

MSF8N50

N-Channel 500V MOSFET

Description

The MSF8N50 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

- BVDSS=550V typically @ Tj=150°C
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

Application

- Ballast
- Inverter

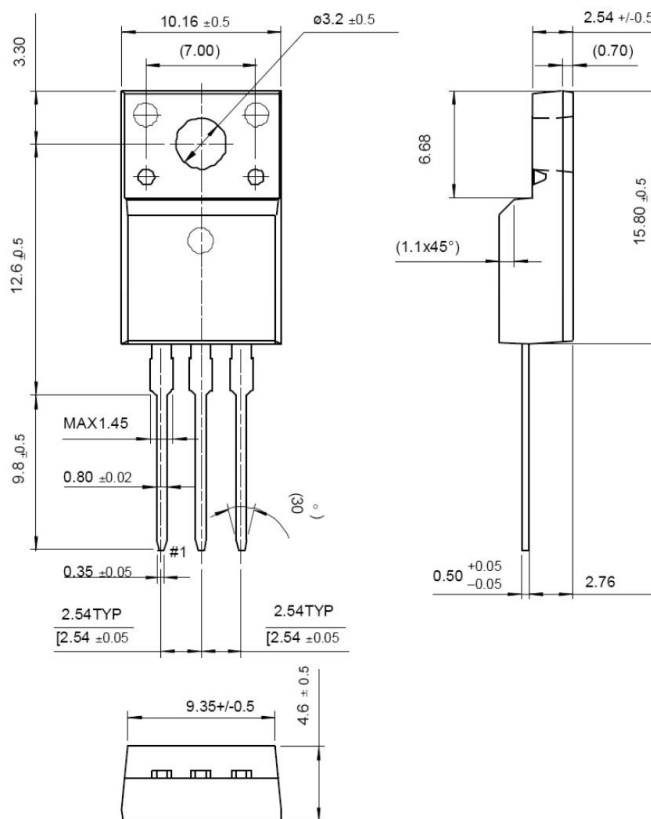
Package type : ITO-220AB

Packing & Order Information

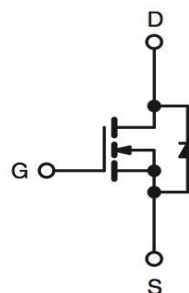
50/Tube ; 1,000/Box



RoHS
COMPLIANT



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	500	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current -Continuous (TC=25°C)	8	A
	Drain Current -Continuous (TC=100°C)	4.8	A
I _{DM}	Drain Current Pulsed	32	A
E _{AS}	Single Pulsed Avalanche Energy	288	mJ
E _{AR}	Repetitive Avalanche Energy	12.5	mJ

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Symbol	Parameter	Value	Unit
P _D	Power Dissipation (TC = 25 °C)	44	W
	Power Dissipation (TC = 100 °C)	0.35	W/°C
T _J ,T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C

Note:

1. Pulse width limited by maximum junction temperature
2. Duty cycle ≤ 1%

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

Symbol	Parameter	Max.	Units
R _{thjc}	Maximum Junction-to-Case	2.8	°C/W
R _{θJA}	Maximum Junction-to-Ambient	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 = 4 A	--	0.7	0.85	Ω
BV _{DSS}	V _{GS} = 0 V, I _D = 250μA	500	--	--	V
ΔBV _{DSS} / ΔT _J	I _D = 250μA, Referenced to 25°C	--	0.5	--	V/°C
I _{DSS}	V _{DS} = 500 V, V _{GS} = 0 V V _{DS} = 400 V, V _{GS} = 0 V, T _J = 125°C	--	--	1 10	uA
I _{GSS}	V _{DS} = ±30	--	--	±100	nA

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
Q _g	V _{DS} = 400 V, I _D = 8 A, V _{GS} = 10 V	--	25	33	nC
Q _{gs}		--	4	5	nC
Q _{gd}		--	10	13	nC
t _{d(on)}	V _{DD} = 250 V, I _D = 8 A, R _G = 25 Ω	--	15	30	ns
t _r		--	25	50	ns
t _{d(off)}		--	60	120	ns
t _f		--	25	50	ns
C _{ISS}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0MHz	--	850	1105	pF
C _{OSS}		--	150	195	pF
C _{RSS}		--	20	26	pF

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Source-Drain Diode Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
I_S		--	--	8	A
I_{SM}		--	--	32	
V_{SD}	$I_F = I_S, V_{GS} = 0$	--	--	1.5	V
t_{rr}	$I_F = I_S, dI_F/dt = 100A/\mu s$	--	310	--	ns
Q_{rr}		--	2.3	--	nC

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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■ Characteristics Curve

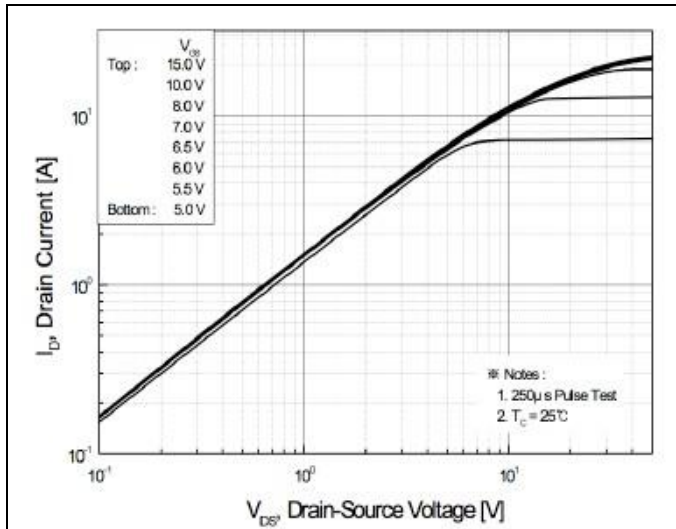


FIG.1-ON REGION CHARACTERISTICS

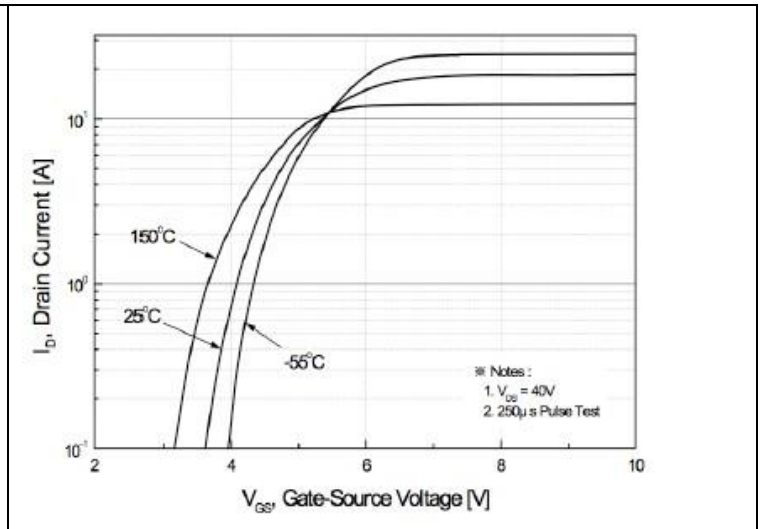


FIG.2-TRANSFER CHARACTERISTICS

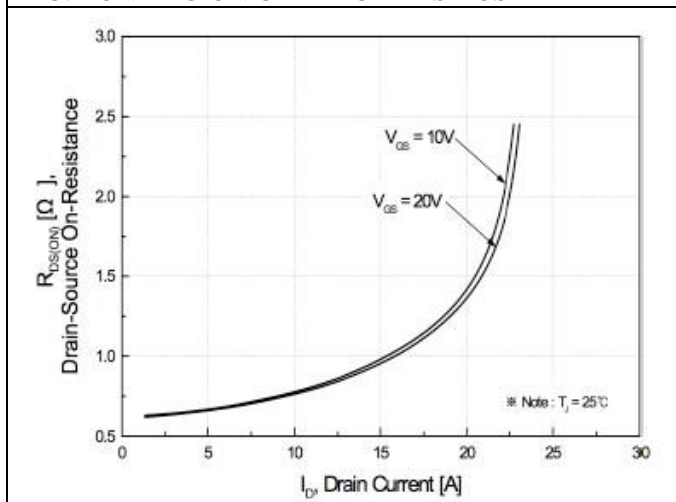


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

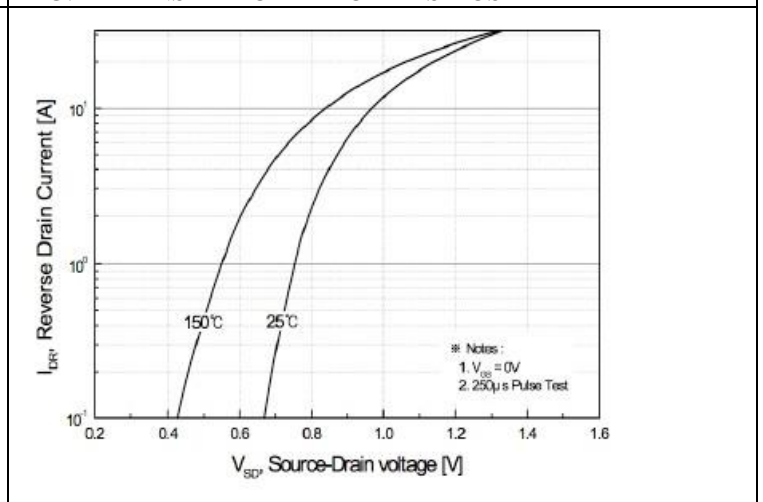


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

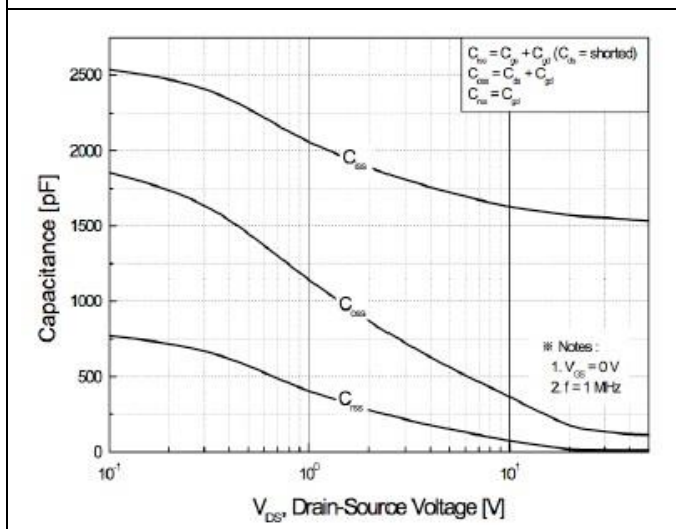


FIG.5-CAPACITANCE CHARACTERISTICS

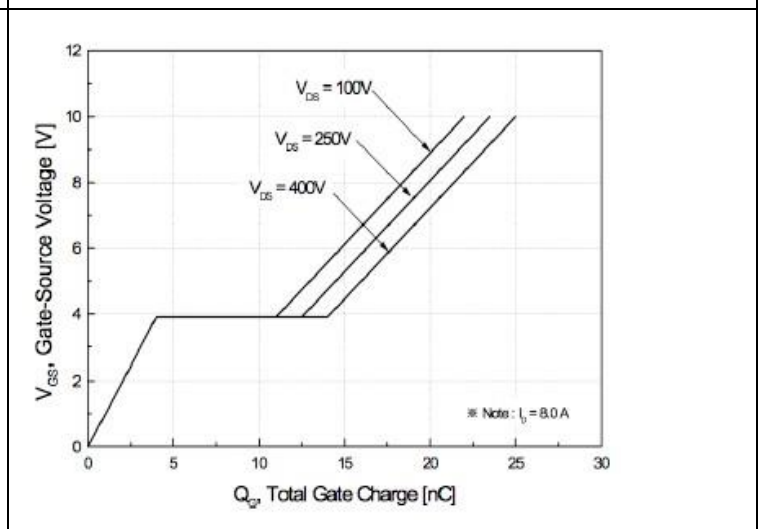


FIG.6-GATE CHARGE CHARACTERISTICS

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■ Characteristics Curve

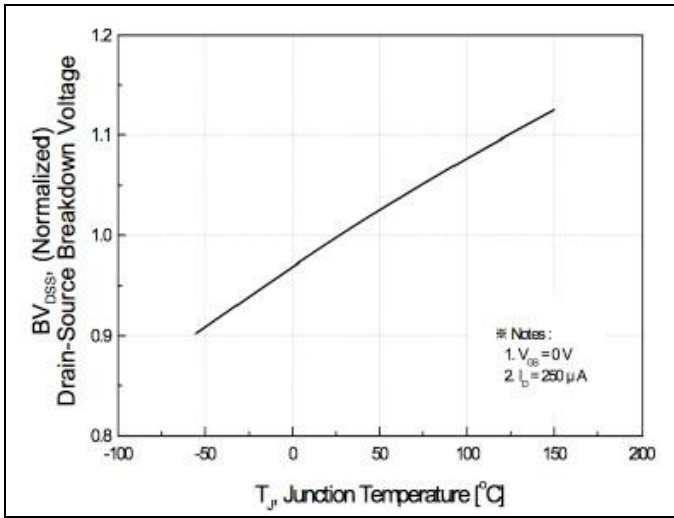


FIG. 7 - BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

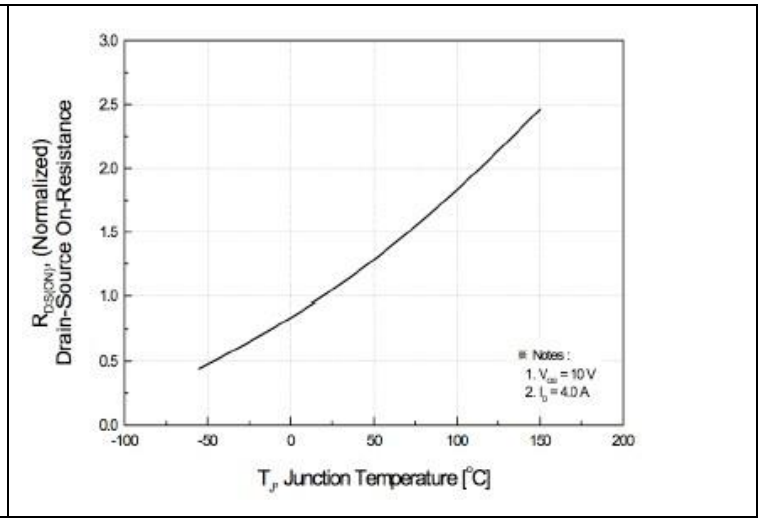


FIG. 8 - ON-RESISTANCE VARIATION VS TEMPERATURE

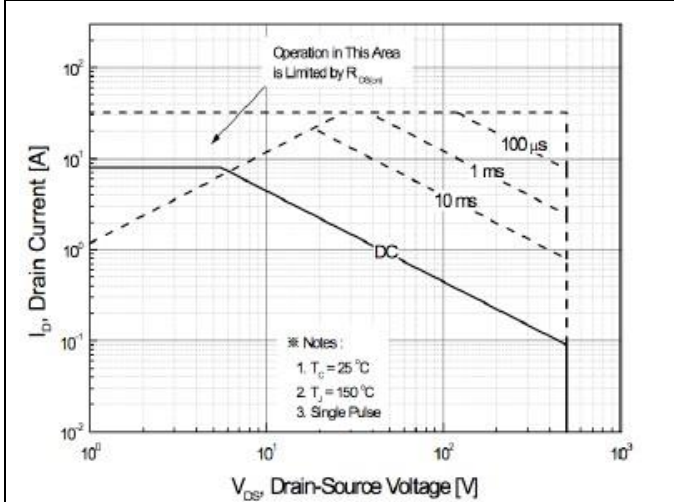


FIG. 9 - MAXIMUM SAFE OPERATING AREA

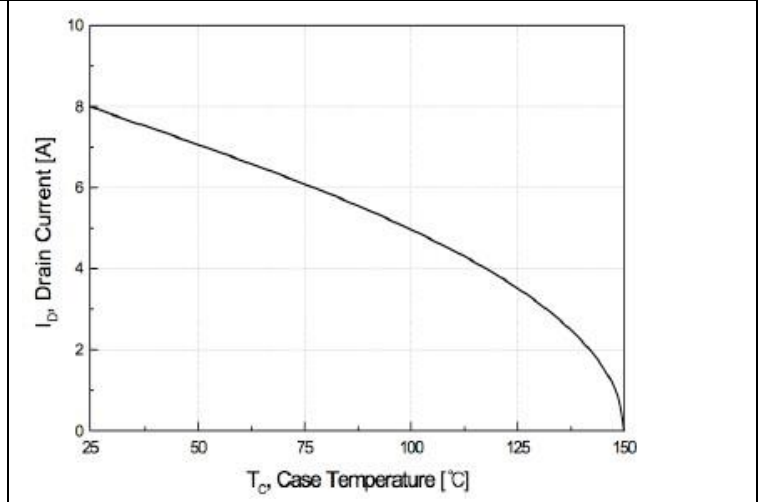


FIG. 10 - MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

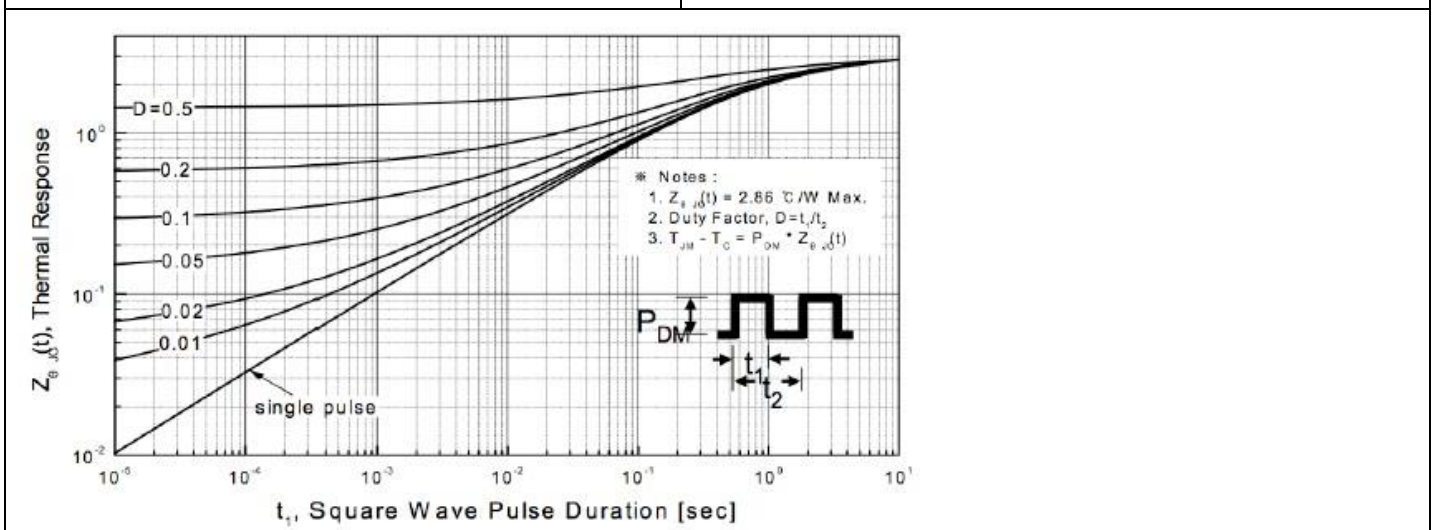


FIG. 11 - TRANSIENT THERMAL RESPONSE CURVE

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■ Characteristics Test Circuit & Waveform

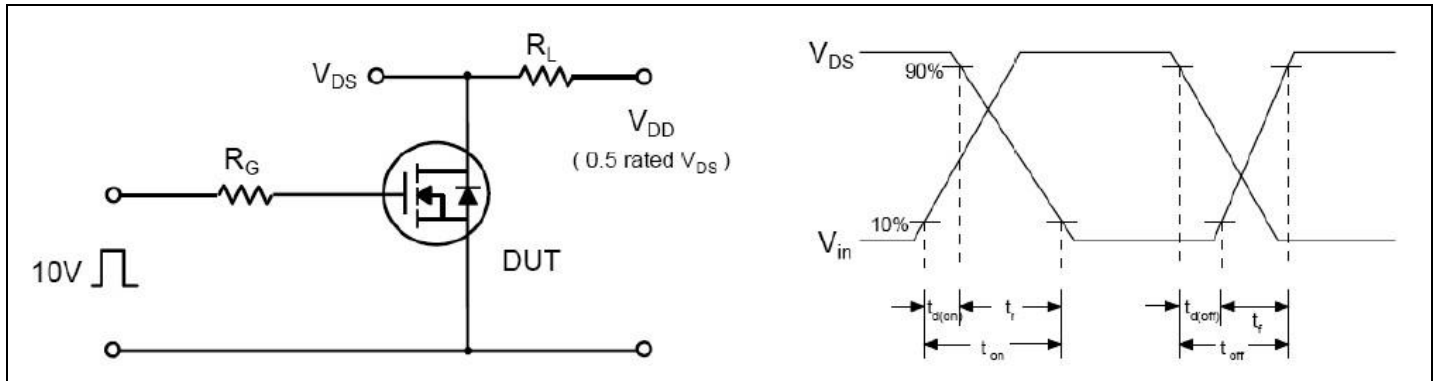


Fig 12. Resistive Switching Test Circuit & Waveforms

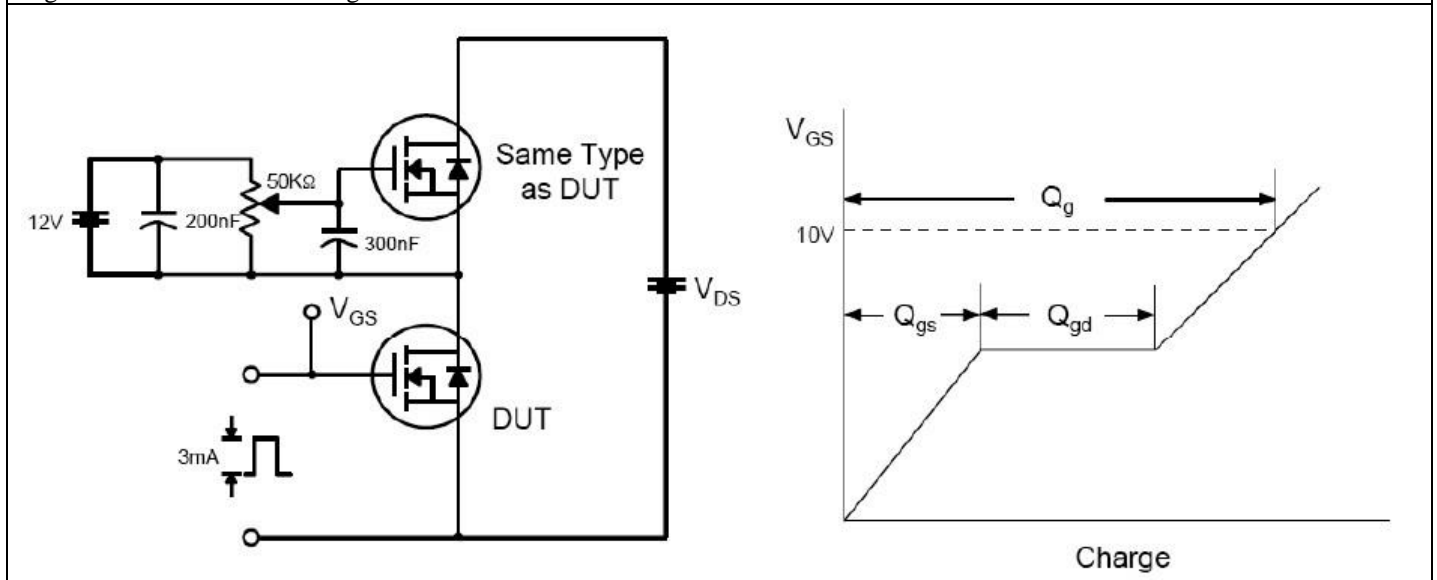


Fig 13. Gate Charge Test Circuit & Waveform

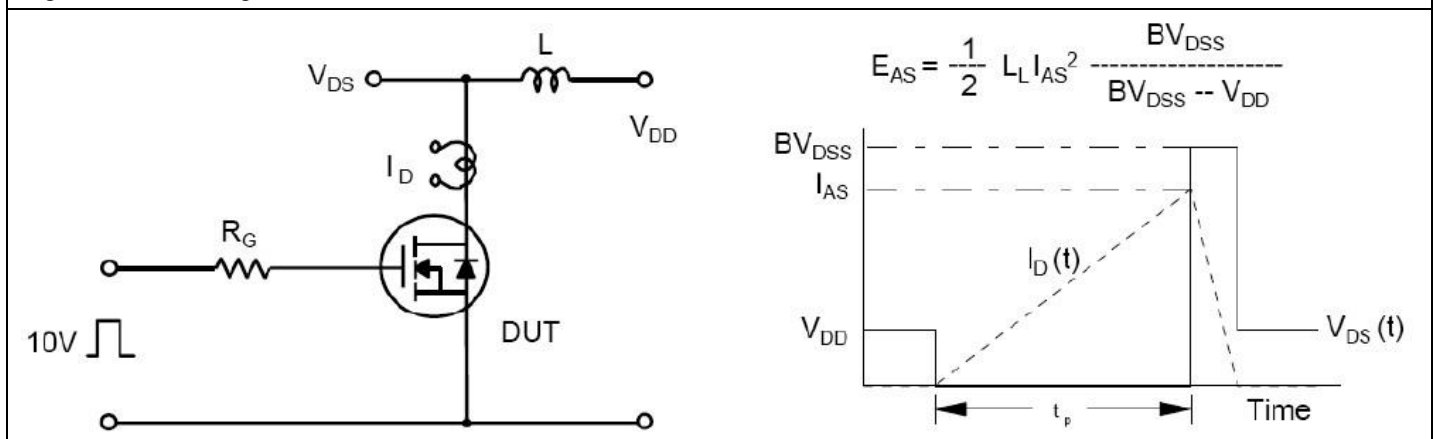


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

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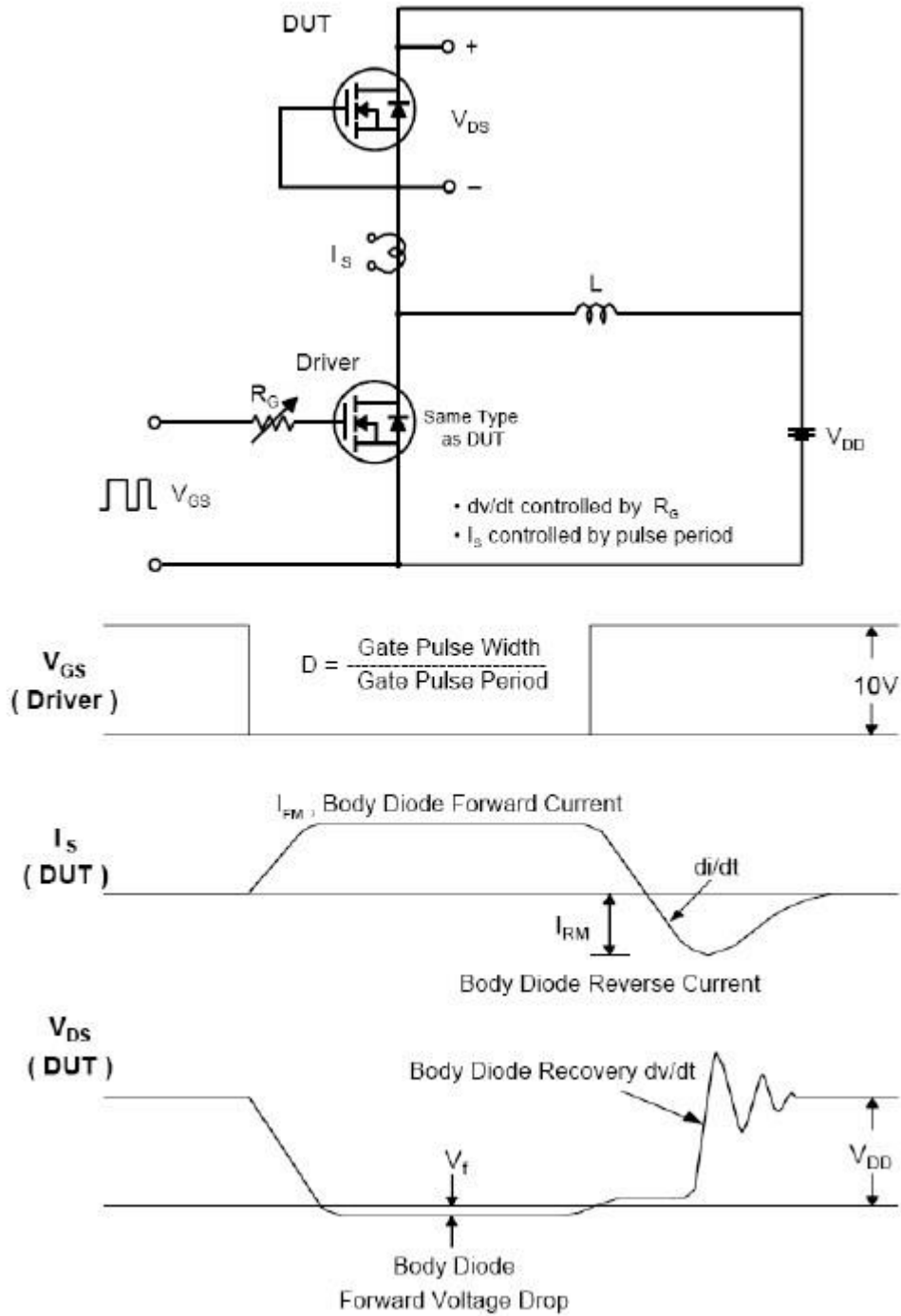


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

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