MSD30N06

N-Channel 60-V (D-S) MOSFET

Description

The MSD30N06 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-252 package is universally preferred for all commercial-industrial applications

Features

- Low RDS (on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

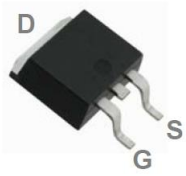
Applications

- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

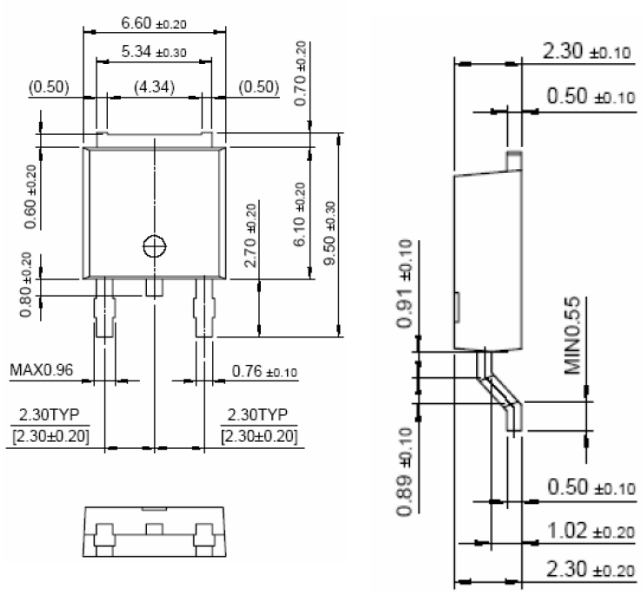
Packing & Order Information

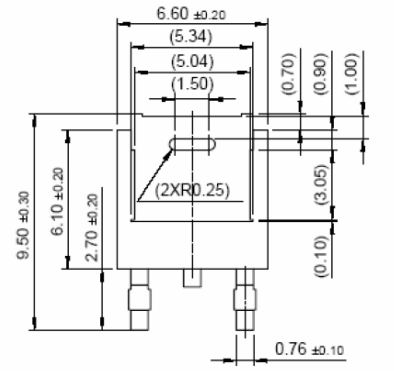
Part No./ T：2,500/Reel

Part No./ R：80/Tube , 4,000/Box

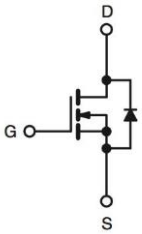


RoHS COMPLIANT





Graphic symbol



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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current @ TC=25°C	30	A
I_{DM}	Pulsed Drain Current[b]	100	A
I_S	Continuous Source Current (Diode Conduction)	30	A
P_W	Power Dissipation (TC=25°C)	50	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +175	°C

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

Symbol	Parameter	Maximum	Units
$R_{\theta JC}$	Maximum Junction-to-Case	3.0	°C/W
$R_{\theta JA}$	Maximum Junction-to-Ambient[a]	40	

Notes

a. Surface Mounted on 1” x 1” FR4 Board, drain pad using 2 oz copper, value dependent on PC board thermal characteristics

b. Pulse width limited by maximum junction temperature

Static

Symbol	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	--	--	V
$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 20 A V_{GS} = 4.5 V , I_D = 17 A	--	--	38 50	mΩ
I_{DSS}	V_{DS} = 48 V , V_{GS} = 0 V V_{DS} = 48 V , V_{GS} = 0 V , T_j = 55°C	--	--	1 25	uA
$I_{D(ON)}$	V_{DS} = 5 V, V_{GS} = 10 V	34	--	--	A
I_{GSS}	V_{DS} = 0 V , V_{GS} = 20 V	--	--	±100	nA
Gfs	V_{DS} = 15 V , I_D = 20 A	--	22	--	S
V_{SD}	I_S = 15 A, V_{GS} = 0 V	--	0.86	--	V

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Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	V_{DS} = 15 V, V_{GS} = 0 V, F = 1.0MHz	--	1711	--	pF
C_{OSS}		--	147	--	pF
C_{RSS}		--	134	--	pF
$t_{d(on)}$	V_{DD}= 30 V, I_D = 20 A, R_{GEN} = 6 Ω , V_{GEN} = 10 V R_L = 1.5 Ω	--	10	--	ns
t_r		--	12.8	--	ns
$t_{d(off)}$		--	53.1	--	ns
tf		--	18.6	--	ns
Q_g	V_{DS} = 30 V , I_D = 20 A, V_{GS} = 4.5 V	--	16.5	--	nC
Q_{gs}		--	5.3	--	nC
Q_{gd}		--	8.6	--	nC

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

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■Characteristics Curve

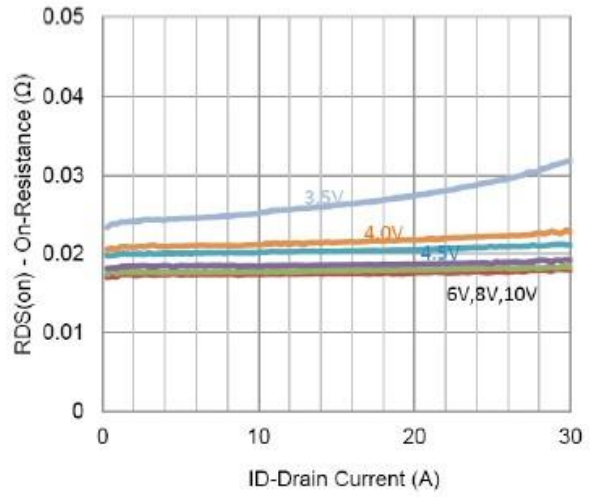

FIG.1-ON REGION CHARACTERISTICS

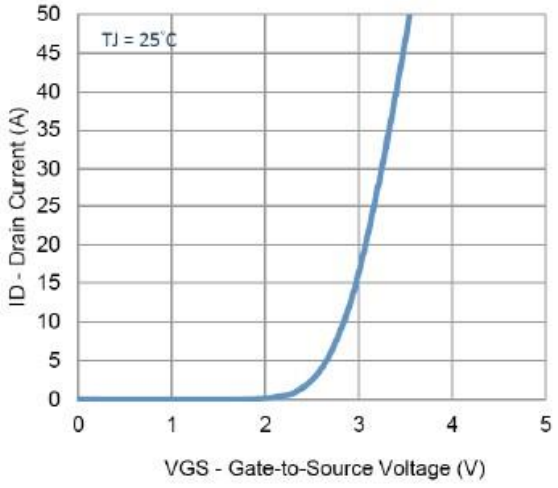

FIG.2-TRANSFER CHARACTERISTICS

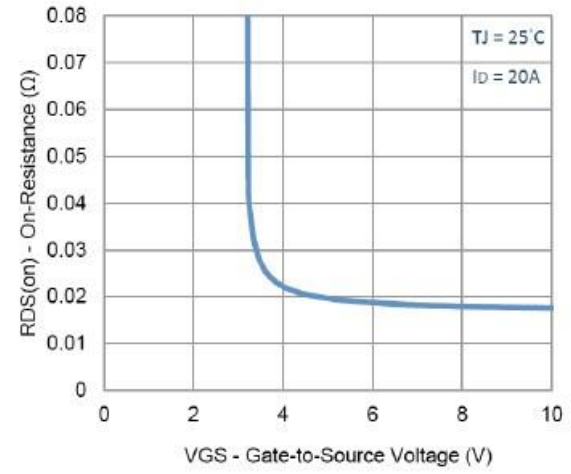

FIG.3-ON-RESISTANCE VS GATE-TO-SOURCE VOLTAGE

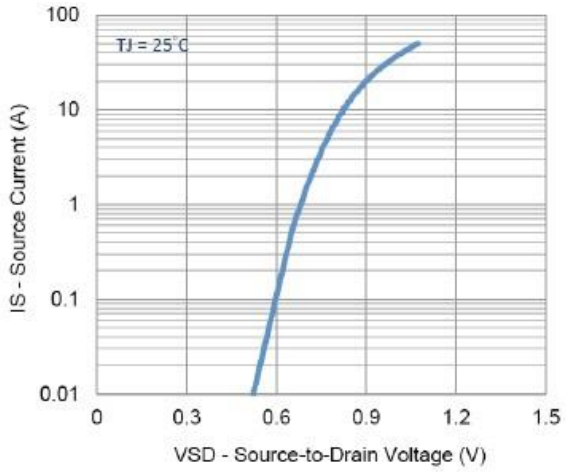

FIG.4-DRAIN-TO-SOURCE FORWARD VOLTAGE

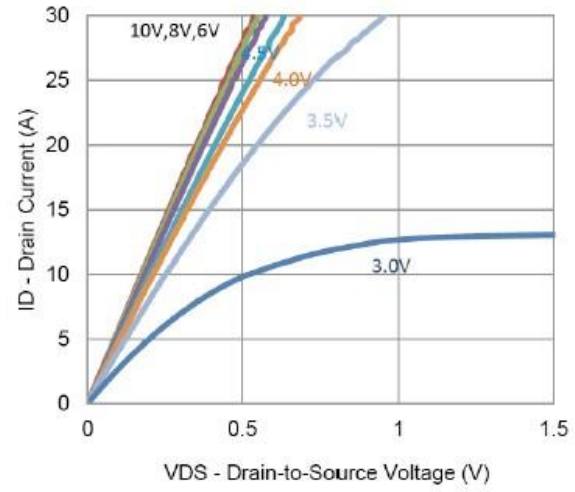

FIG.5-OUTPUT CHARACTERISTICS

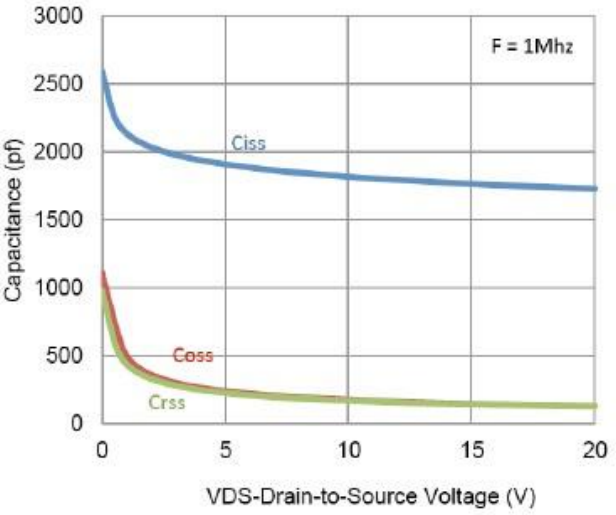

FIG.6-CAPACITANCE CHARACTERISTICS

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■Characteristics Curve

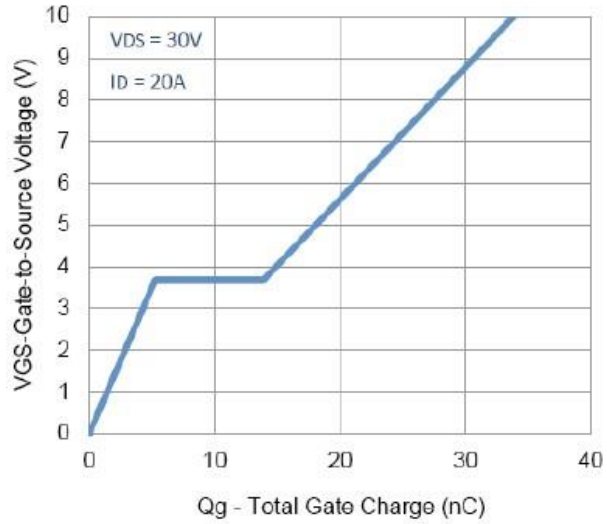

FIG.7-GATE CHARGE

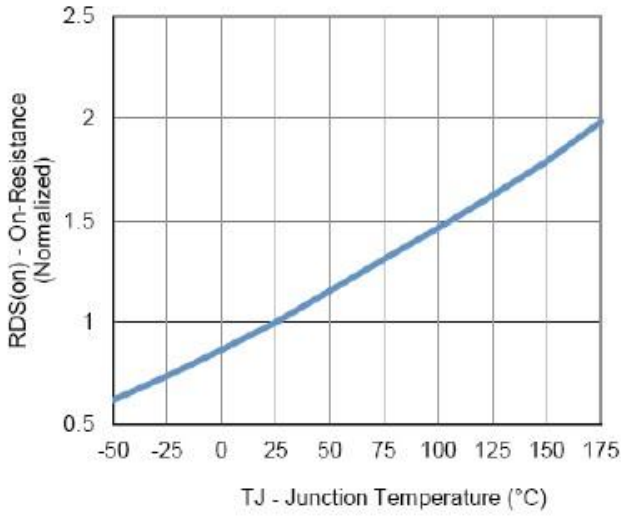

FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATION

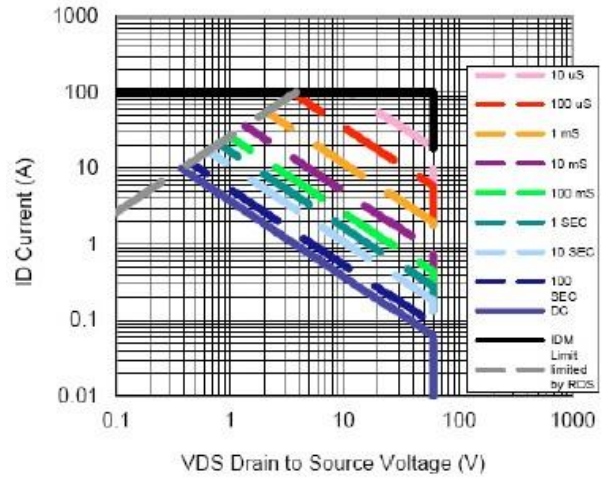

FIG.9-MAXIMUM SAFE OPERATING AREA

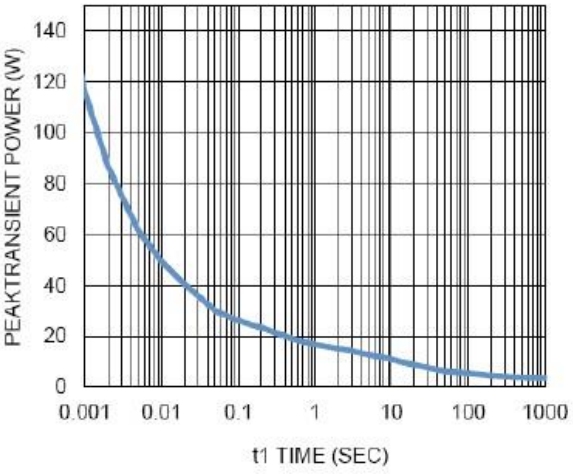

FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

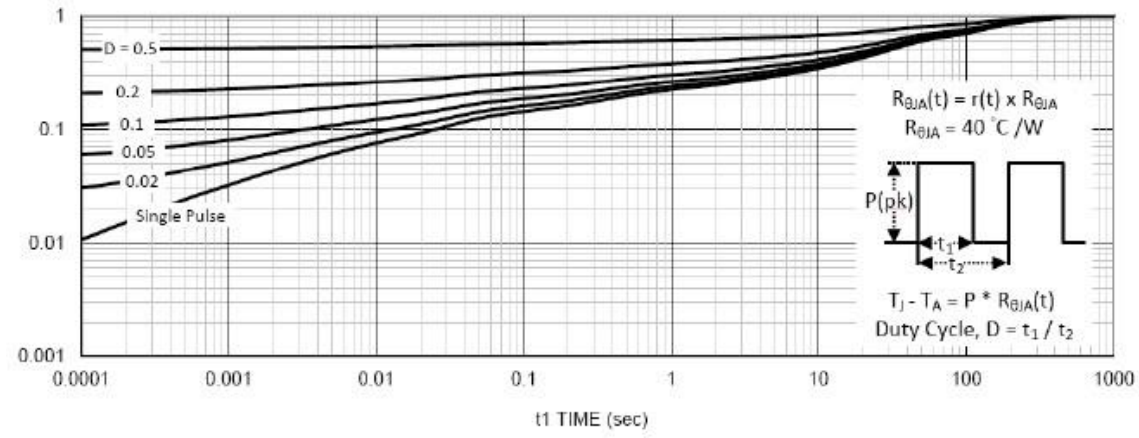

FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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■Characteristics Test Circuit & Waveform

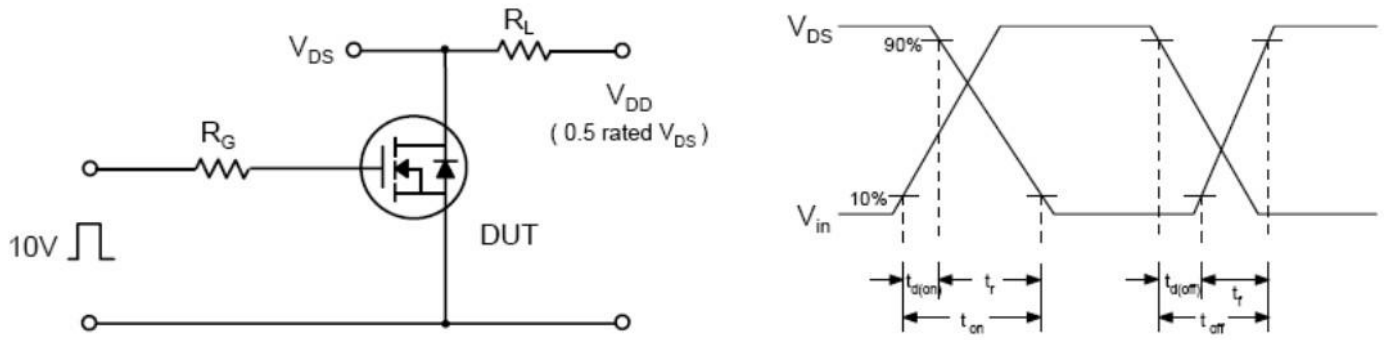

FIG.12-RESISTIVE SWITCHING TEST CIRCUIT & WAVEFORMS

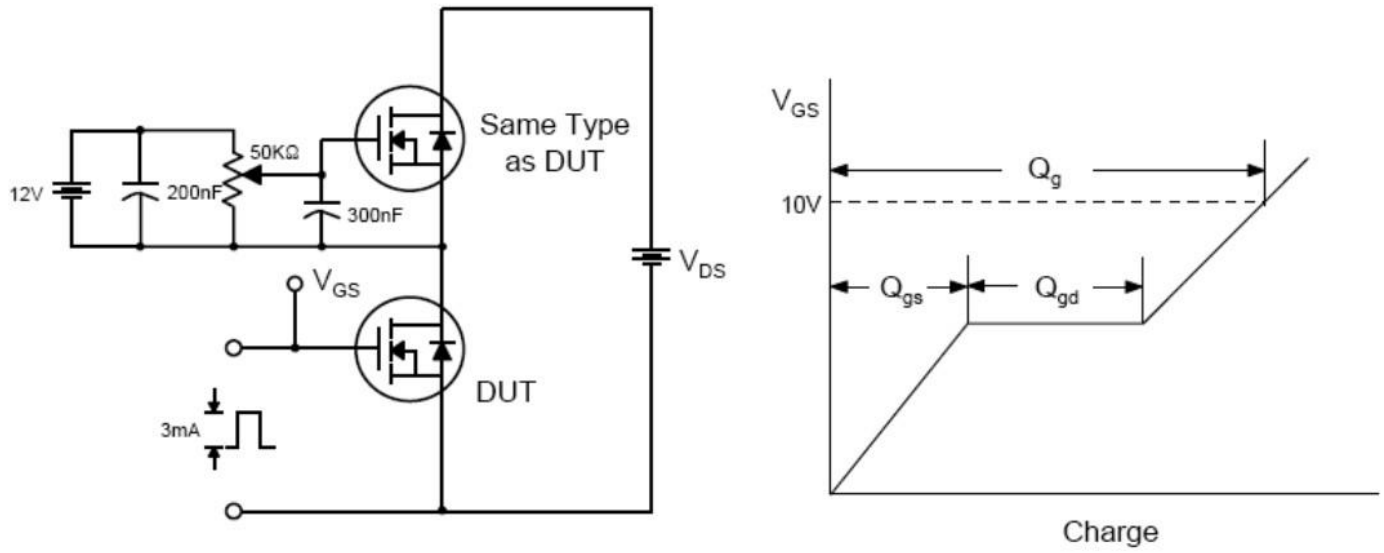

FIG.13-GATE CHARGE TEST CIRCUIT & WAVEFORM

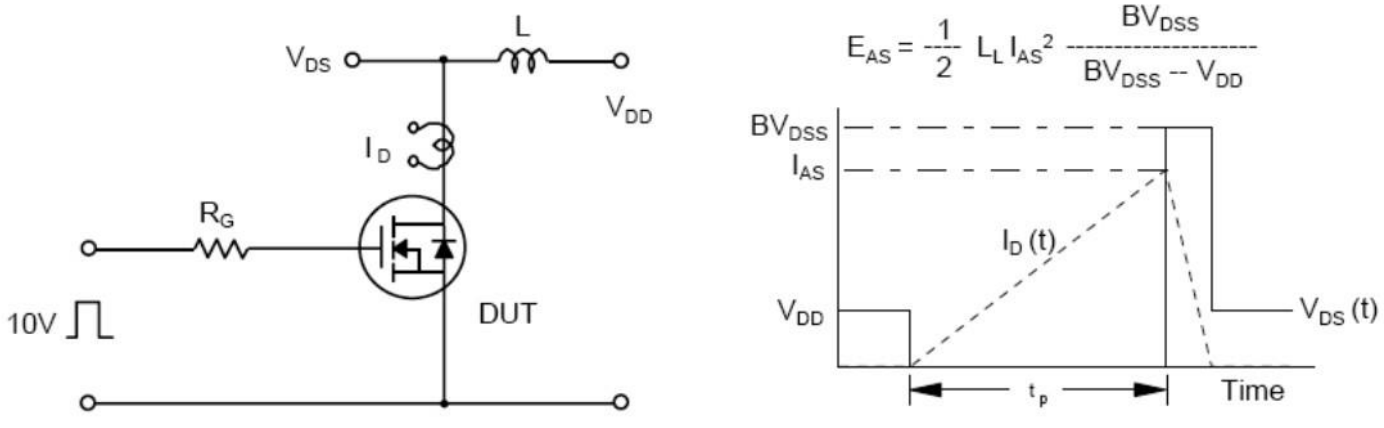

FIG.14-UNCLAMPED LINDUCTIVE SWITCHING TEST CIRCUIT & WAVEFORMS

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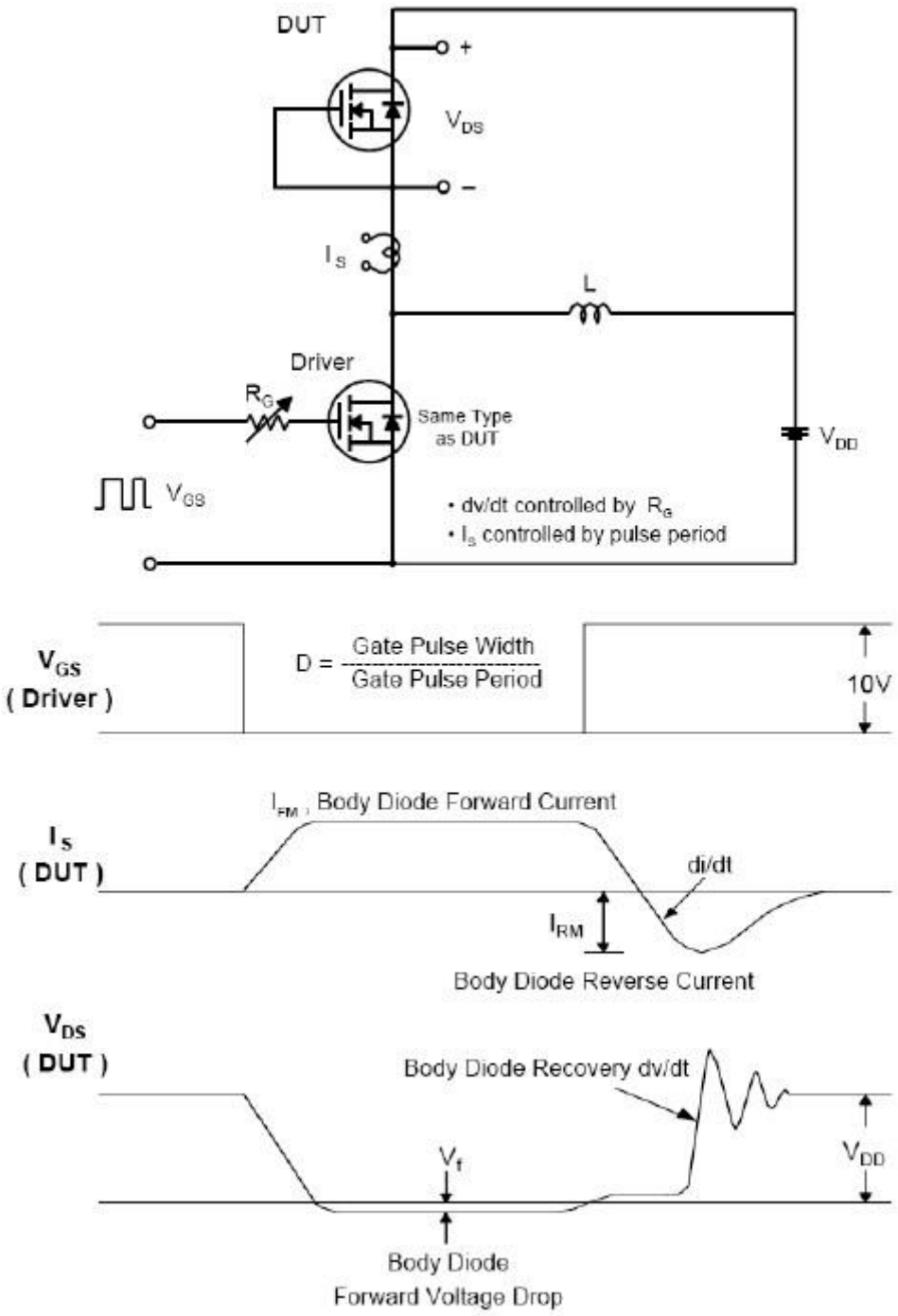

Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

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