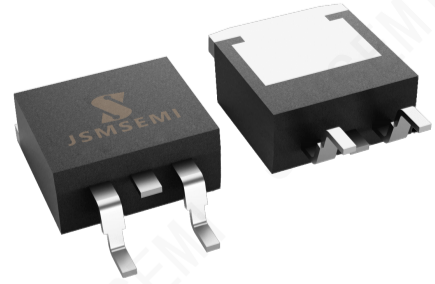


## Product Summary

- $V_{DS}$  100V
- $I_D$  75A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) <math>< 14m\Omega</math>
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

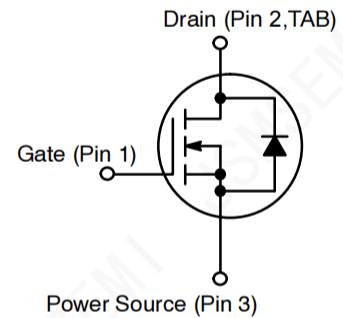


## General Description

- Vertical Double-diffused MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ , unless otherwise noted			
Parameter	Symbol	Value	Unit
		TO-263	
Drain-Source Voltage ( $V_{GS} = 0V$ )	$V_{DSS}$	100	V
Continuous Drain Current	$I_D$	75	A
Pulsed Drain Current (note 1)	$I_{DM}$	300	A
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Single Pulse Avalanche Energy (note2)	$E_{AS}$	243	mJ
Avalanche Current (note1)	$I_{AR}$	40	A
Repetitive Avalanche Energy (note1)	$E_{AR}$	46	mJ
Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_D$	250	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

Thermal Resistance			
Parameter	Symbol	Value	Unit
		TO-263	
Thermal Resistance, Junction-to-Case	$R_{thJC}$	0.8	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	80	

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	$\mu A$
		$V_{DS} = 80V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	--	--	100	
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = +20V, V_{DS} = 0V$	--	--	100	nA
		$V_{GS} = -20V, V_{DS} = 0V$	--	--	-100	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	--	4.0	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$	--	11	14	m $\Omega$
Forward Transconductance	gfs	$V_{DS} = 10V, I_D = 40A$		35		S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 25V,$ $f = 1.0MHz$	--	6100	--	$\mu F$
Output Capacitance	$C_{oss}$		--	410	--	
Reverse Transfer Capacitance	$C_{rss}$		--	260	--	
Total Gate Charge	$Q_g$	$V_{DD} = 50V, I_D = 45A,$ $V_{GS} = 0 \text{ to } 10V$	--	150	--	nC
Gate-Source Charge	$Q_{gs}$		--	25	--	
Gate-Drain Charge	$Q_{gd}$		--	75	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V,$ $I_D = 45A,$ $V_{GS} = 10V$ $R_G = 2.5 \Omega$	--	28	--	ns
Turn-on Rise Time	$t_r$		--	88	--	
Turn-off Delay Time	$t_{d(off)}$		--	75	--	
Turn-off Fall Time	$t_f$		--	25	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	75	A
Pulsed Diode Forward Current	$I_{SM}$		--	--	300	
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 45A, V_{GS} = 0V$	--	--	1.3	V
Reverse Recovery Time	$t_{rr}$	$V_{GS} = 0V, I_S = 45A,$ $di_f/dt = 100A/\mu s$	--	195	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	107	--	$\mu C$

- Notes**
1. Repetitive Rating: Pulse width limited by maximum junction temperature
  2.  $I_{AS} = 30A, V_{DD} = 50V, R_G = 25 \Omega$ , Starting  $T_J = 25^\circ\text{C}$
  3. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$

## Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
HUF75645S3ST-JSM	TO-263	75645S	-55 to 175 $^\circ\text{C}$	1	T&R, 800	RoHS

Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

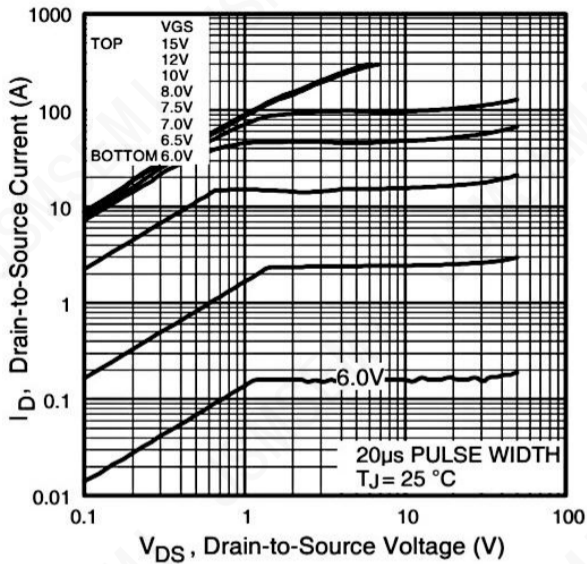


Fig 1. Typical Output Characteristics

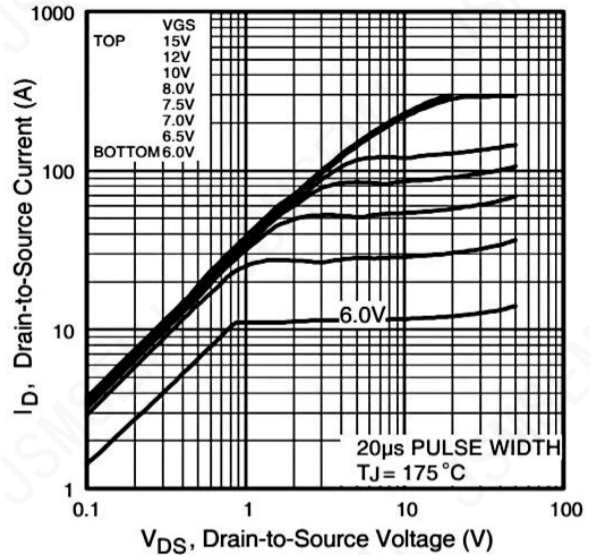


Fig 2. Typical Output Characteristics

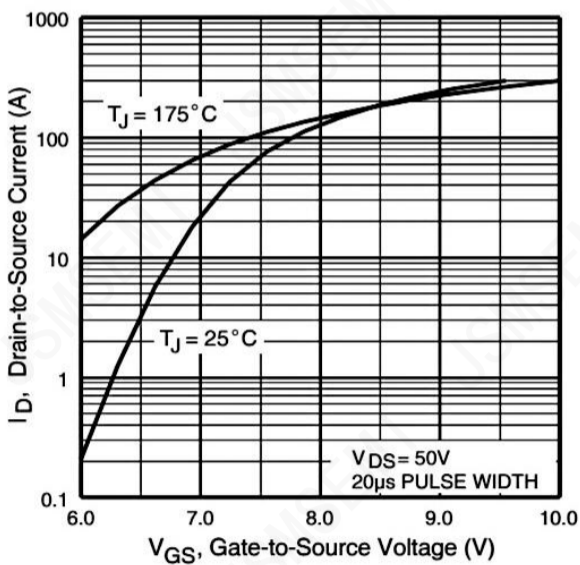


Fig 3. Typical Transfer Characteristics

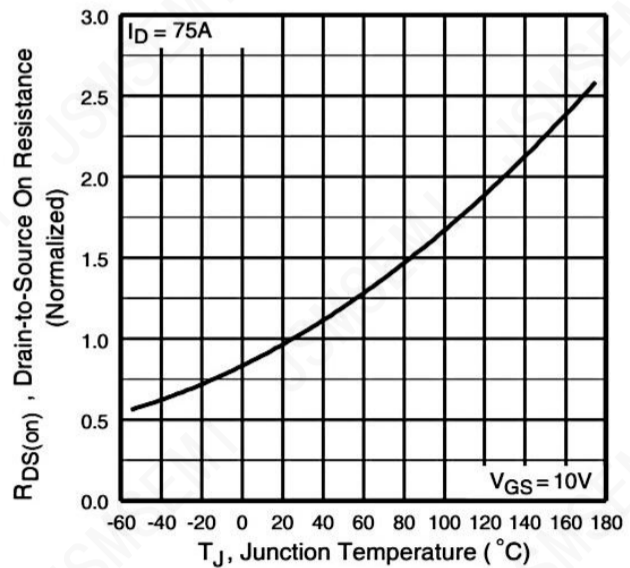
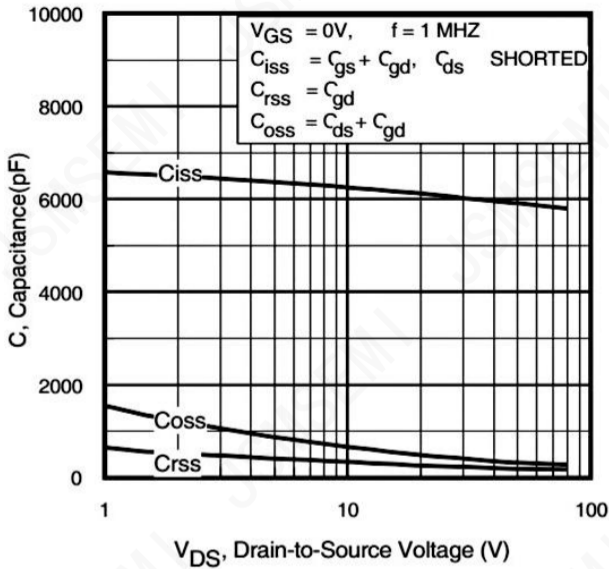
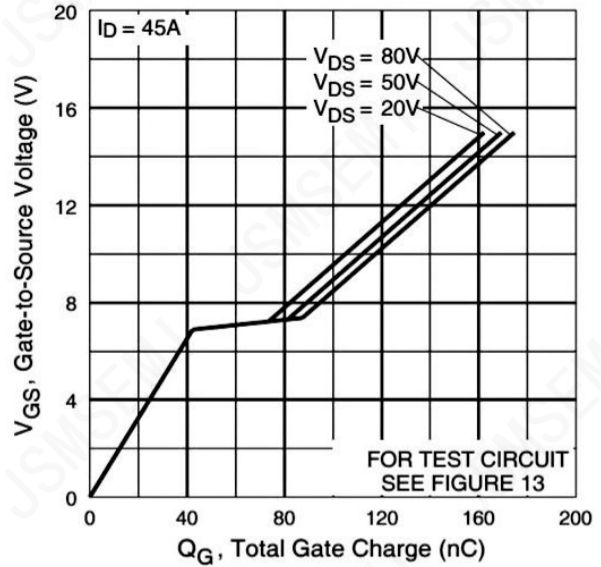


Fig 4. Normalized On-Resistance Vs. Temperature

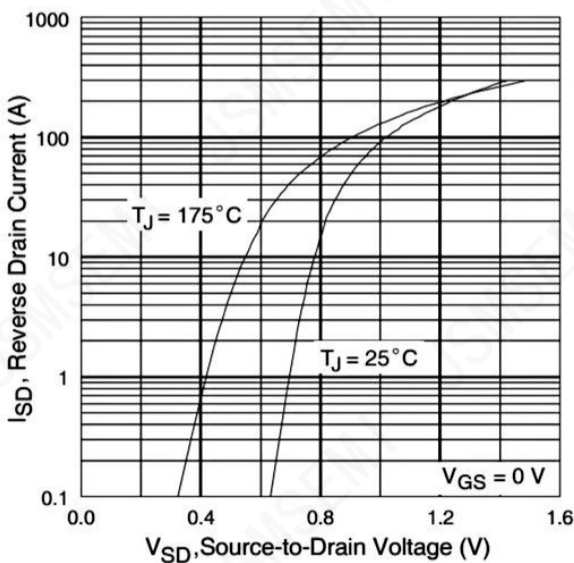
Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted



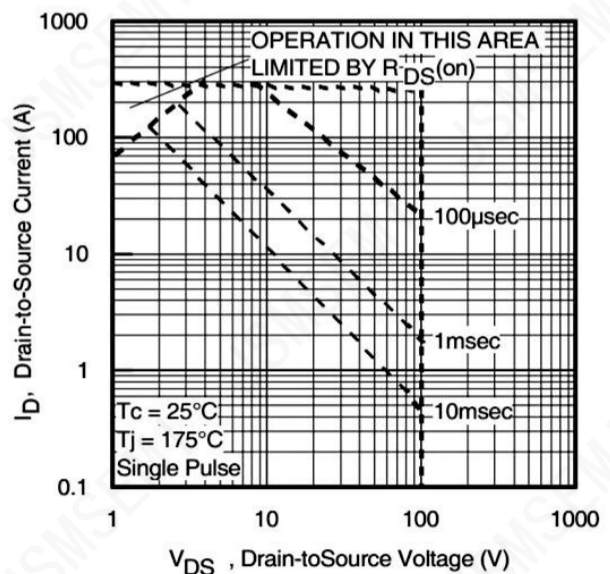
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage

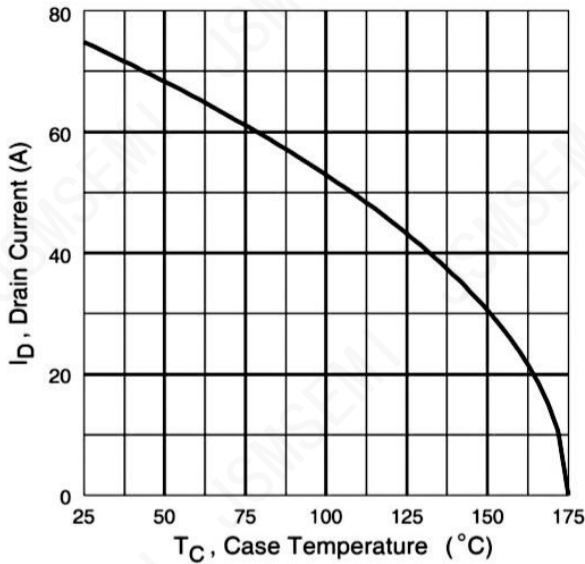


**Fig 7.** Typical Source-Drain Diode Forward Voltage

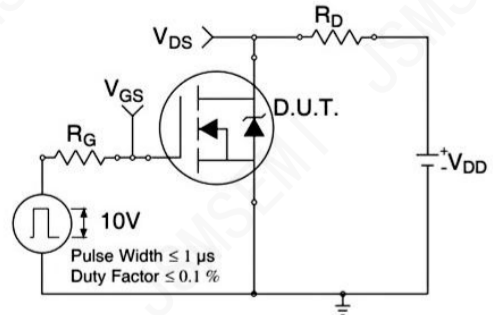


**Fig 8.** Maximum Safe Operating Area

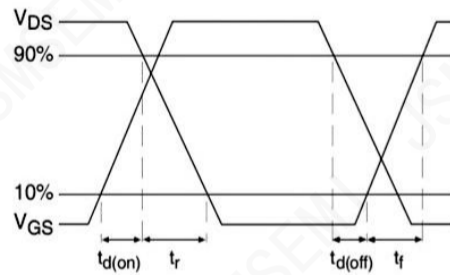
Typical Characteristics  $T_j = 25^\circ\text{C}$ , unless otherwise noted



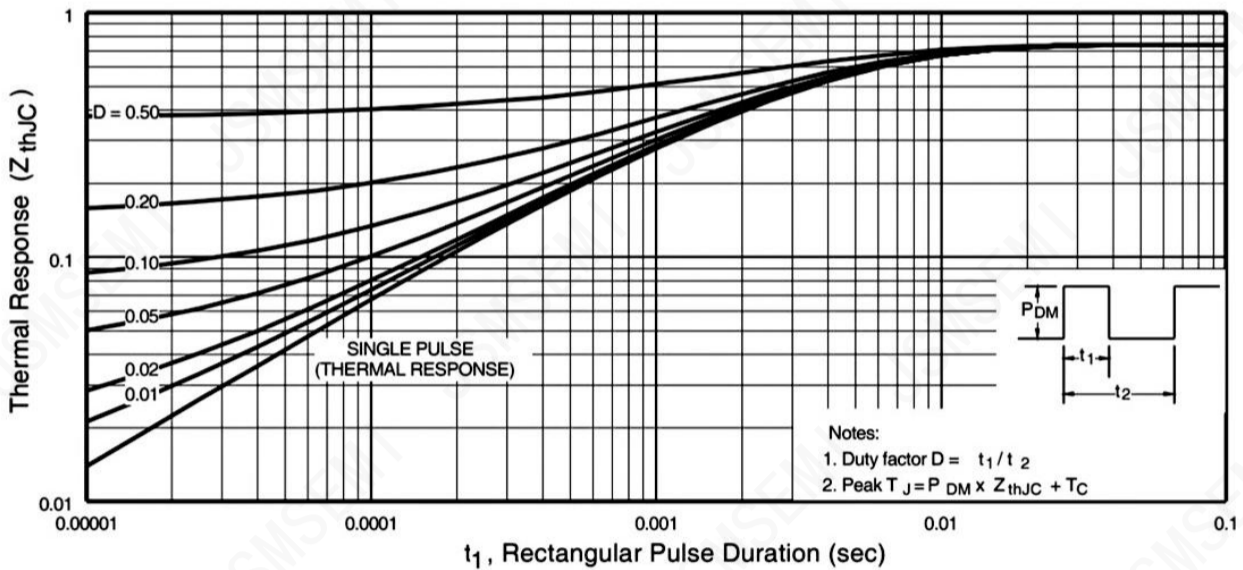
**Fig 9.** Maximum Drain Current Vs. Case Temperature



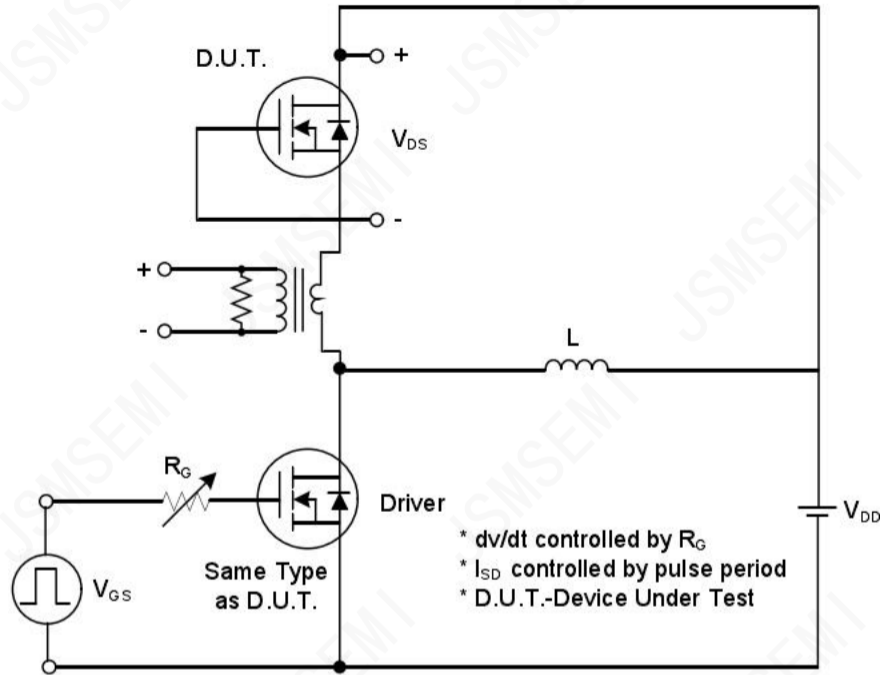
**Fig 10a.** Switching Time Test Circuit



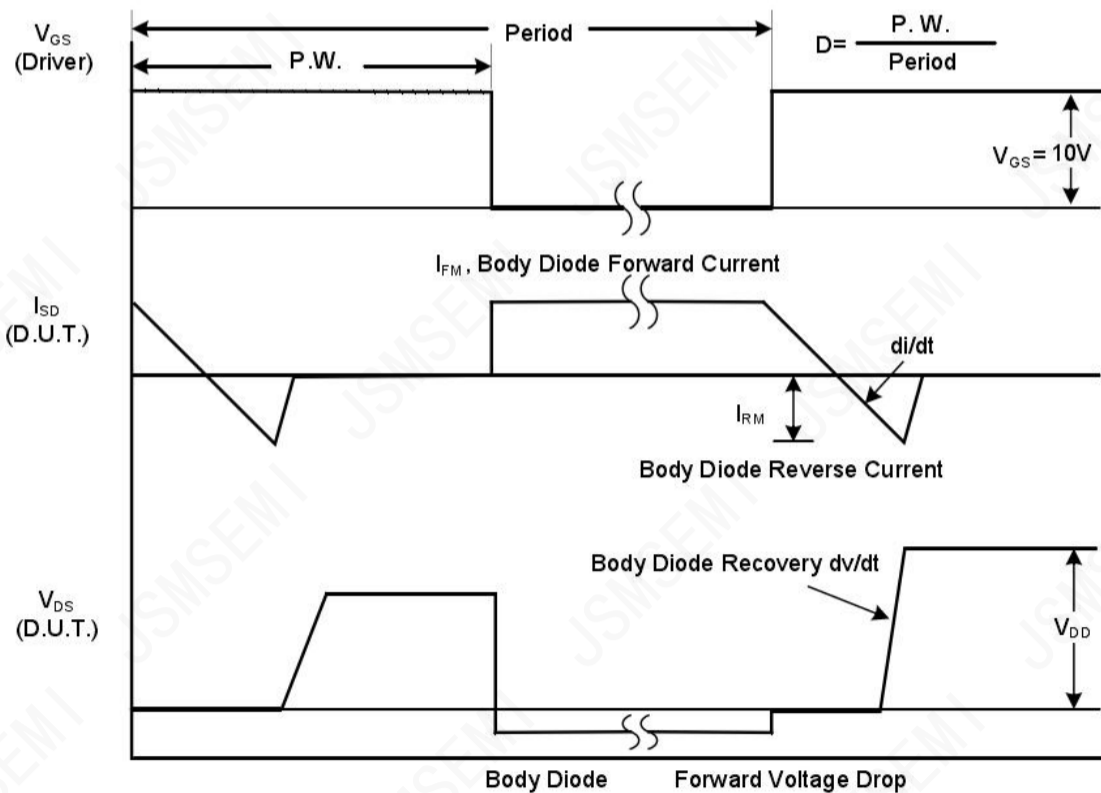
**Fig 10b.** Switching Time Waveforms



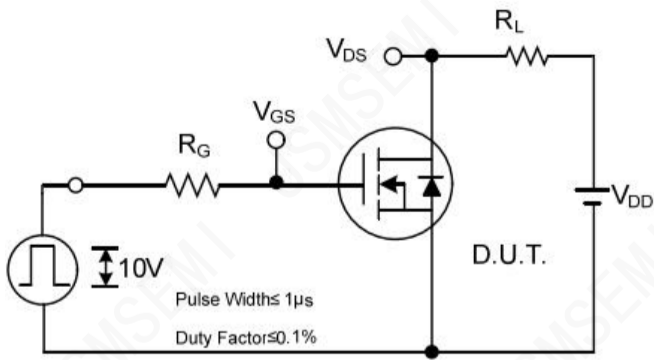
**RATING AND CHARACTERISTIC CURVES**



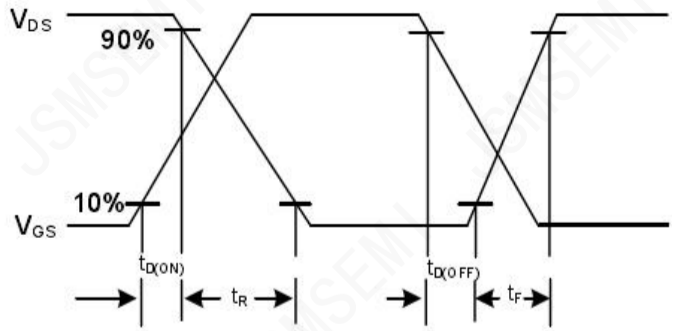
**Peak Diode Recovery  $dv/dt$  Test Circuit**



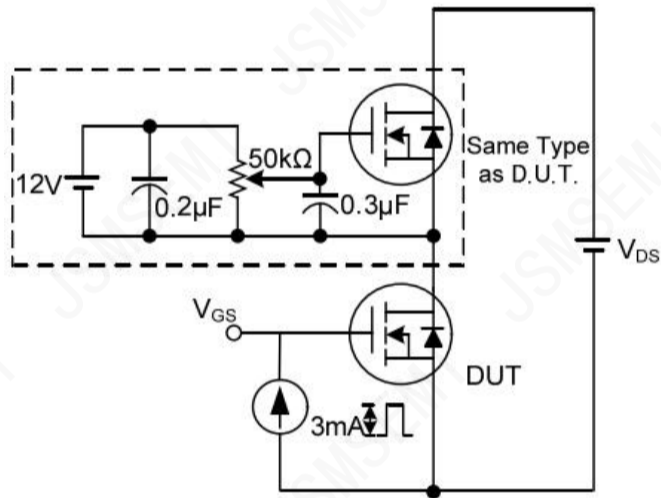
**Peak Diode Recovery  $dv/dt$  Waveforms**



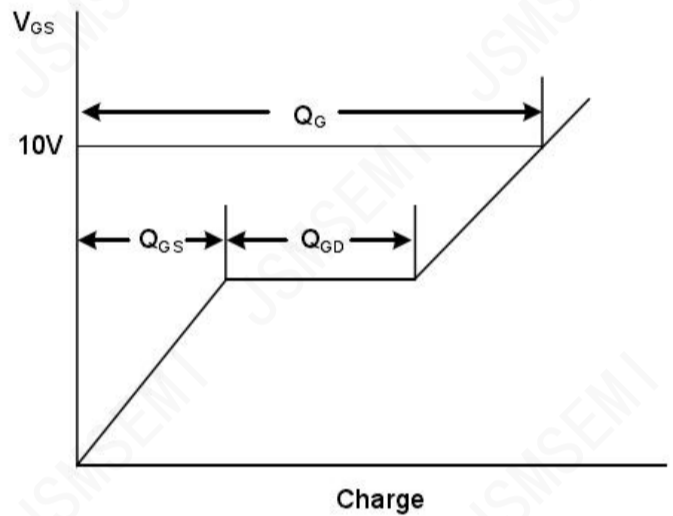
**Switching Test Circuit**



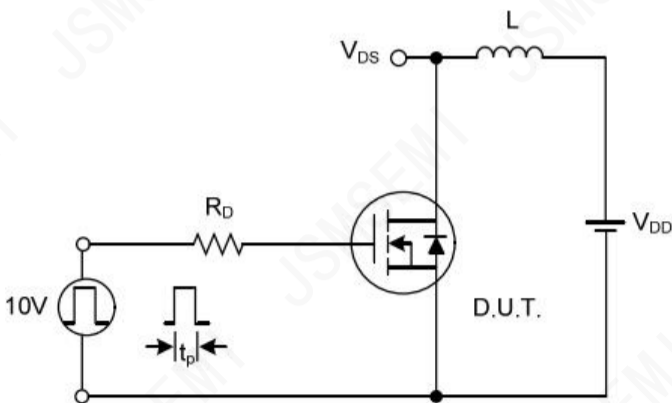
**Switching Waveforms**



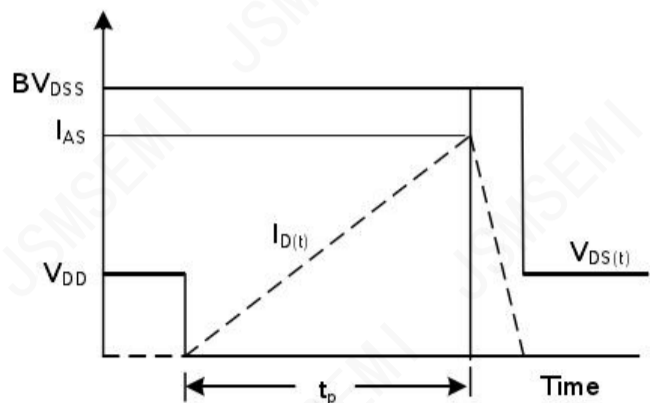
**Gate Charge Test Circuit**



**Gate Charge Waveform**



**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

Figure A: Gate Charge Test Circuit and Waveform

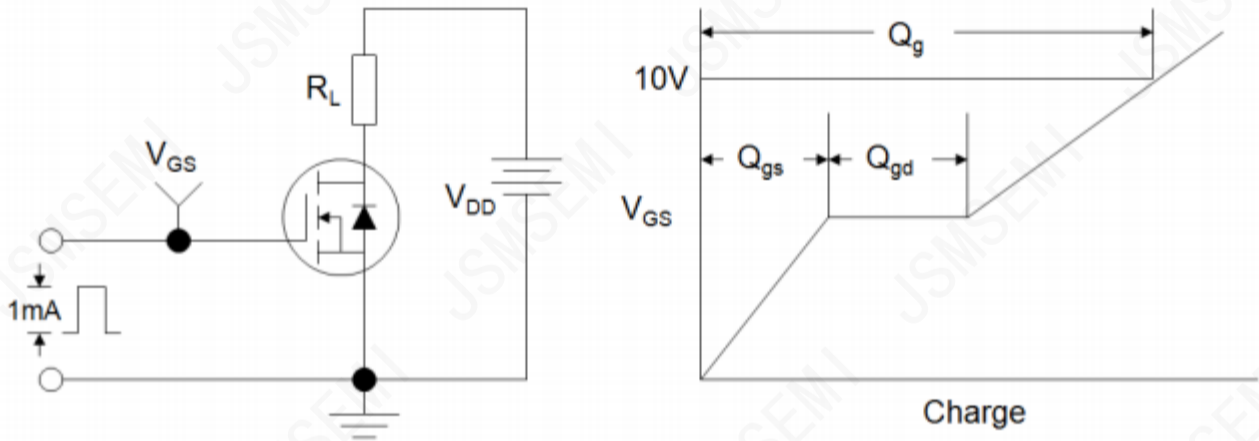


Figure B: Resistive Switching Test Circuit and Waveform

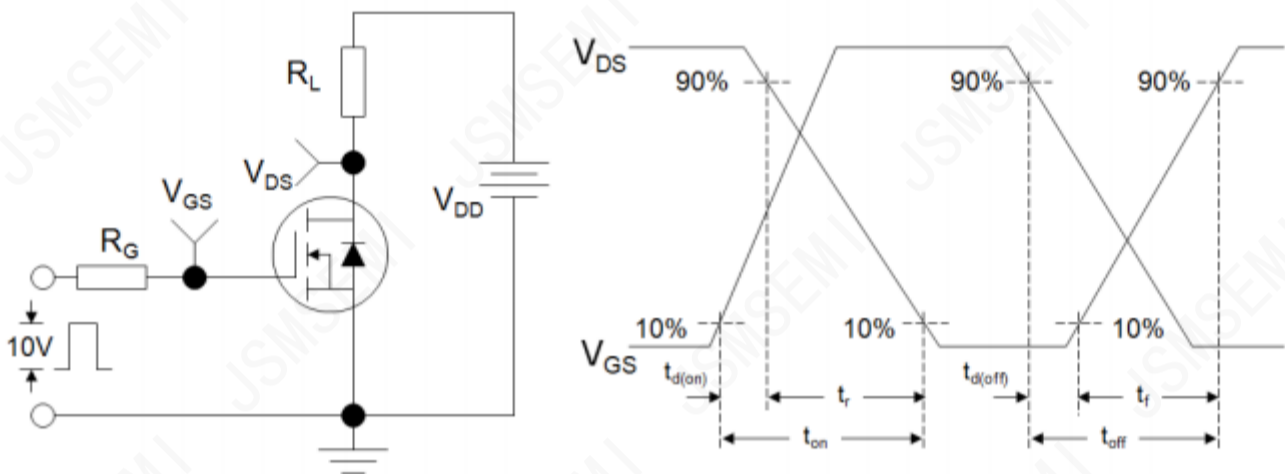
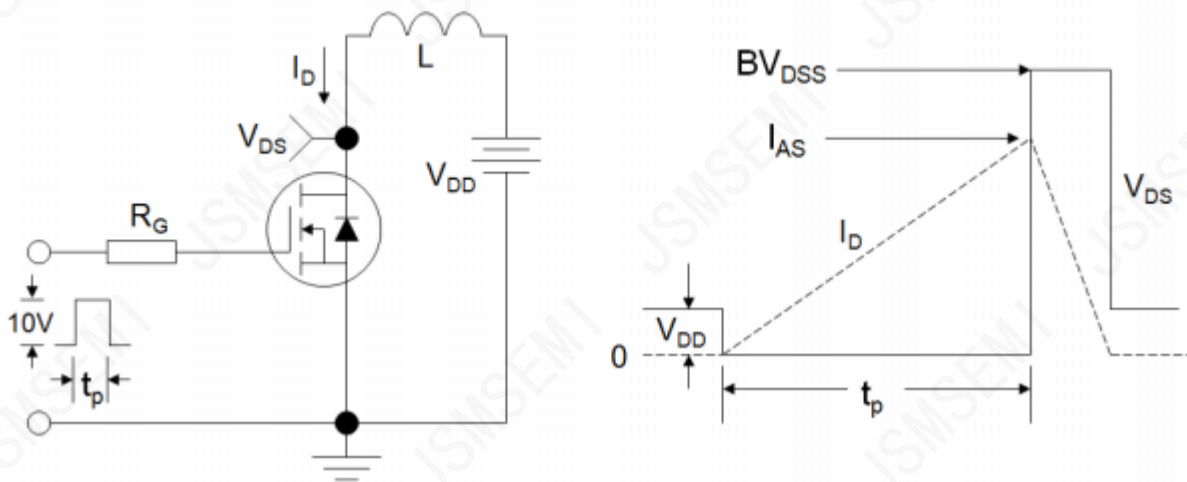
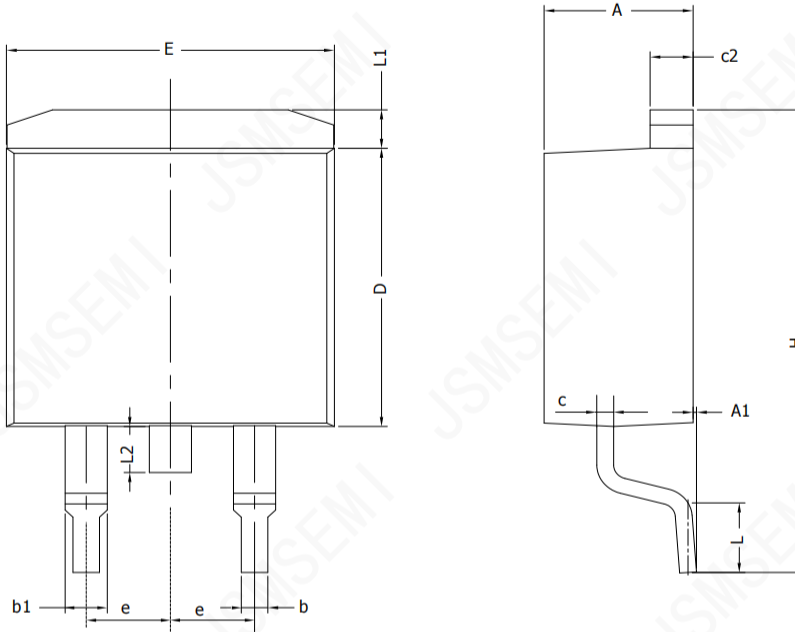


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



**Package Information**



SYMBOL	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
c	0.30	---	0.60
c2	1.17	1.27	1.37
D	8.50	---	9.35
E	9.80	---	10.45
e	2.54BSC		
H	14.70	---	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	---	---	1.75

## Revision History

Rev.	Change	Date
V1.0	Initial version	3/11/2019

## Important Notice

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