

MS 6N80

800V N-Channel MOSFET

Description

The MS6N80 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-220AB package is universally preferred for all commercial-industrial applications

Features

- Originative New Design
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Unrivalled Gate Charge : 37nC (Typ.)
- Extended Safe Operating Area
- RoHS compliant package

Application

- Adapter
- Switching Mode Power Supply

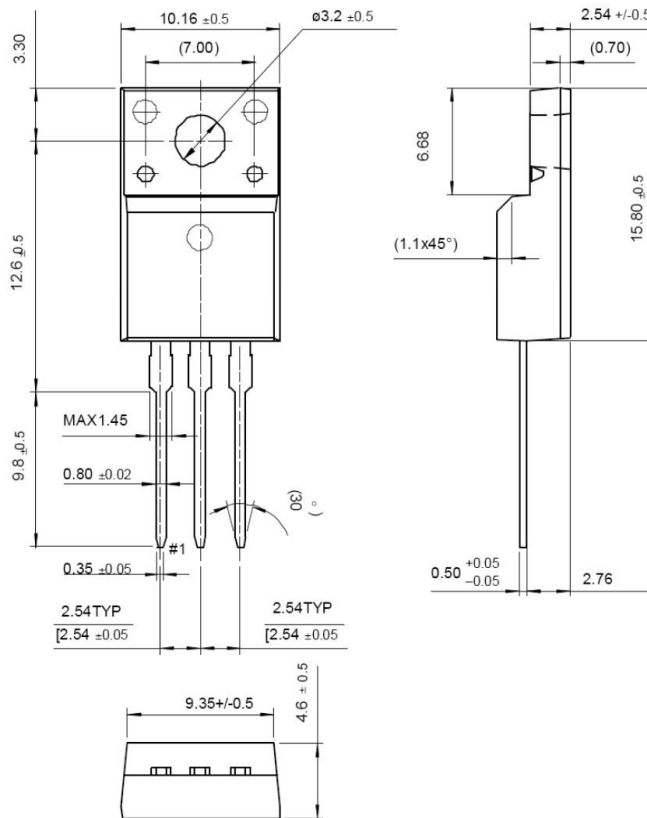
Package type : TO-220AB

Packing & Order Information

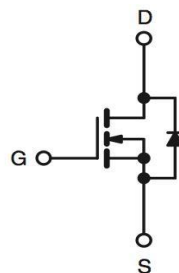
50/Tube ; 1,000/Box



**RoHS
COMPLIANT**



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	800	V
I _D	Drain Current -Continuous (TC=25°C)	6	A
	Drain Current -Continuous (TC=100°C)	4.2	A
I _{DM}	Drain Current -Pulsed	28	A
V _{GS}	Gate-Source Voltage	±30	V
E _{AS}	Single Pulsed Avalanche Energy	580	mJ
E _{AR}	Repetitive Avalanche Energy	16.7	mJ
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns
P _D	Power Dissipation (TC=25°C) - Derate above 25°C	156	W
		1.25	W/°C

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

Symbol	Parameter	Value	Unit
T _J /T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T _L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C

● Drain current limited by maximum junction temperature

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case	--	0.75	°C/W
R _{θJA}	Junction-to-Ambient	--	62.5	

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V _{GS}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.5	--	4.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 3 A	--	1.6	2.3	Ω

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250μA	800	--	--	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D = 250μA, Referenced to 25°C	--	0.6	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 800 V, V _{GS} = 0 V V _{DS} = 640 V, V _C = 125°C	--	--	10 100	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	μA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	100	nA

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C _{ISS}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0MHz	--	1500	2010	pF
C _{OSS}	Coss Output Capacitance		--	145	190	pF
C _{RSS}	Crss Reverse Transfer Capacitance		--	13	20	pF

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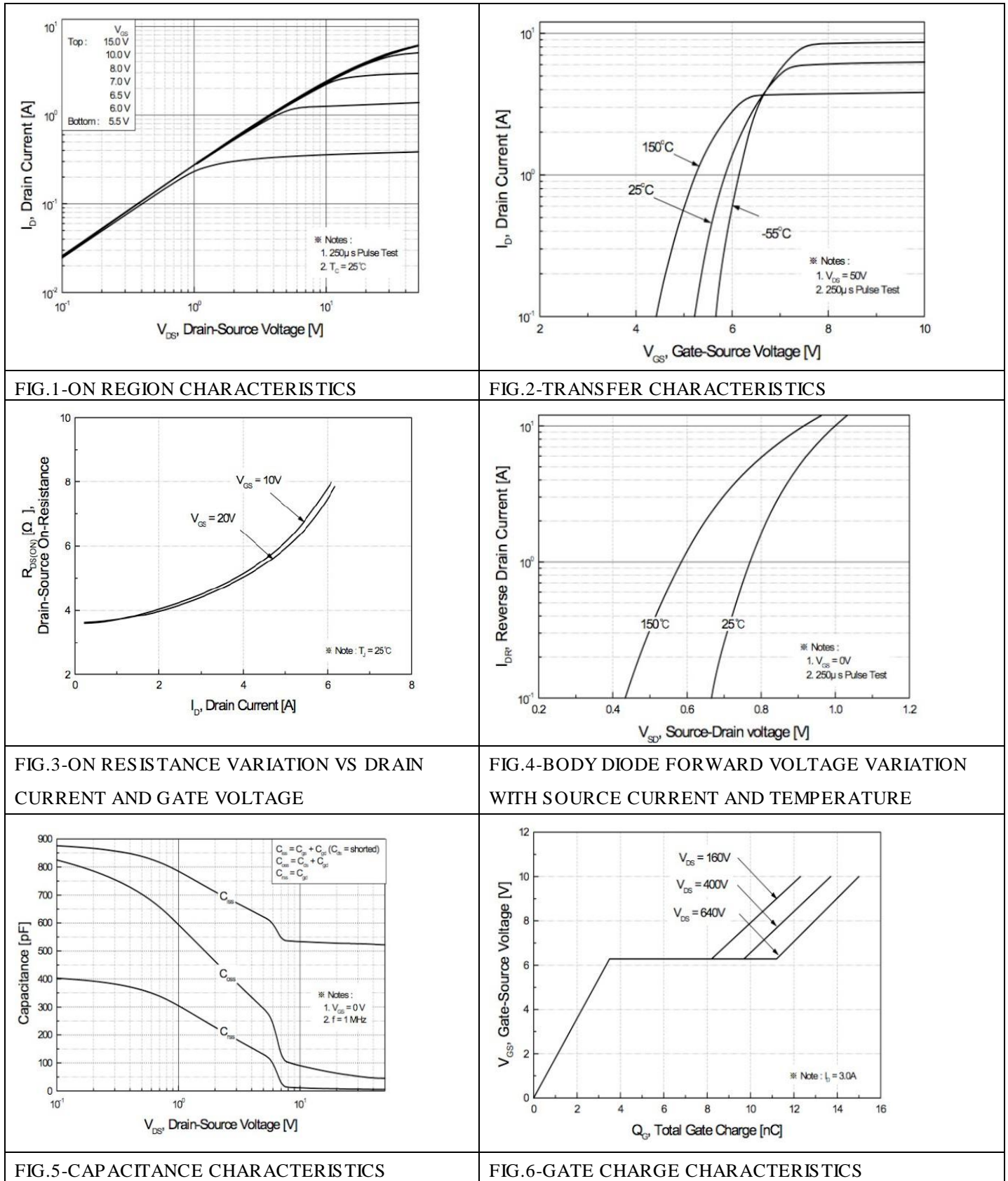
Switching Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	$V_{DS} = 400\text{ V}, I_D = 6\text{ A},$ $R_G = 25\ \Omega$	--	40	--	ns
t_r	Turn-On Rise Time		--	120	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	60	--	ns
t_f	Turn-Off Fall Time		--	70	--	ns
Q_g	Total Gate Charge	$V_{DS} = 640\text{ V}, I_D = 6\text{ A},$ $V_{GS} = 7\text{ V}$	--	35	--	nC
Q_{gs}	Gate-Source Charge		--	11	--	nC
Q_{gd}	Gate-Drain Charge		--	15	--	nC

Source-Drain Diode Maximum Ratings and Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S	Continuous Source-Drain Diode Forward Current		--	--	7	A
I_{SM}	ISM Pulsed Source-Drain Diode Forward Current		--	--	28	
V_{SD}	Source-Drain Diode Forward Voltage	$I_S = 6\text{ A}, V_{GS} = 0\text{ V}$	--	--	1.4	V
t_{rr}	Reverse Recovery Time	$I_S = 6\text{ A}, V_{GS} = 0\text{ V}$ $diF/dt = 100\text{ A}/\mu\text{s}$	--	650	--	ns
Q_{rr}	Reverse Recovery Charge		--	8	--	μC

Notes :

1. Repeativity rating : pulse width limited by junction temperature
2. $L = 34.0\text{mH}, I_{AS} = 6.0\text{A}, V_{DD} = 50\text{V}, R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 6.0\text{A}, di/dt \leq 200\text{A}/\mu\text{s}, V_{DD} \leq BVDSS$, Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially independent of operating temperature.

Characteristics Curve



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Characteristics Curve

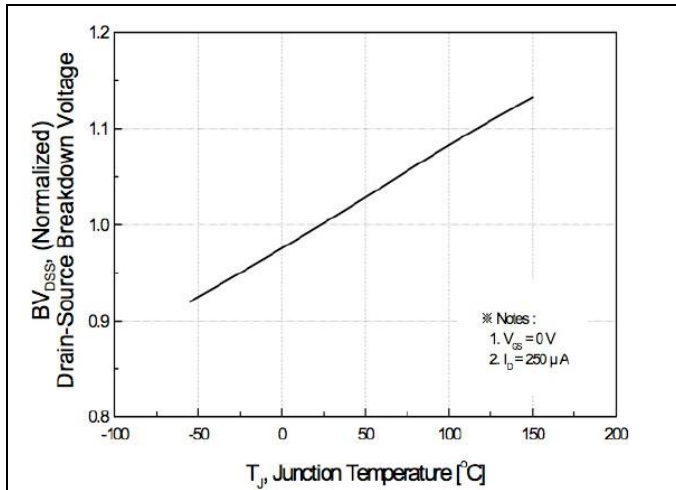


FIG. 7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

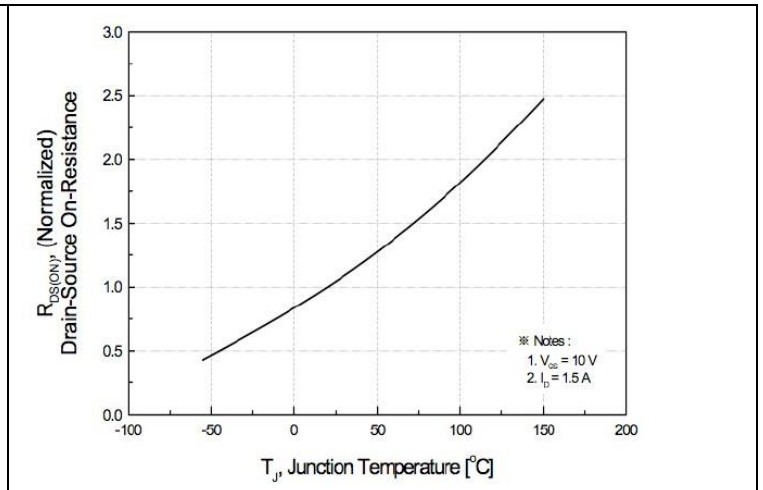


FIG. 8-ON-RESISTANCE VARIATION VS TEMPERATURE

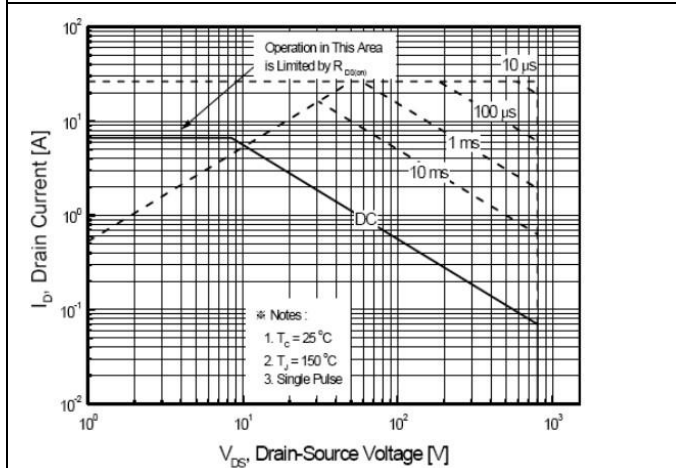


FIG. 9-MAXIMUM SAFE OPERATING AREA

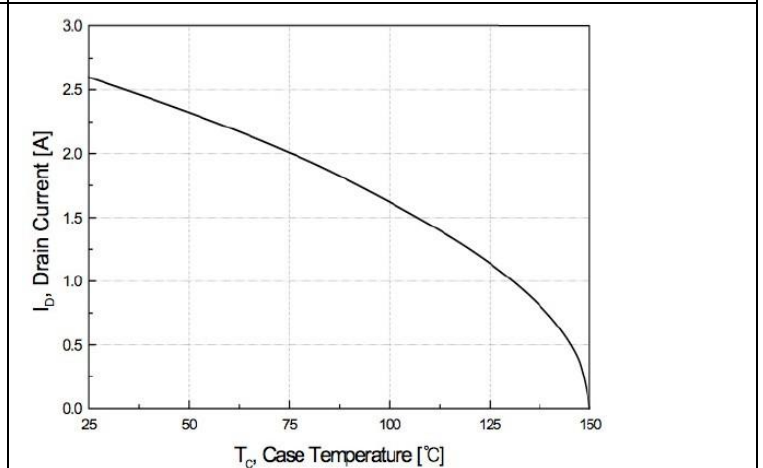


FIG. 10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

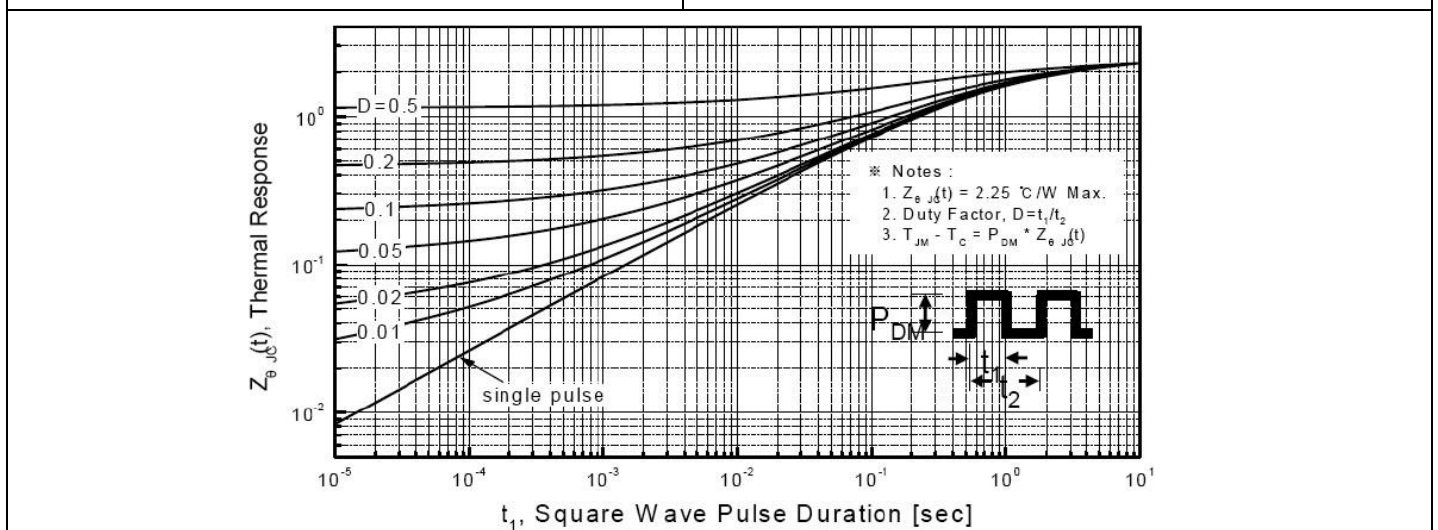


FIG. 11-TRANSIENT THERMAL RESPONSE CURVE

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Characteristics Test Circuit & Waveform

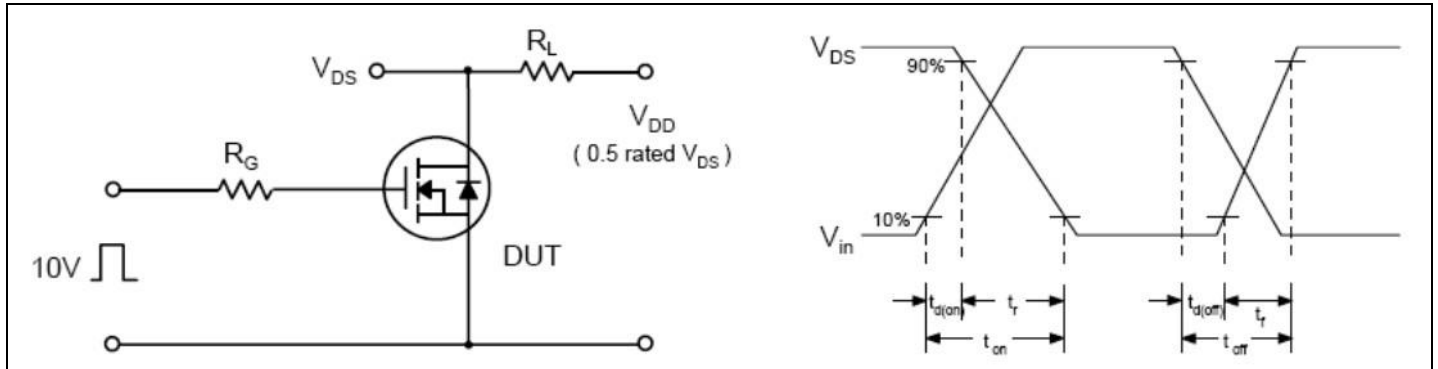


FIG.12-RESISTIVE SWITCHING TEST CIRCUIT & WAVEFORMS

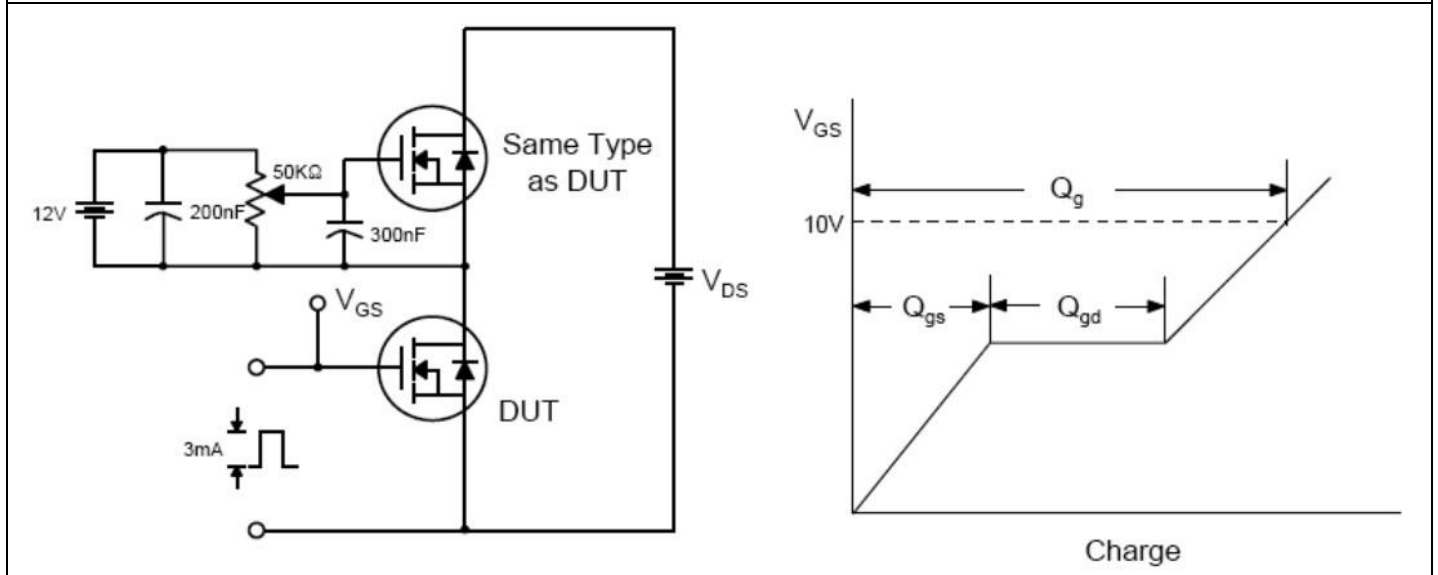


FIG.13-GATE CHARGE TEST CIRCUIT & WAVEFORM

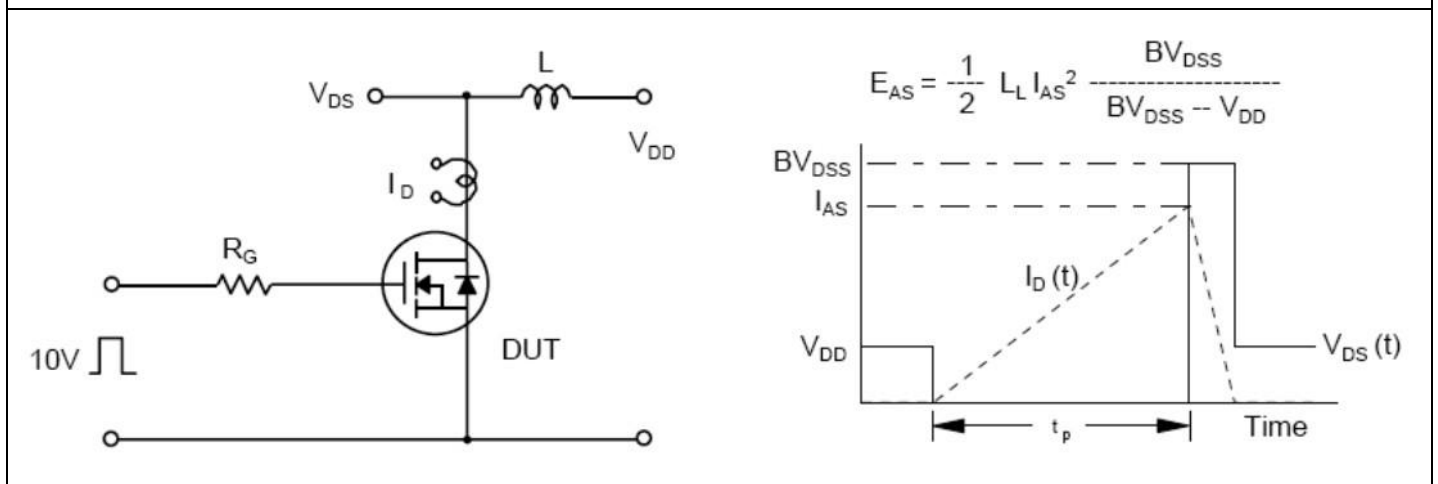


FIG.14-UNCLAMPED LINDUCTIVE SWITCHING TEST CIRCUIT & WAVEFORMS

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