

PRODUCT CHARACTERISTICS

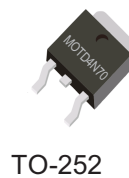
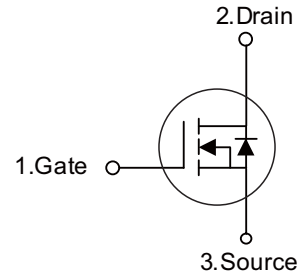
VDSS	700V
$R_{DS(on)max}(@V_{GS} = 10\text{ V})$	2.8Ω
Qg@type	20nC
ID	4A

APPLICATIONS

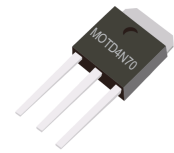
- * High frequency switching mode power supply
- * Electronic ballast
- * LED power supplies

FEATURES

- * $R_{DS(ON)} < 2.8\Omega @ V_{GS} = 10\text{ V}$
- * Ultra Low Gate Charge (Typical 15nC)
- * Low Reverse Transfer Capacitance ($C_{RSS} = \text{Typical } 8.0\text{ pF}$)
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

Symbol


TO-252



TO-251

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4N70C	TO-251	70 pieces/Tube
N/A	MOT4N70D	TO-252	2500 pieces/Reel

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, 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	A
Drain Current	Continuous	I_D	4
	Pulsed (Note 2)	I_{DM}	16
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	260
	Repetitive (Note 2)	E_{AR}	10.6
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-251/ TO-252	P_D	49
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. $L = 26.9\text{mH}$, $I_{AS} = 4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

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

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-251/ TO-252	θ_{JA}	110
Junction to Case	TO-251/ TO-252	θ_{JC}	2.55

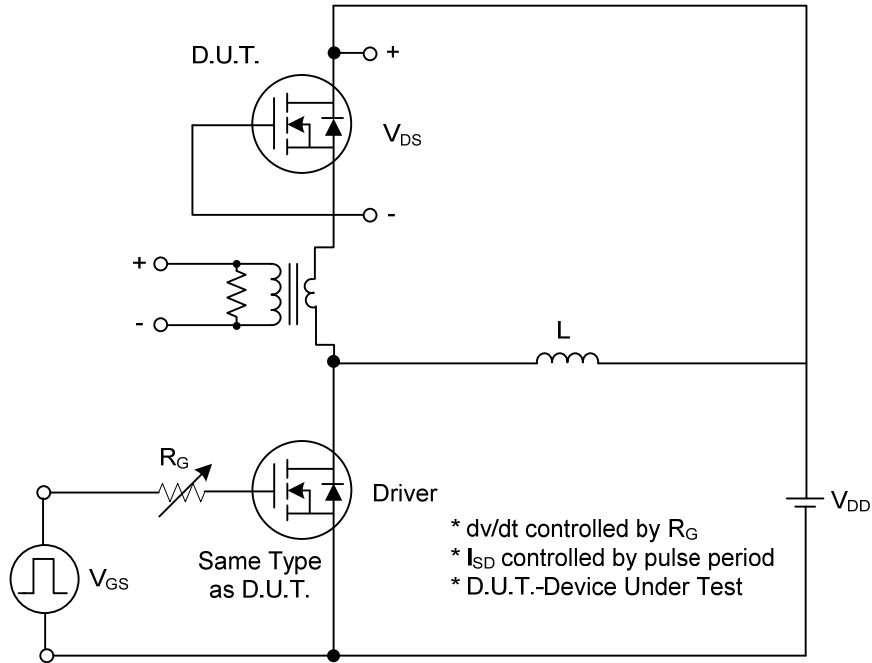


■ ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

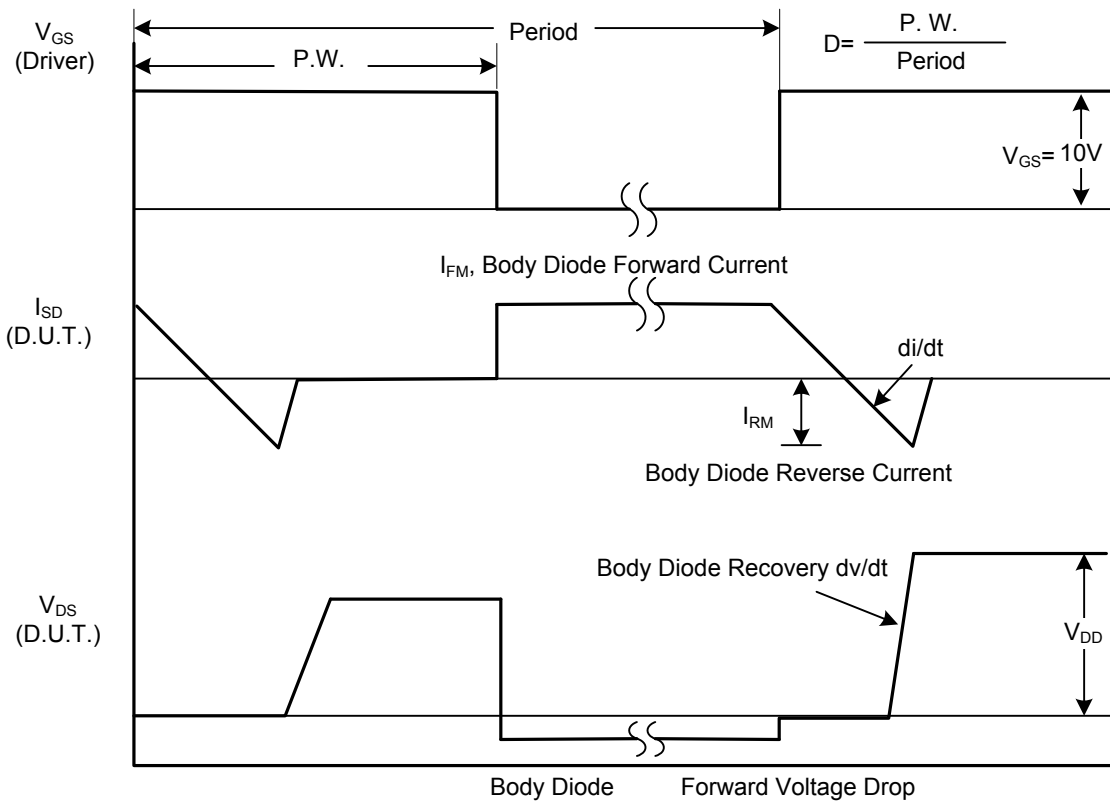
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250 μA	700			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 700 V, V _{GS} = 0 V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS} V _{GS} = 30 V, V _{DS} = 0 V			100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0 V			
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	670	pF
Output Capacitance	C _{OSS}			70	90	pF
Reverse Transfer Capacitance	C _{RSS}			8	11	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 350V, I _D = 4A, R _G = 25Ω (Note 1, 2)		13	35	ns
Turn-On Rise Time	t _R			45	100	ns
Turn-Off Delay Time	t _{D(OFF)}			25	60	ns
Turn-Off Fall Time	t _F			35	80	ns
Total Gate Charge	Q _G	V _{DS} = 560V, I _D = 4A, V _{GS} = 10 V (Note 1, 2)		15	20	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 Drain-Source Diode Forward Current	I _S				4	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				16	A
Reverse Recovery Time	t _{rr}	V _{GS} = 0 V, I _S = 4 A, dI/dt = 100 A/μs (Note 1)		250		ns
Reverse Recovery Charge	Q _{RR}				1.5	

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

■ TEST CIRCUITS AND WAVEFORMS

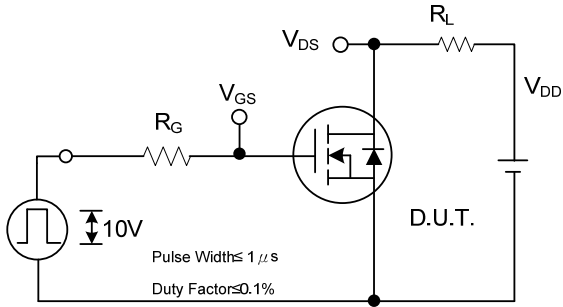


Peak Diode Recovery dv/dt Test Circuit

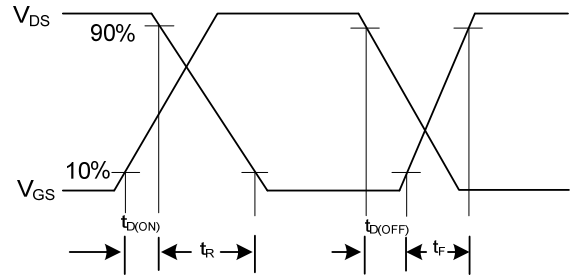


Peak Diode Recovery dv/dt Waveforms

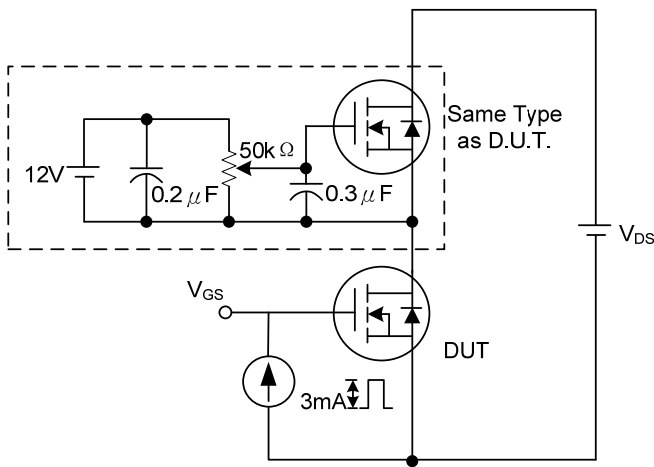
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



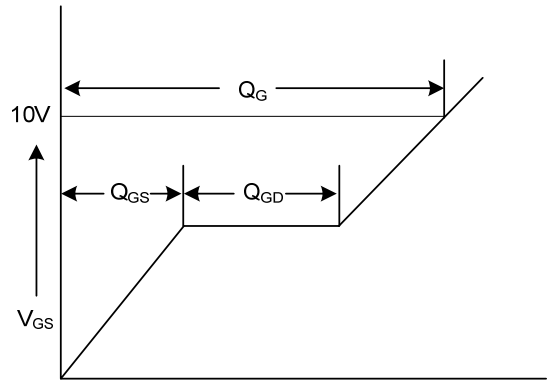
Switching Test Circuit



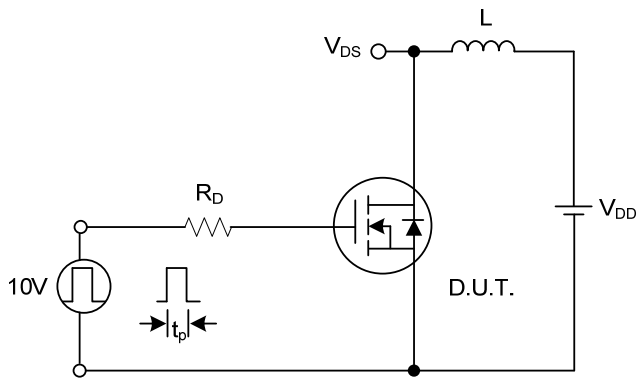
Switching Waveforms



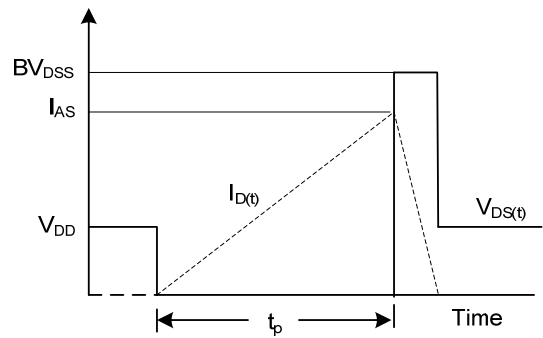
Gate Charge Test Circuit



Charge
Gate Charge Waveform

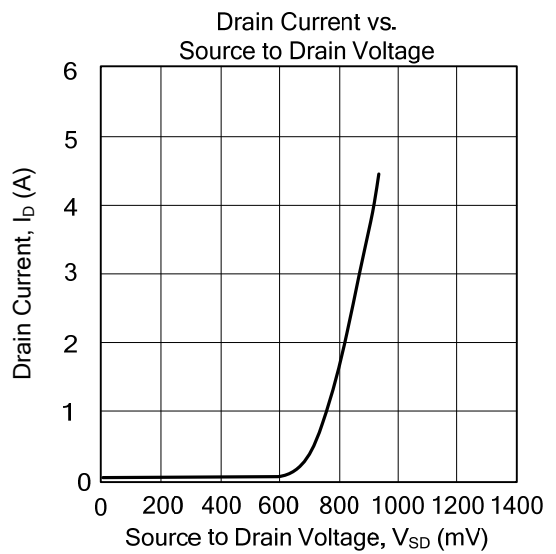
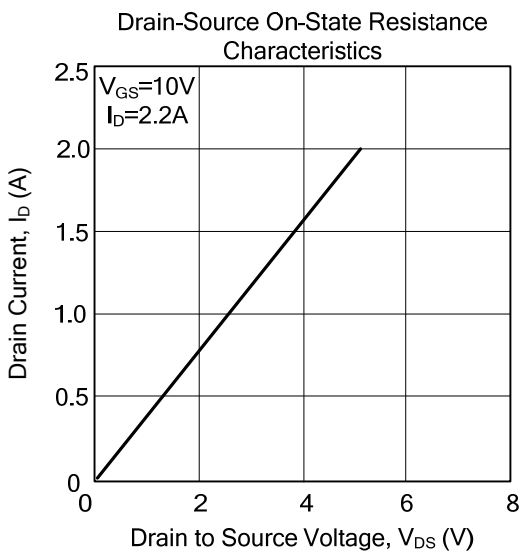
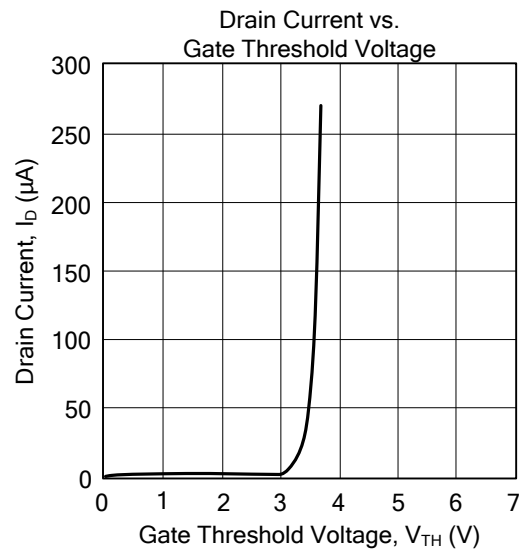
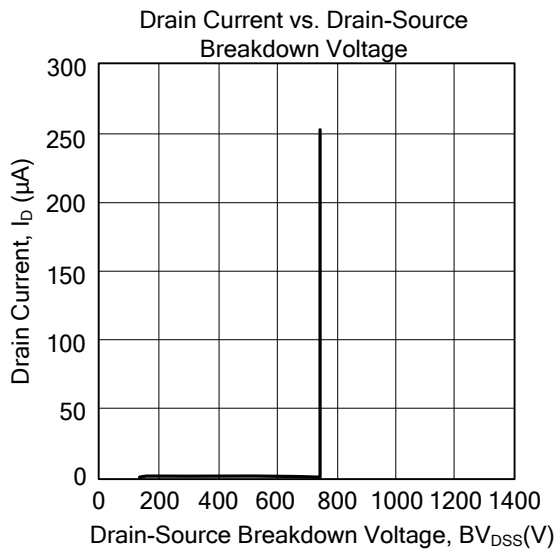


Unclamped Inductive Switching Test Circuit

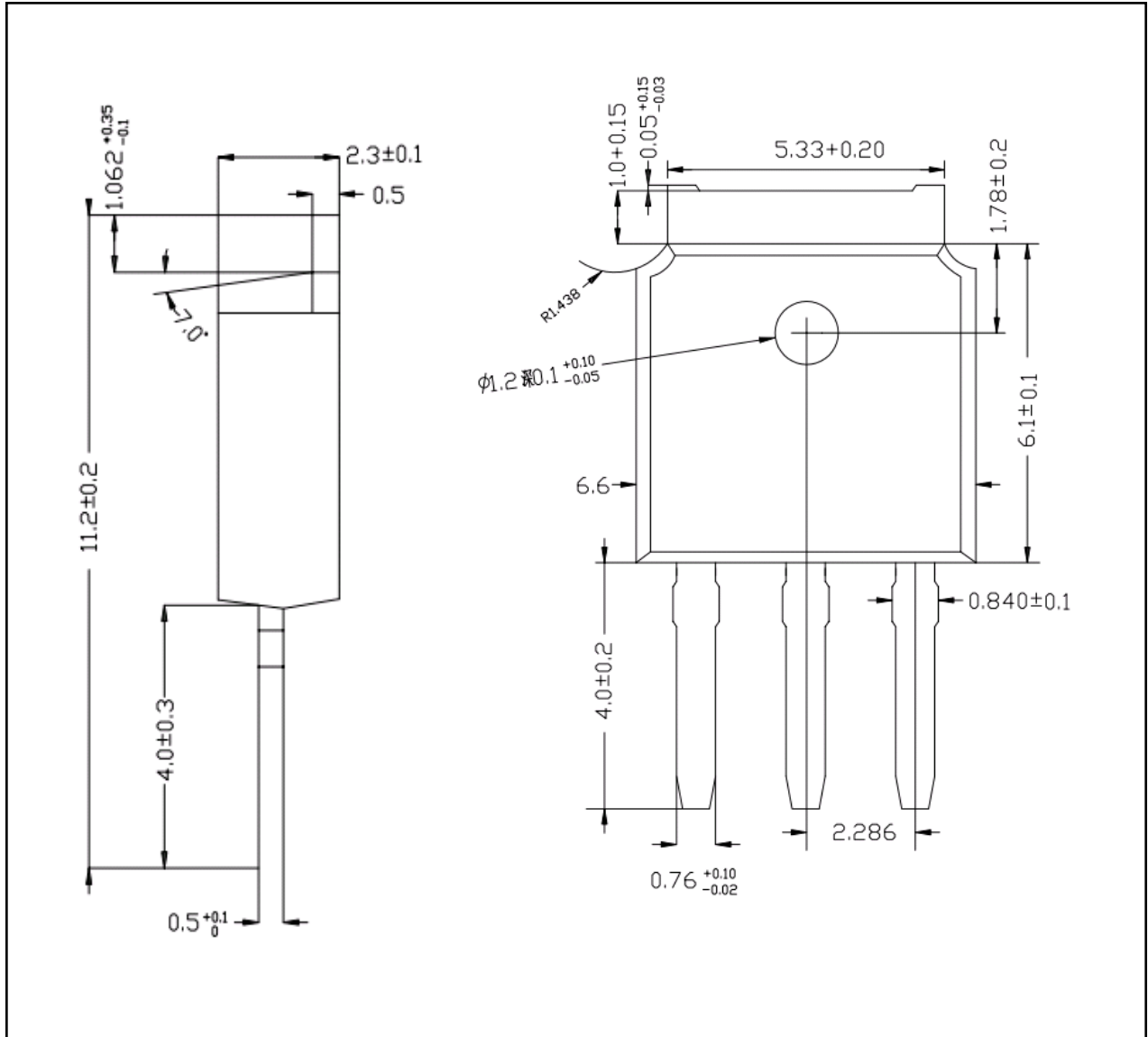


Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



■ TO-251F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-252F-2L PACKAGE OUTLINE DIMENSIONS

