

MSF18N50

500V N-Channel MOSFET

Description

The MSF18N50 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 TO-220F package is universally preferred for all commercial-industrial applications

Features

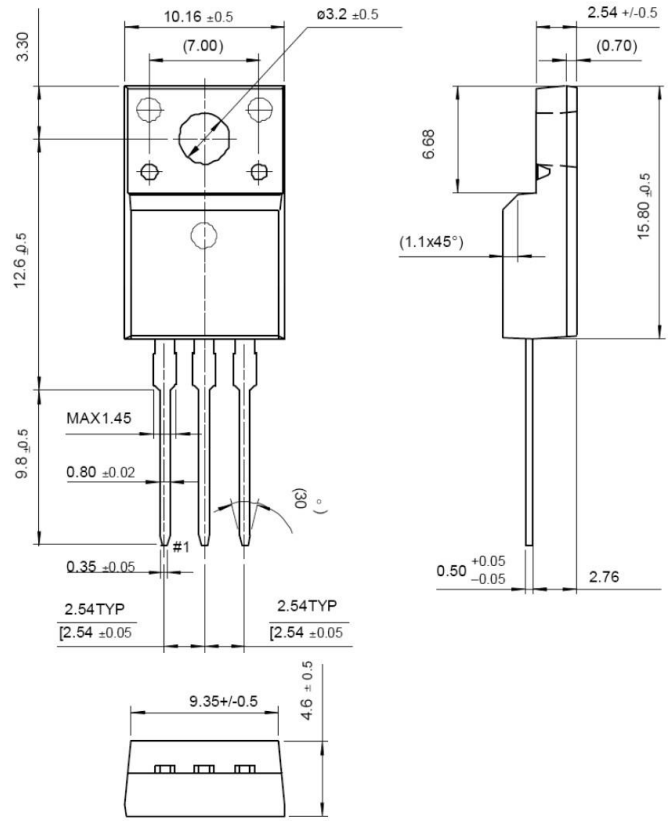
- Originative New Design
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- 100% EAS Test
- Extended Safe Operating Area
- RoHS compliant package

Application

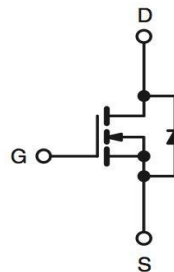
- High current, High speed switching
- PFC (Power Factor Correction)

Packing & Order Information

50/Tube ; 1,000/Box



Graphic symbol



**RoHS
COMPLIANT**

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	500	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current -Continuous (TC=25°C)	18	A
	Drain Current -Continuous (TC=100°C)	10.8	A
I _{DM}	Drain Current Pulsed	72	A
E _{AS}	Single Pulsed Avalanche Energy	990	mJ
E _{AR}	Repetitive Avalanche Energy	23.5	mJ
dV/dt	Peak Diode Recovery dV/dt	4.5	V/ns
P _D	Power Dissipation (TC = 25 °C)	235	W
	Power Dissipation (TC=100°C)	1.8	W/°C

MSF18N50

500V N-Channel MOSFET

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
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 (Tc=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
R _{thjc}	Typical thermal resistance	0.53	°C/W
R _{θJA}		62.5	

Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
V _{GS}	V _{DS} = V _{GS} , I _D =250μA	3.0		5.0	V
*R _{DS(ON)}	V _{GS} =10V, I _D =9.0A	--	0.25	0.32	mΩ
BV _{DSS}	V _{GS} =0 V, I _D =250μA	500	--	--	V
ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		0.6		
I _{DSS}	V _{DS} =500V, V _{GS} = 0 V V _{DS} =400V, V _{GS} = 0 V, T _J = 125°C	--	--	1 10	uA
I _{GSSF}	V _{DS} =30V, V _{Ds} =0 V			100	nA
I _{GSSR}	V _{DS} =-30V, V _{Ds} =0 V	--	--	-100	nA

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
Q _g	V _{DS} =400V, I _D =18A, V _{GS} =10 V	--	48.5	--	nC
Q _{gs}		--	14	--	
Q _{gd}		--	22	--	
t _{d(on)}	V _{DS} =250 V, I _D =18A, R _G =25Ω	--	70	--	ns
t _r		--	190	--	ns
t _{d(off)}		--	100	--	ns
t _f		--	100	--	ns
C _{ISS}		--	2500	--	pF
C _{OSS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	--	400	--	pF
C _{RSS}		--	40	--	pF

MSF18N50

500V N-Channel MOSFET

Source-Drain Diode Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
I_S		--	--	18	A
I_{SM}		--	--	72	
V_{SD}	$I_F=18A, V_{GS}=0$	--	--	1.5	V
t_{rr}	$I_F=18A, V_{GS}=0, di/dt=100A/\mu s$	--	550	--	ns
Q_{rr}		--	5.5	--	μC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L=5.5mH, I_{AS}=18A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$
3. $I_{SD} \leq 16A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, 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

MSF18N50

500V N-Channel MOSFET

■ Characteristics Curve

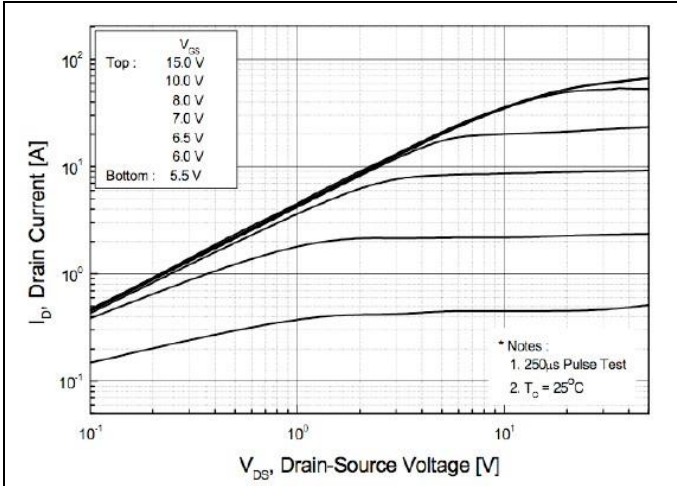


FIG.1-ON REGION CHARACTERISTICS

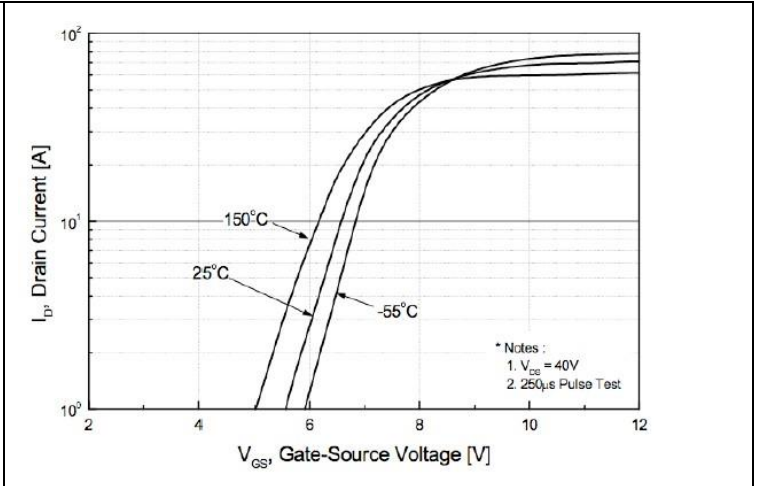


FIG.2-TRANSFER CHARACTERISTICS

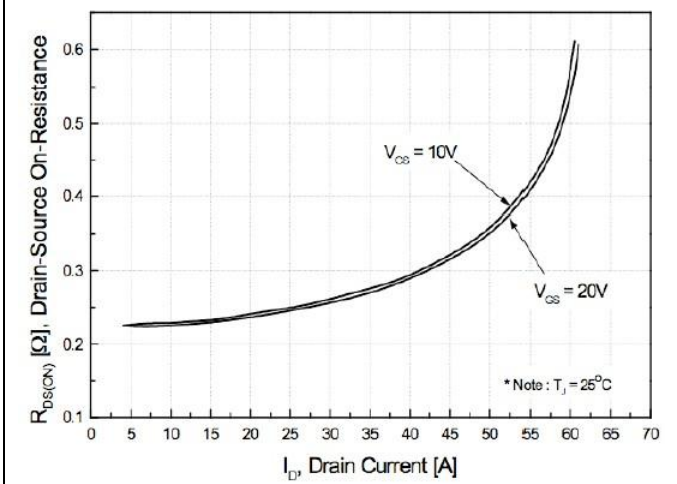


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

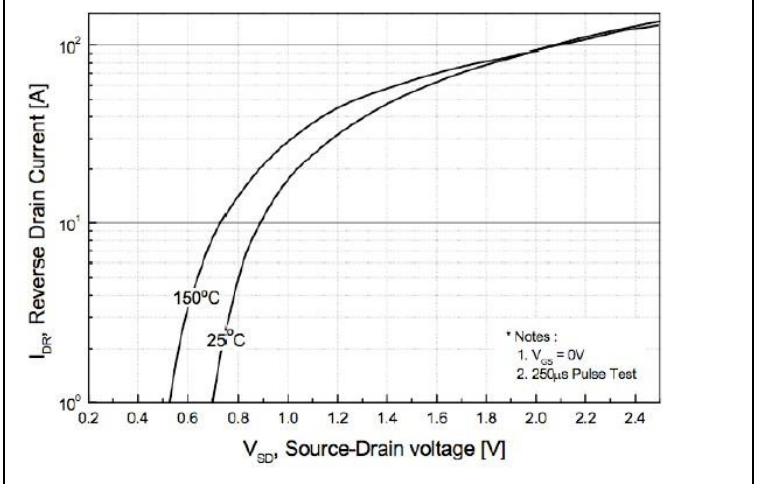


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

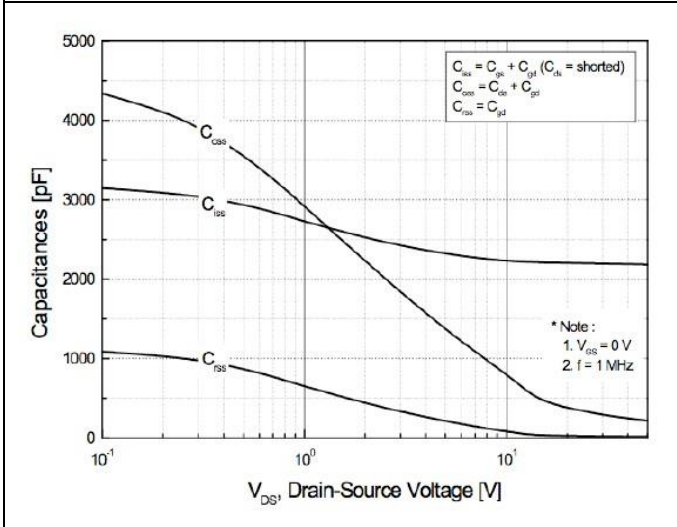


FIG.5-CAPACITANCE CHARACTERISTICS

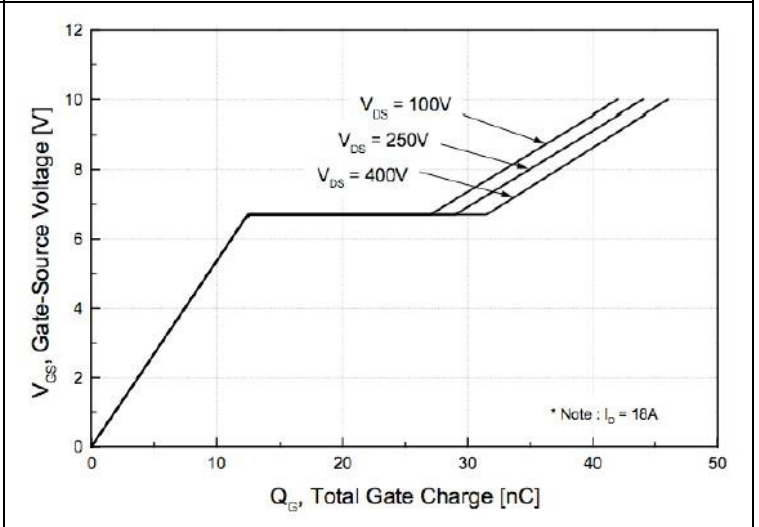
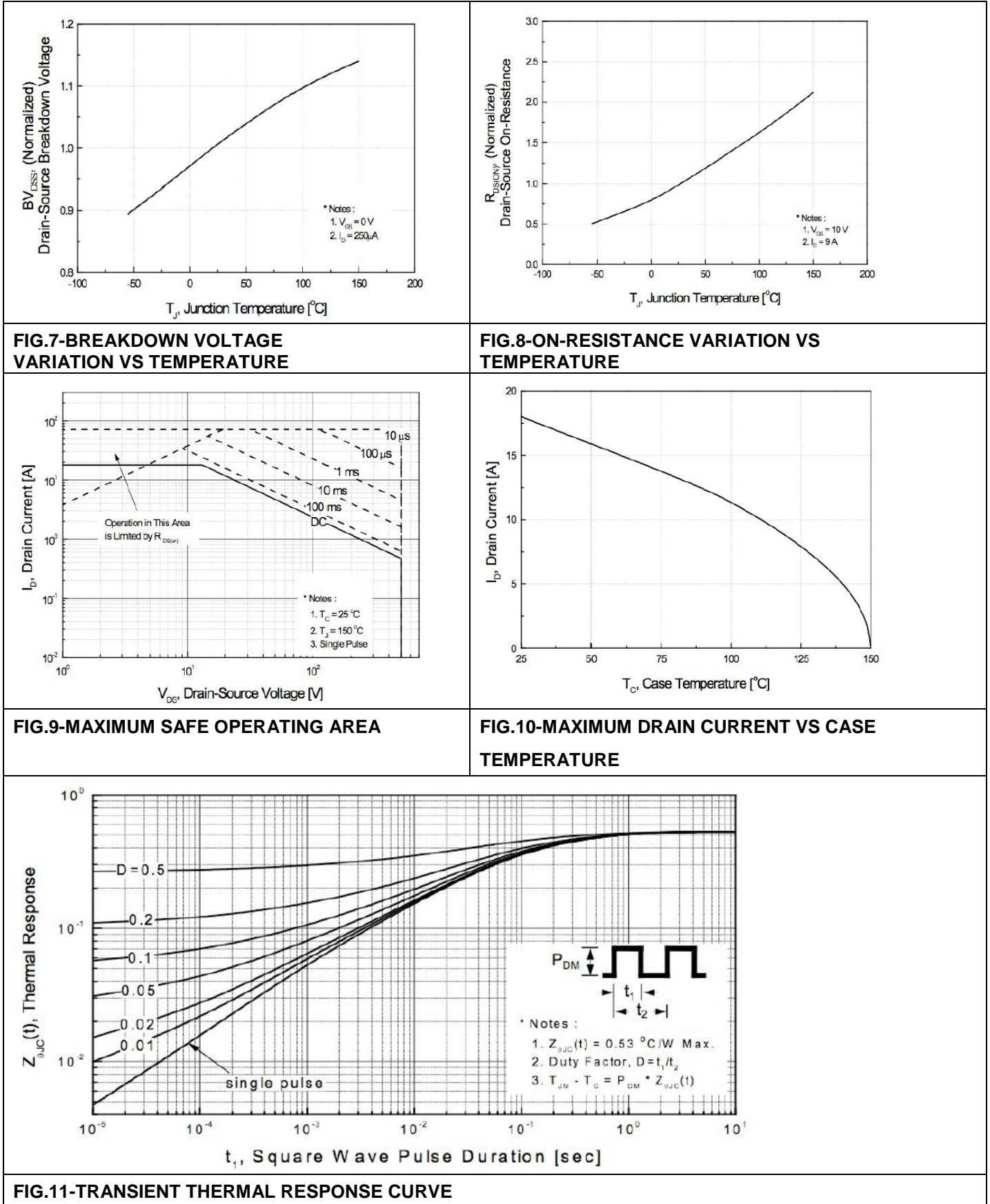


FIG.6-GATE CHARGE CHARACTERISTICS

MSF18N50

500V N-Channel MOSFET

■ Characteristics Curve



MSF18N50

500V N-Channel MOSFET

■ Characteristics Test Circuit & Waveform

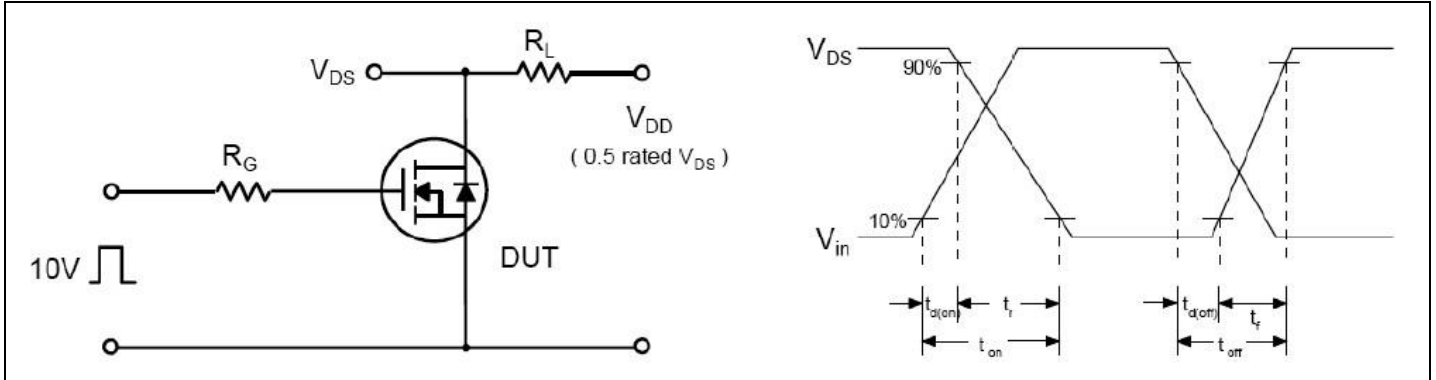


Fig 12. Resistive Switching Test Circuit & Waveforms

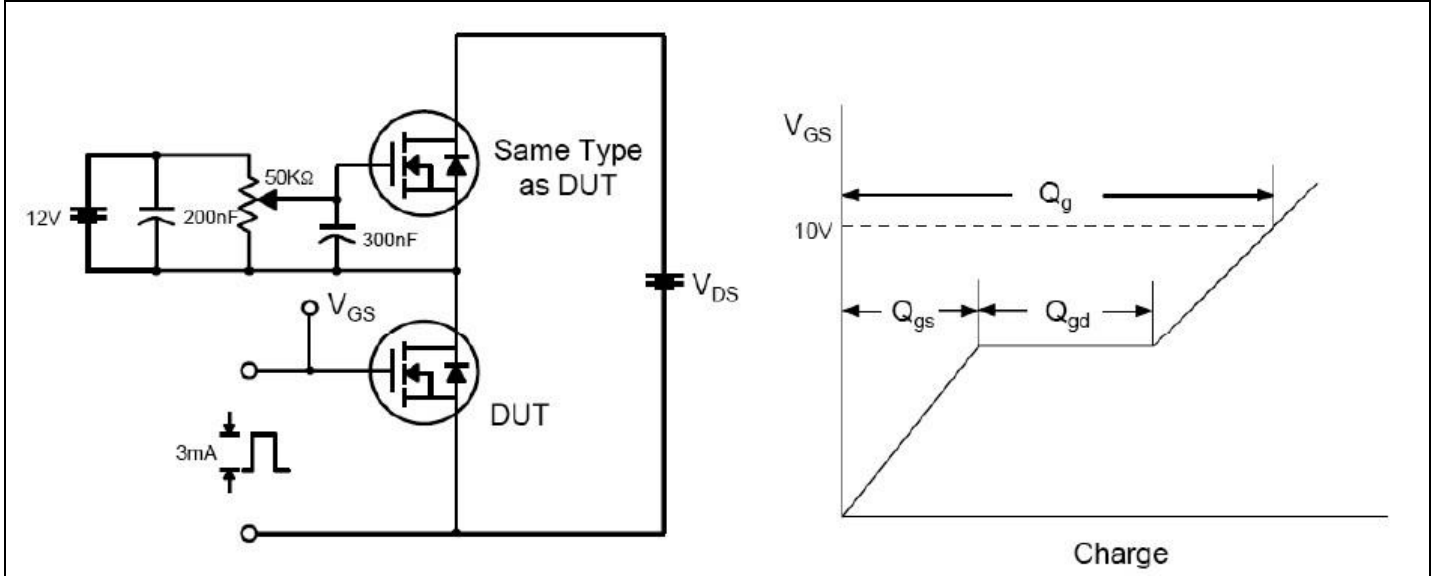


Fig 13. Gate Charge Test Circuit & Waveform

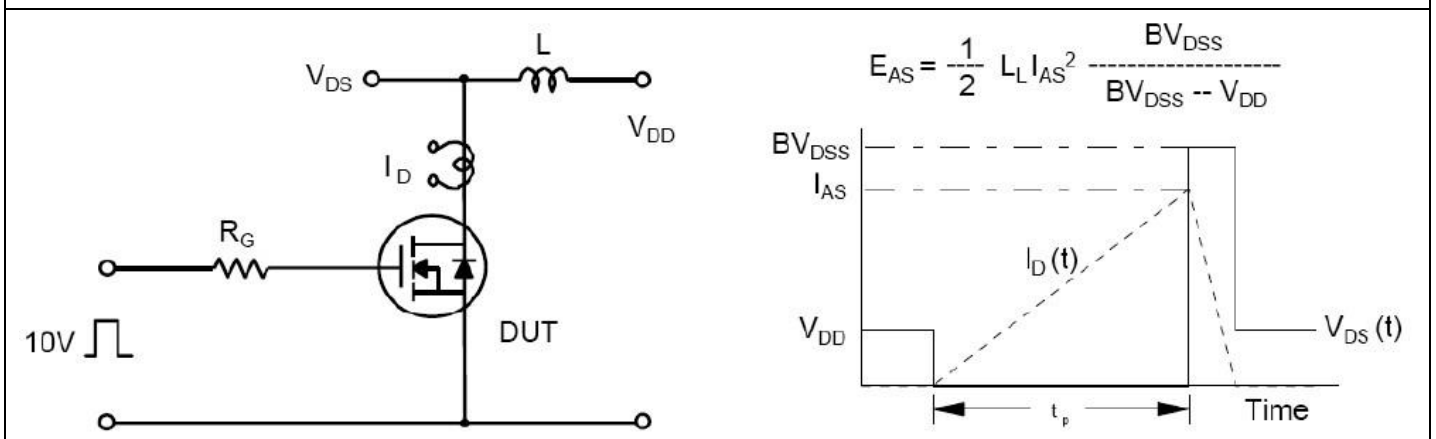


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

MSF18N50

500V N-Channel MOSFET

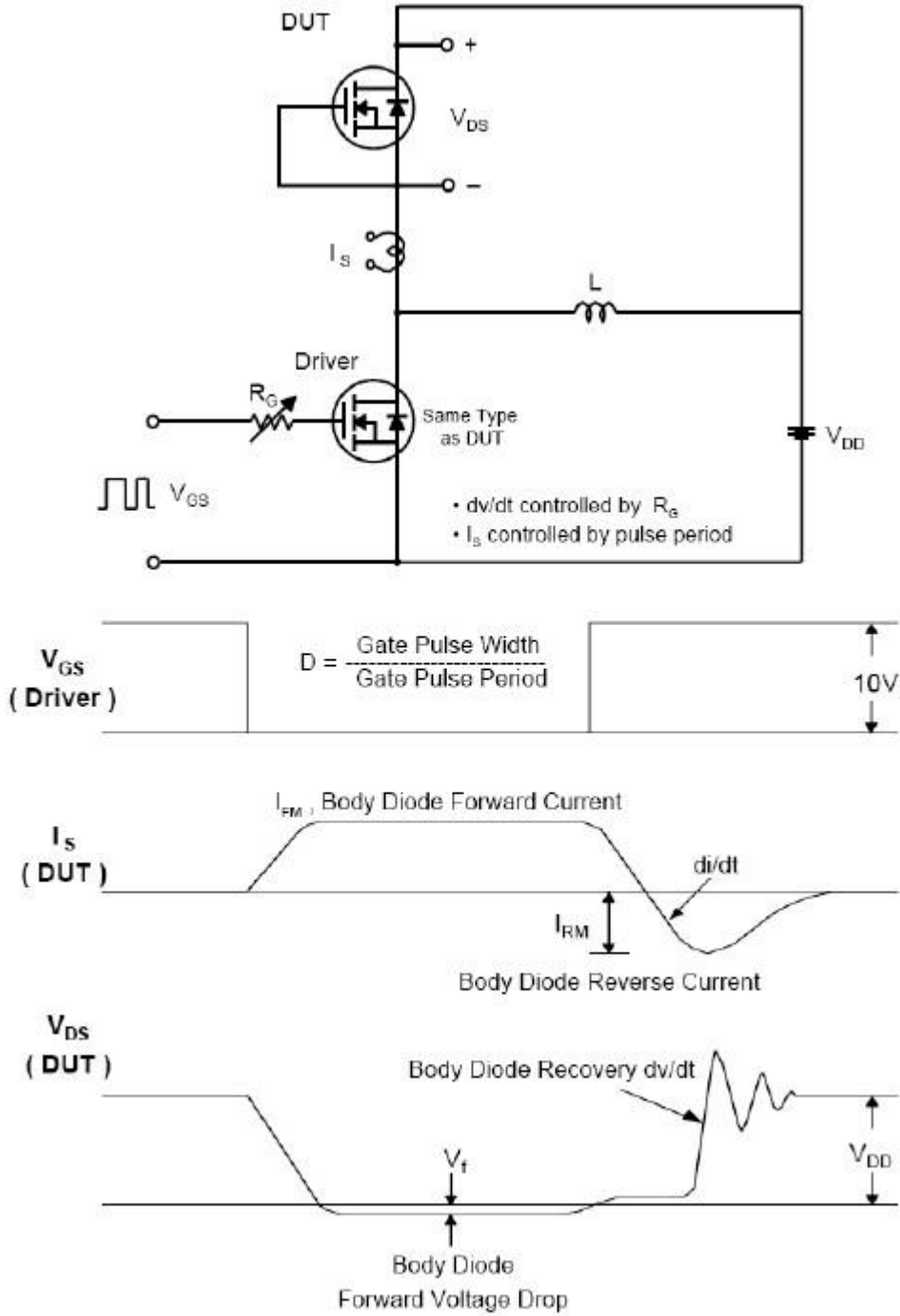


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

MSF18N50

500V N-Channel 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.