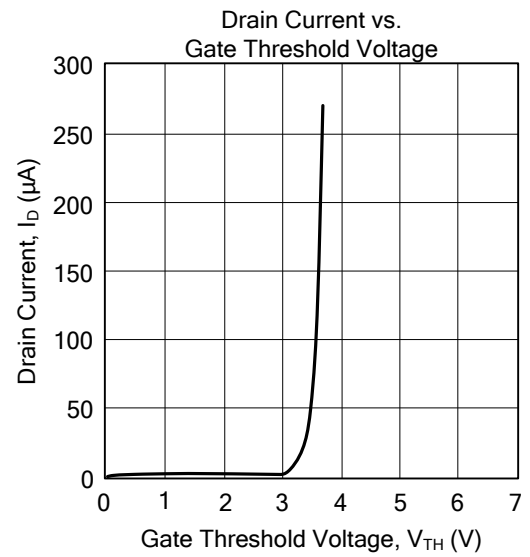
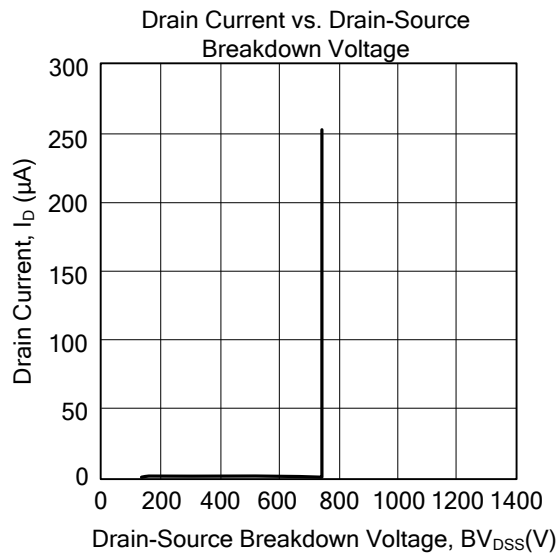


Unclamped Inductive Switching Test Circuit

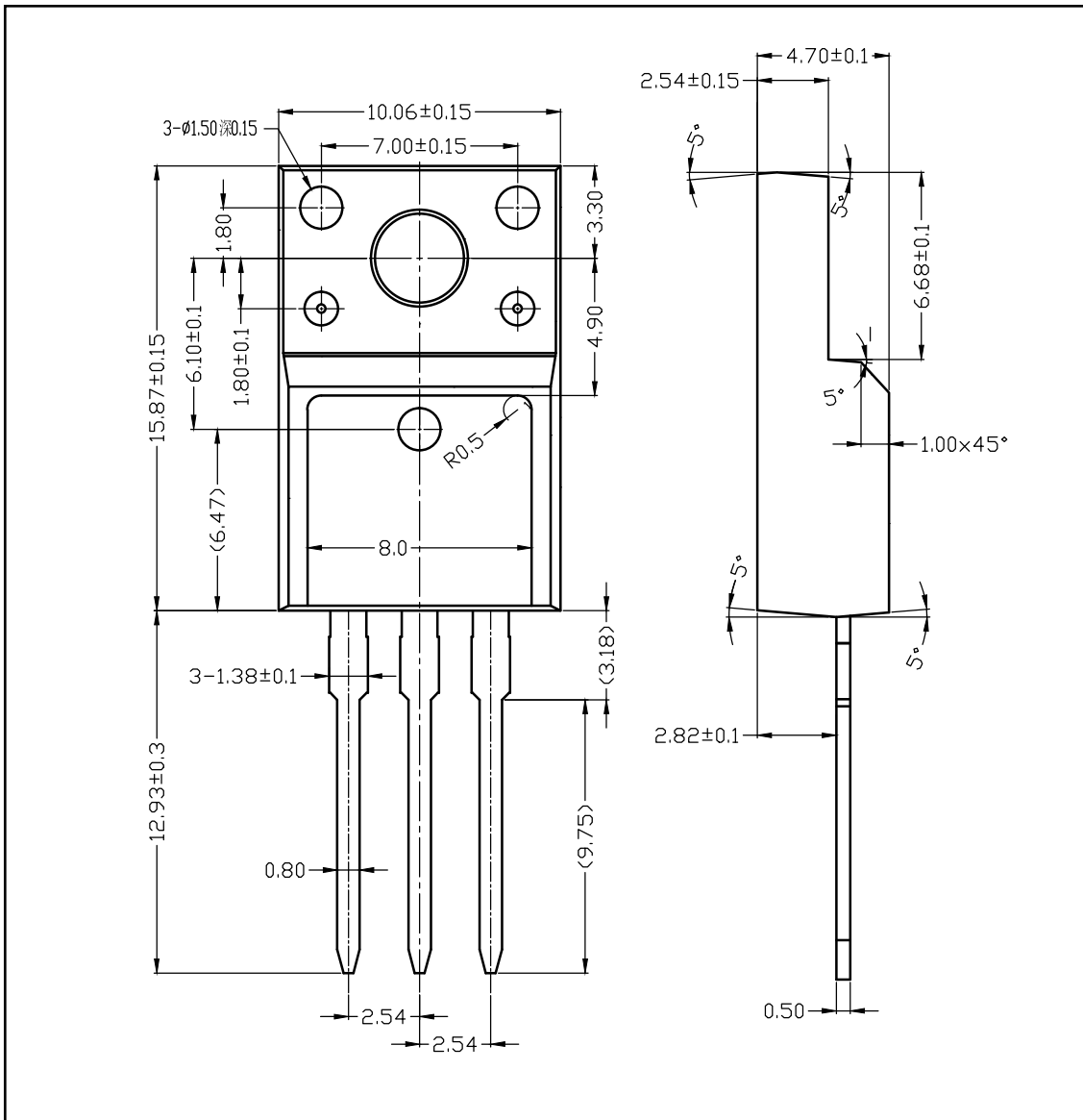


Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

