

MSF2N70

N-Channel 700V MOSFET

Description

The MSF2N70 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The ITO-220AB package is universally preferred for all commercial-industrial applications

Features

- 100% EAS Test
- Rugged Gate Oxide Technology
- Extremely Low Intrinsic Capacitances
- Remarkable Switching Characteristics
- Unequalled Gate Charge: 10.5 nC (Typ.)
- Extended Safe Operating Area
- Lower RDS(ON) : 5.5 Ω (Typ.) @VGS=10V
- RoHS compliant package

Application

- Adapter
- Switching Mode Power Supply

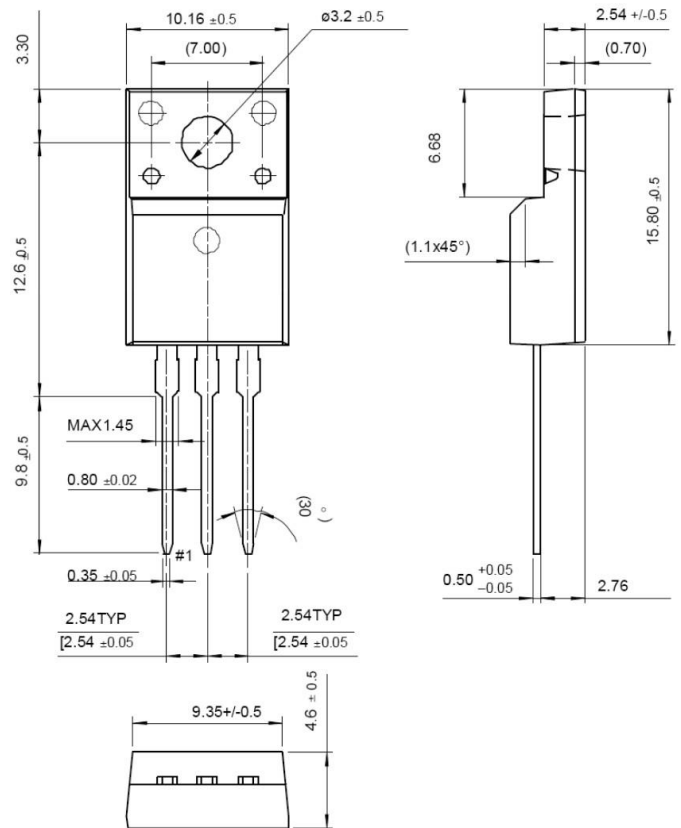
Package type : ITO-220AB

Packing & Order Information

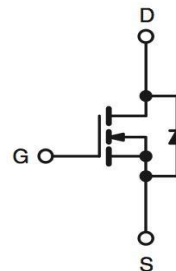
50/Tube ; 1,000/Box



RoHS
COMPLIANT



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	700	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current -Continuous (TC=25°C)	1.6	A
	Drain Current -Continuous (TC=100°C)	1.0	A
I _{DM}	Pulsed Drain Current	6.0	A
E _{AS}	Single Pulsed Avalanche Energy	140	mJ
E _{AR}	Repetitive Avalanche Energy	4.4	mJ
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns

MSF2N70

N-Channel 700V MOSFET

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
P _D	Power Dissipation (TC=25°C)	45	W
	Power Dissipation (TC=100°C)	0.22	W/°C
T _J ,T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C

NOTE:

1. Repetitive rating; pulse width limited by maximum junction temperature.

Thermal characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
R _{thjc}	Typical thermal resistance	2.7	°C/W
R _{θJA}	Typical thermal resistance	62.5	

Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
V _{GS}	V _{DS} = V _{GS} , I _D = 250μA	2.0	--	4.0	V
*R _{DS(ON)}	V _{GS} = 10 V, I _D = 0.8 A	--	5.5	6.0	Ω
BV _{DSS}	V _{GS} = 0 V, I _D = 250μA	700	--	--	V
ΔBV _{DSS} / ΔT _J	I _D = 250μA, Referenced to 25°C	--	0.7	--	V/°C
I _{DSS}	V _{DS} = 700 V, V _{GS} = 0 V V _{DS} = 560 V, V _{GS} = 0 V, T _J = 125°C	--	--	10 100	μA
I _{GSSF}	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-100	nA

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
C _{ISS}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0MHz	--	340	445	pF
C _{OSS}		--	45	60	pF
C _{RSS}		--	7.5	10	pF
t _{d(on)}	V _{DS} = 350 V, I _D = 1.6 A, R _G = 25 Ω	--	10	20	ns
t _r		--	25	50	ns
t _{d(off)}		--	20	40	ns
t _f		--	25	50	ns
Q _g	V _{DS} = 560 V, I _D = 1.6 A, V _{GS} = 10 V	--	10.5	1414	nC
Q _{gs}		--	2.0	--	
Q _{gd}		--	4.0	--	

MSF2N70

N-Channel 700V MOSFET

Source-Drain Diode Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
I_S		--	--	1.6	A
I_{SM}		--	--	6	
V_{SD}	$I_S = 1.6 \text{ A}, V_{GS} = 0 \text{ V}$	--	--	1.5	V
t_{rr}	$I_S = 1.6 \text{ A}, V_{GS} = 0 \text{ V}$	--	250	--	ns
Q_{rr}	$diF/dt=100A/\mu s$	--	1.2	--	μC

Notes ;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS}=1.6A, V_{DD}=50V, R_G=25W$, Starting $T_J=25^\circ C$
3. $I_{SD} \leq 1.6A, di/dt \leq .00A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
4. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

MSF2N70

N-Channel 700V MOSFET

■ Characteristics Curve

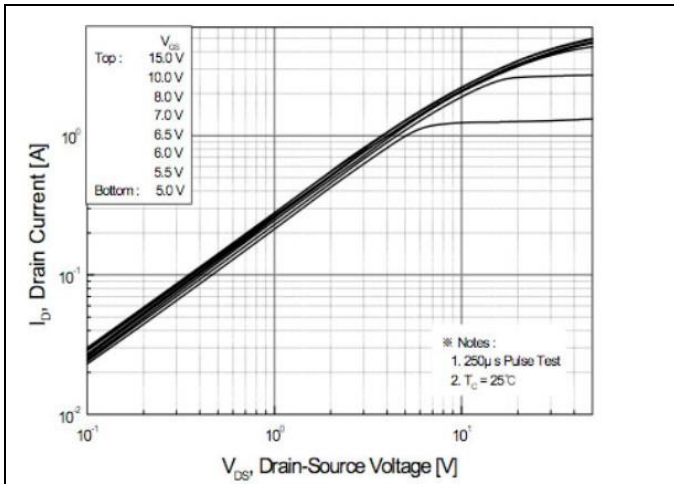


FIG.1-ON REGION CHARACTERISTICS

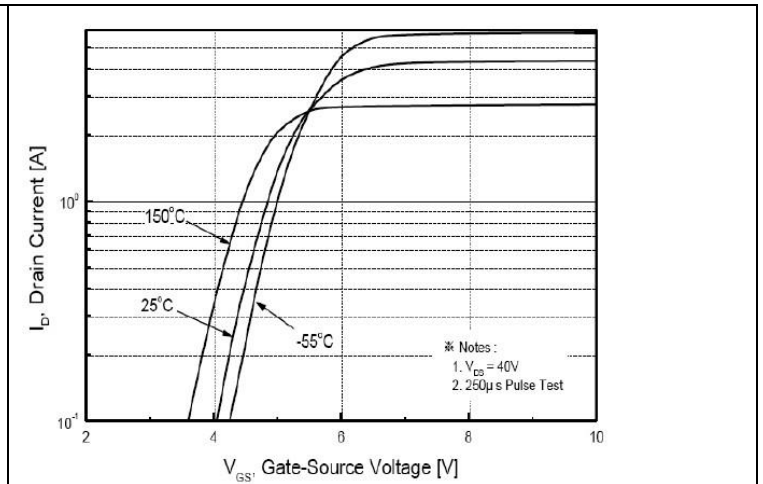


FIG.2-TRANSFER CHARACTERISTICS

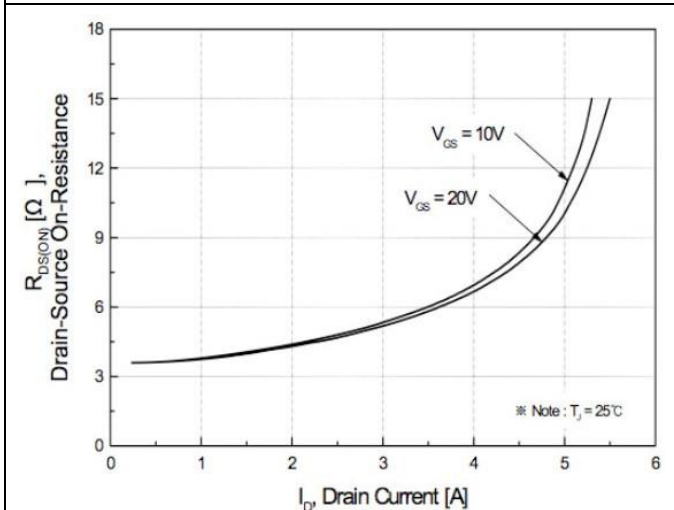


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

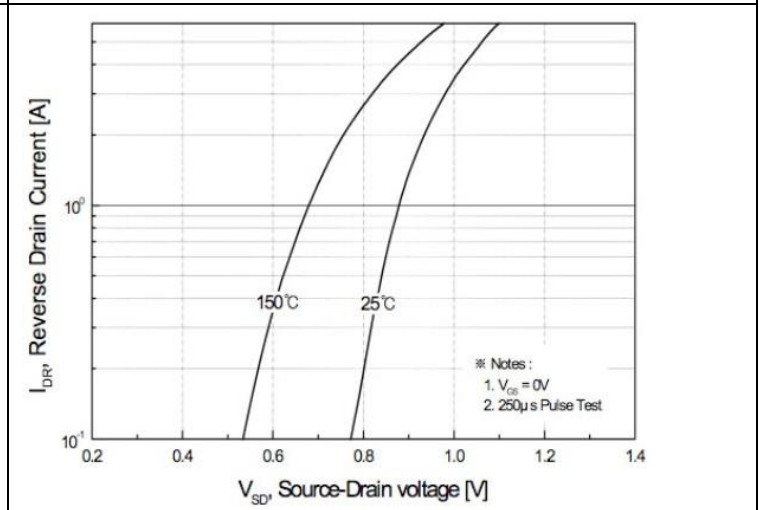


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

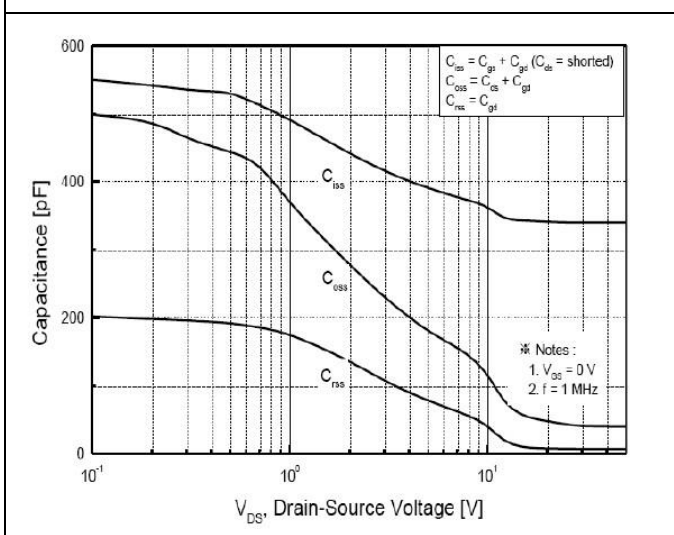


FIG.5-CAPACITANCE CHARACTERISTICS

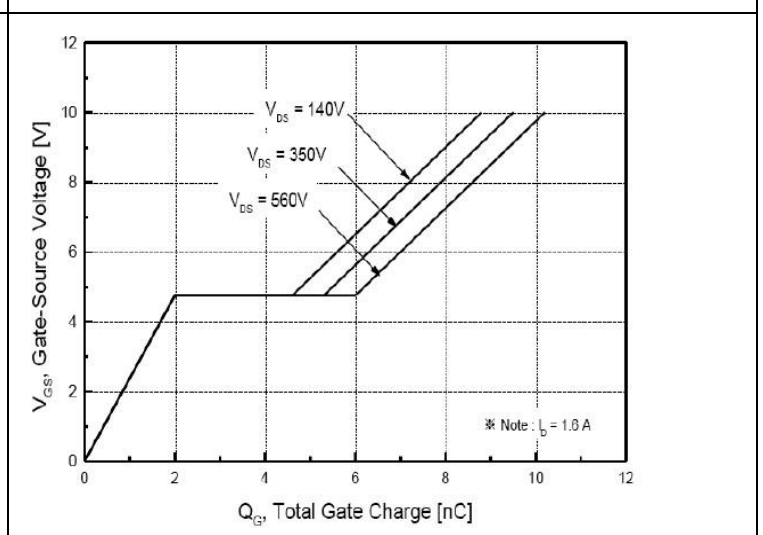


FIG.6-GATE CHARGE CHARACTERISTICS

MSF2N70

N-Channel 700V MOSFET

■ Characteristics Curve

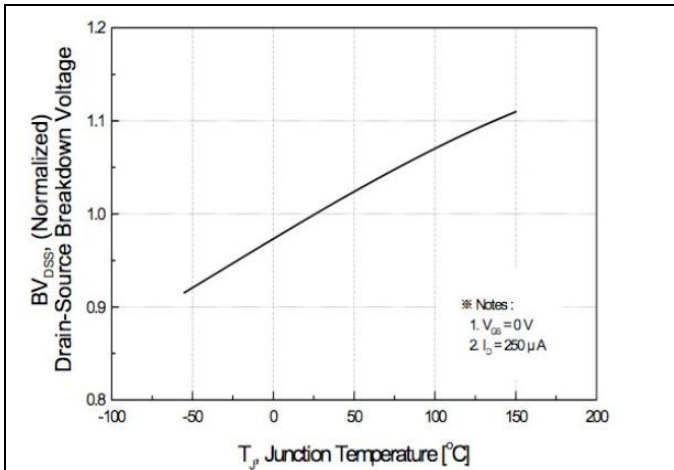


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

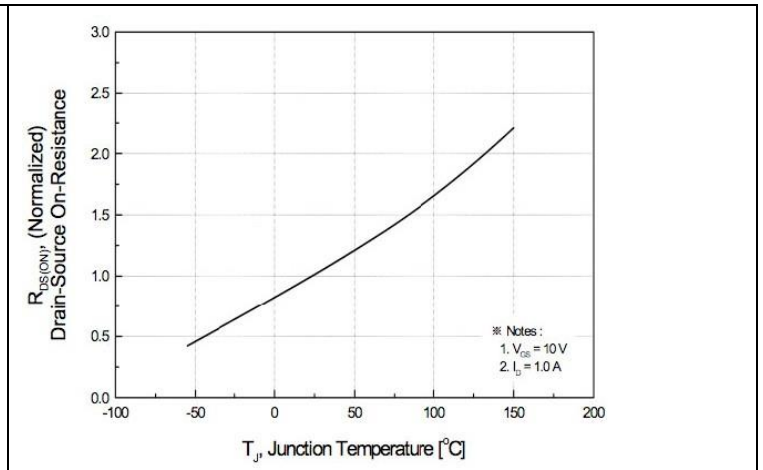


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

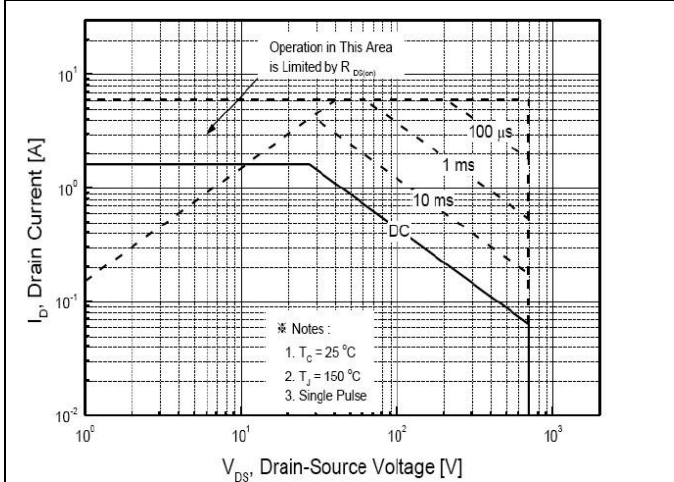


FIG.9-MAXIMUM SAFE OPERATING AREA

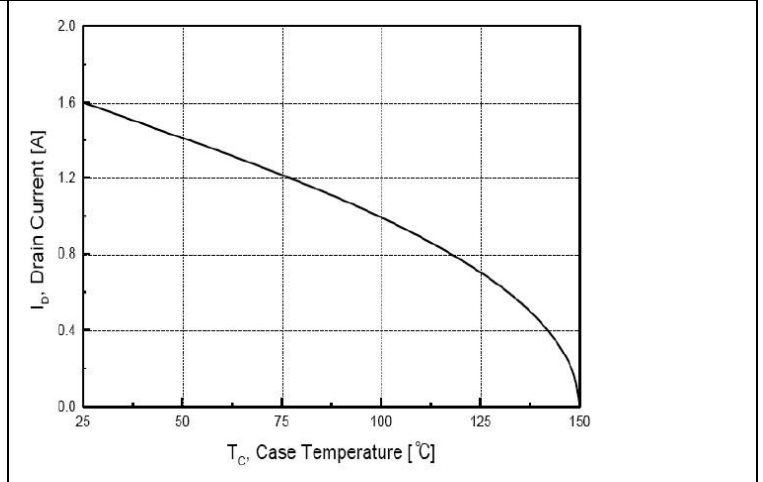


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

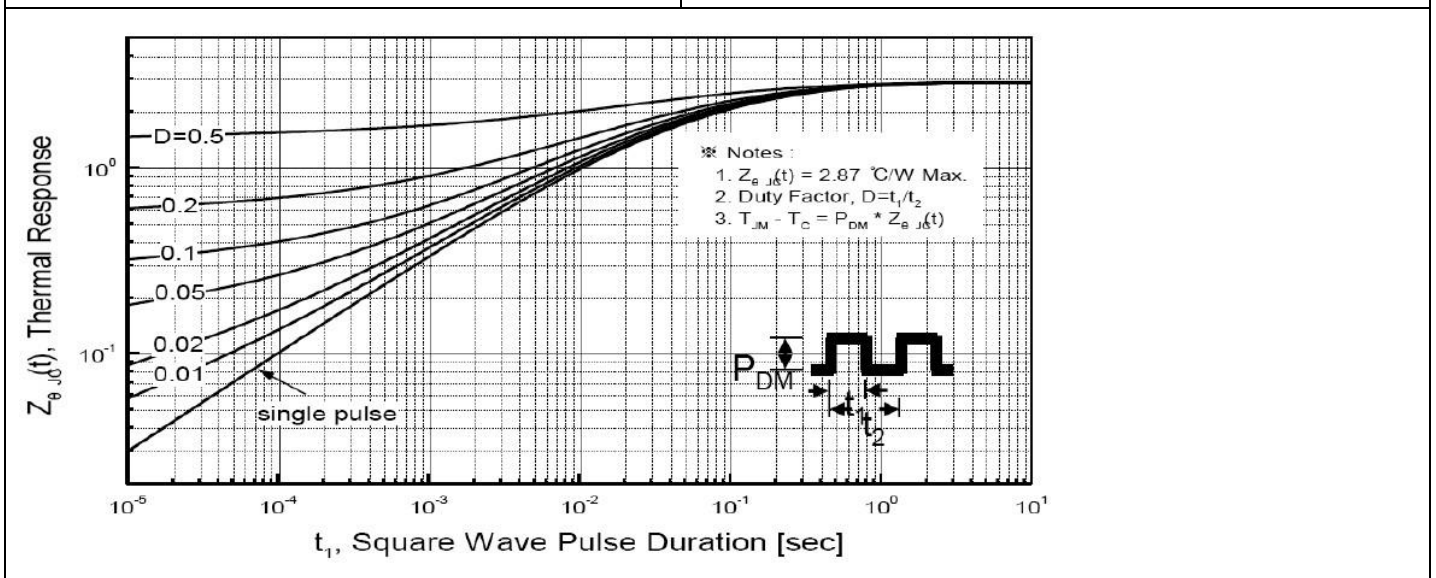


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

MSF2N70

N-Channel 700V MOSFET

■ Characteristics Test Circuit & Waveform

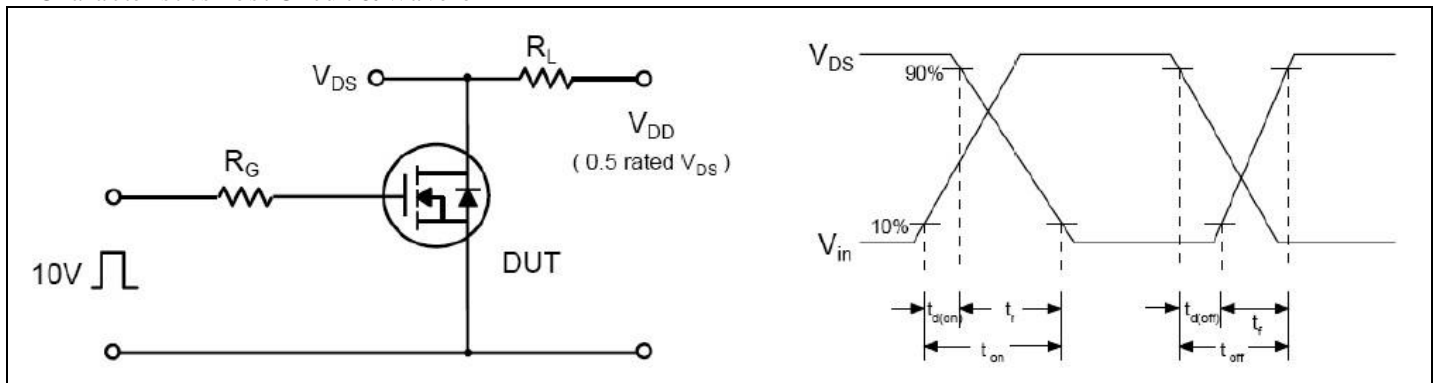


Fig 12. Resistive Switching Test Circuit & Waveforms

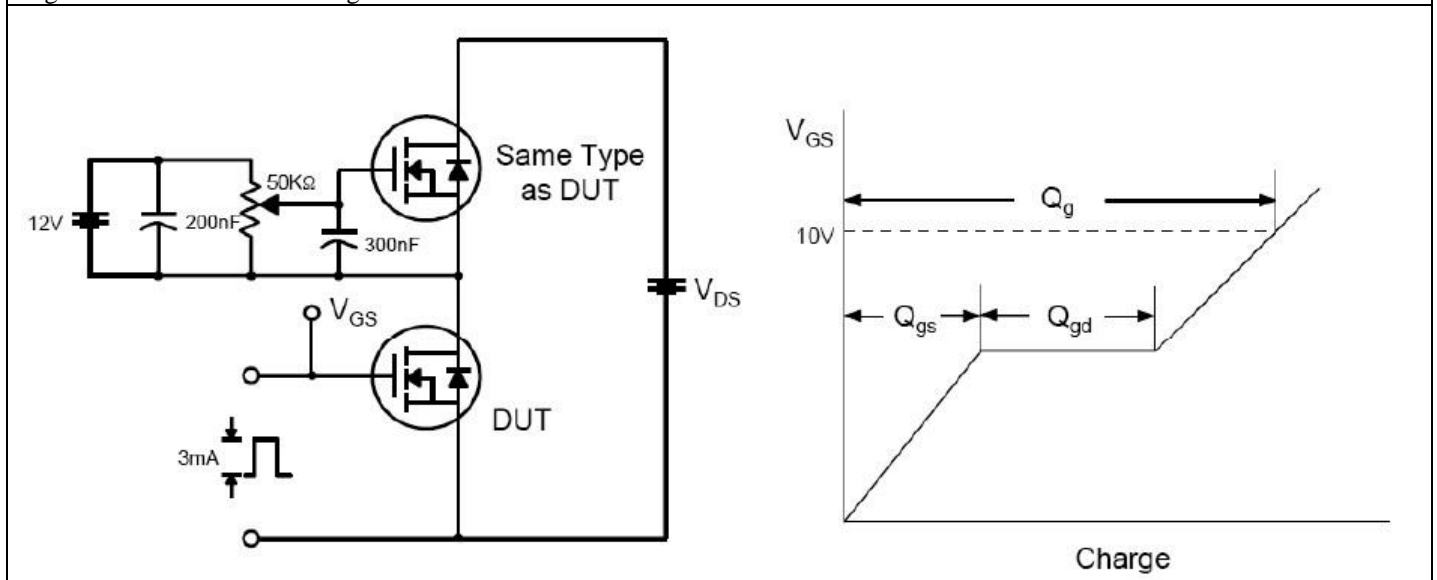


Fig 13. Gate Charge Test Circuit & Waveform

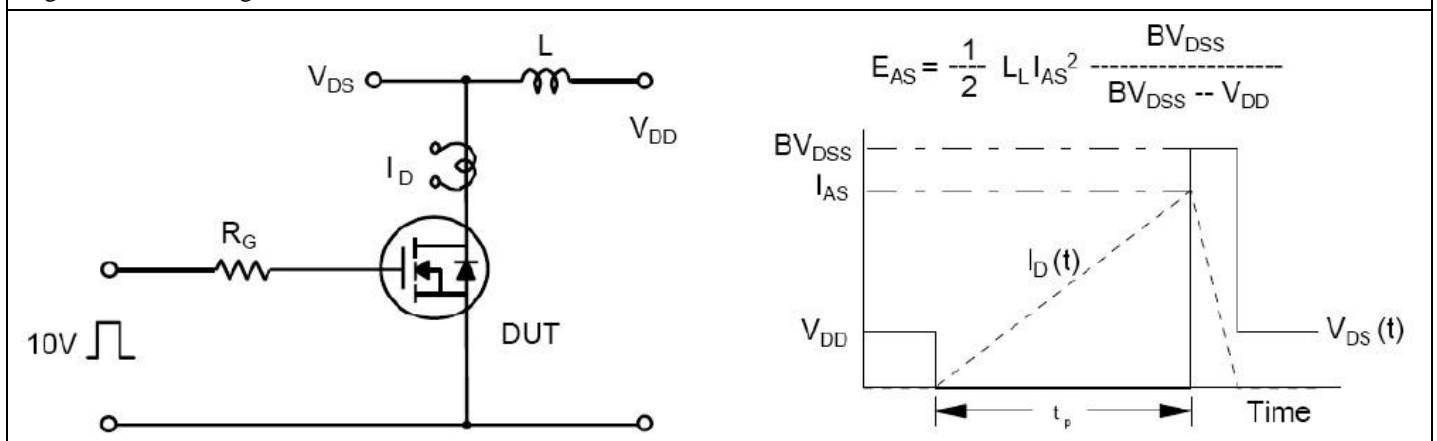


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

MSF2N70

N-Channel 700V MOSFET

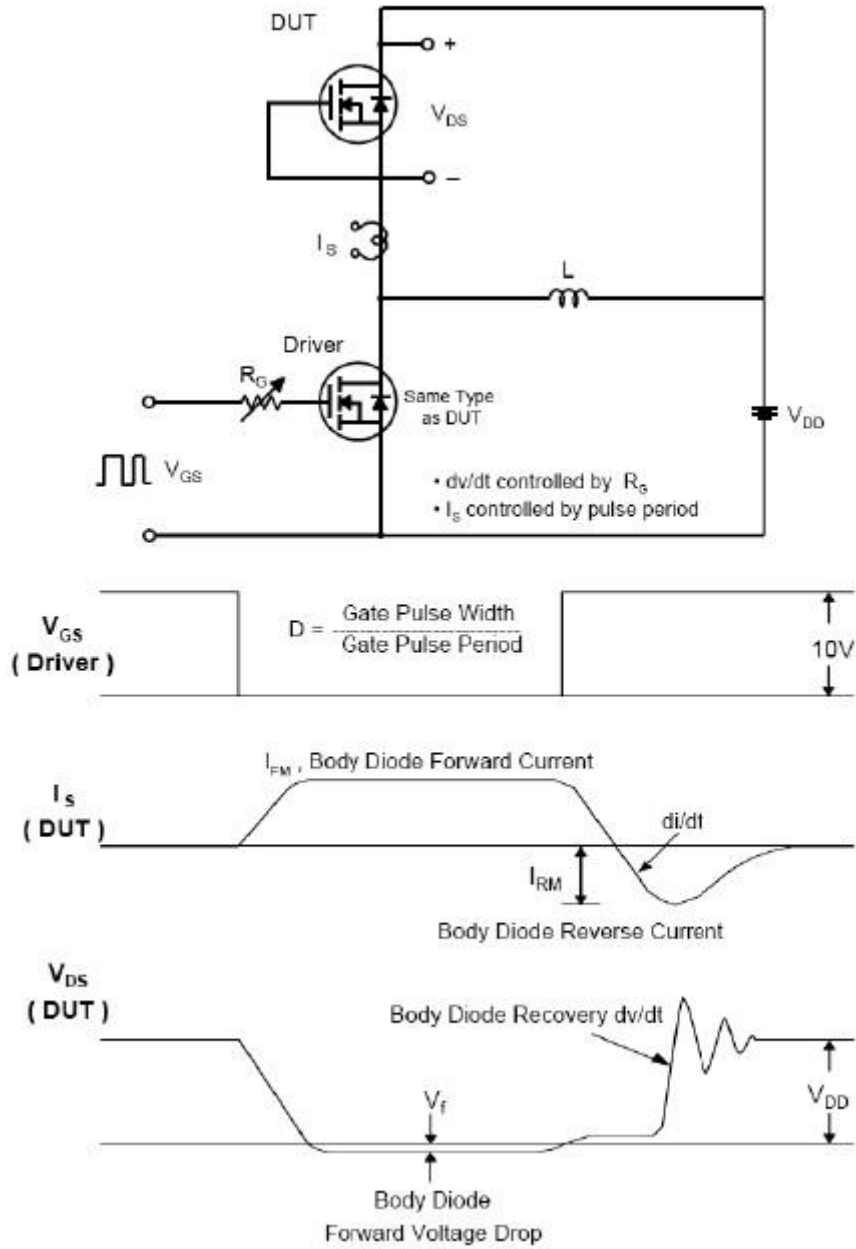


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

MSF2N70

N-Channel 700V MOSFET

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Bruckewell"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

- (i) Any and all liability arising out of the application or use of any product.
- (ii) Any and all liability, including without limitation special, consequential or incidental damages.
- (iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell's knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell's terms and conditions of purchase, including but not limited to the warranty expressed therein.