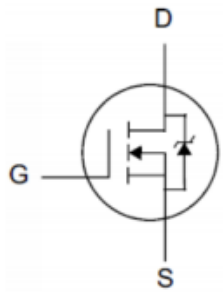
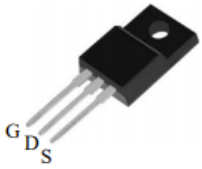
XTMS60R160F

600V N-ch Planar MOSFET

封装 **Package**





TO-220F

Product Description

BV_{DSS}	600	V
I_D	20	A
$R_{DS(ON),Typ.}$	0.16	Ω

General Features

- RoHS Compliant
- $R_{DS(ON),typ.}$=0.16Ω@V_{GS}=10V
- Fast Recovery Body Diode
- Low Gate Charge Minimize Switching Loss

Applications

- Adaptor
- Charger
- SMPS Standby Power

Device	Package	Marking
XTMS60R160F	TO-220F	XTMS60R160F

Absolute Maximum Ratings T_j=25℃

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	600	V
V_{GSS}	Gate-to-Source Voltage	±30	
I_D	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current at V_{GS}=10V	80	
E_{AS}	Single Pulse Avalanche Energy	663	mJ
P_D	Power Dissipation	45	W
	Derating Factor above 25℃	663	W/℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	℃

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.8	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	℃/W

Electrical Characteristics T_j=25℃

OFF Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
BV_{DSS}	Drain-to-Source Breakdown Voltage	600	-	-	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	-	-	1.0	uA	V_{DS}=600V, V_{GS}=0V
		-	3.0	-		V_{DS}=600V, V_{GS}=0V, T_J=125℃
I_{GSS}	Gate-to-Source Leakage Current	-	-	+100	nA	V_{GS}=+30V, V_{DS}=0V
		-	-	-100		V_{GS}=-30V, V_{DS}=0V

ON Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	-	0.16	0.19	Ω	V_{GS}=10V, I_D=10A
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	-	4.0	V	V_{DS}=V_{GS}, I_D=250uA

Dynamic Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
C_{iss}	Input Capacitance	-	1776	-	pF	V_{GS}=0V, V_{DS}=100V, f=1.0MH$_Z$
C_{rss}	Reverse Transfer Capacitance	-	65	-		
C_{oss}	Output Capacitance	-	1.2	-		
Q_g	Total Gate Charge	-	46	-	nC	V_{DD}=480V, I_D=20A, V_{GS}=10V
Q_{gs}	Gate-to-Source Charge	-	15	-		
Q_{gd}	Gate-to-Drain (Miller) Charge	-	20	-		

Resistive Switching Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
$td_{(ON)}$	Turn-on Delay Time	-	30	-	ns	V_{DD}=3000V, I_D=20A, V_{GS}=10V Rg=250Ω
t_{rise}	Rise Time	-	64	-		
$td_{(OFF)}$	Turn-Off Delay Time	-	119	-		
t_{fall}	Fall Time	-	49	-		

Source-Drain Body Diode Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
V_{SD}	Diode Forward Voltage	-	-	1.4	V	I_S=20A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	385	-	ns	V_{GS}=0V I_S=20A, di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	-	5.8	-	uC	

[1] Pulse width≤380μs; duty cycle≤2%

Typical Characteristics

图1. 输出特性

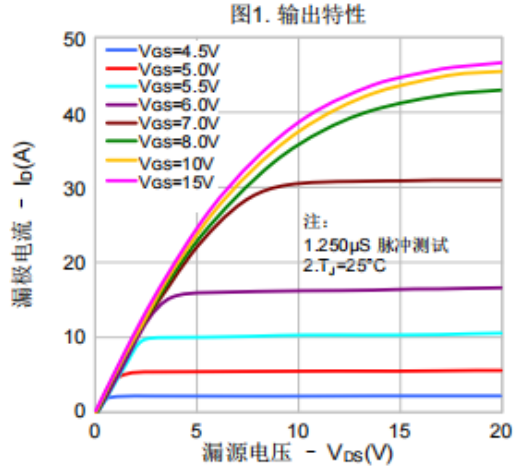


图2. 输出特性

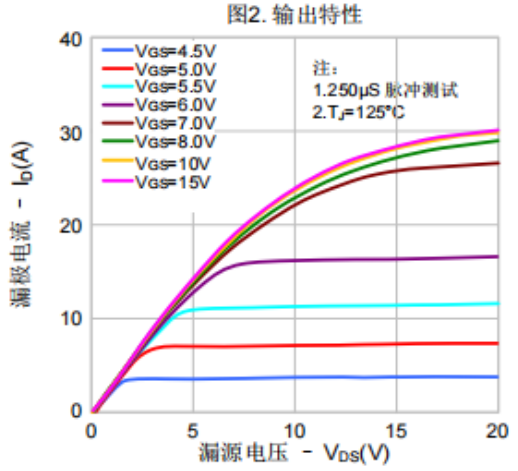


图3. 传输特性

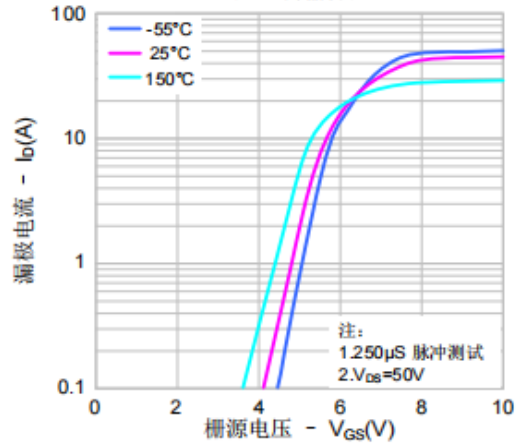


图4. 导通电阻vs.漏极电流

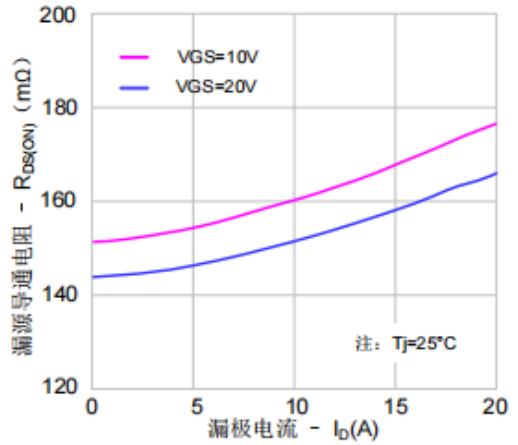


图5. 导通电阻vs.栅源电压

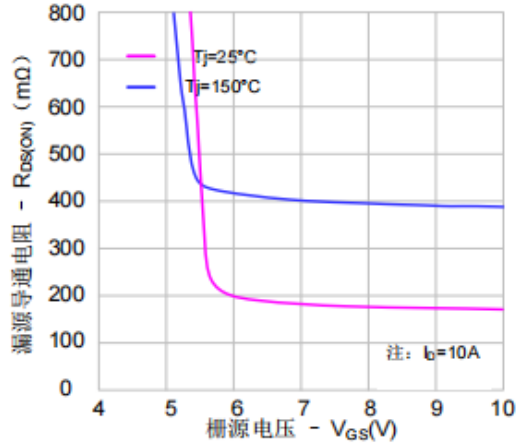
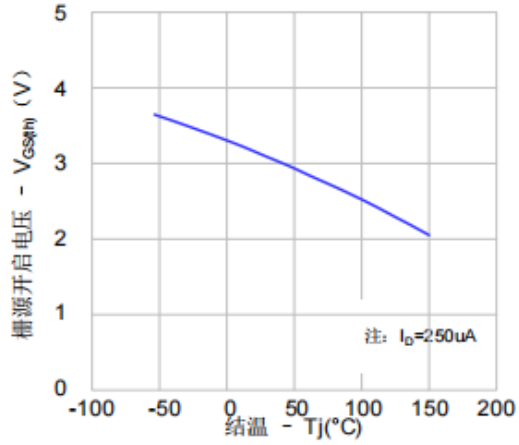


图6. 开启电压vs.温度特性



Typical Characteristics(Cont.)

图7. 体二极管正向压降vs. 源极电流、温度

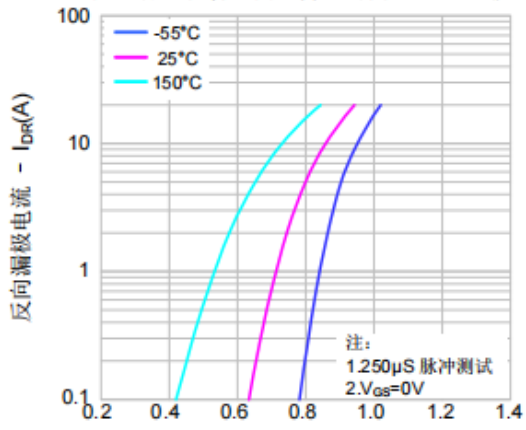


图8. 电容特性

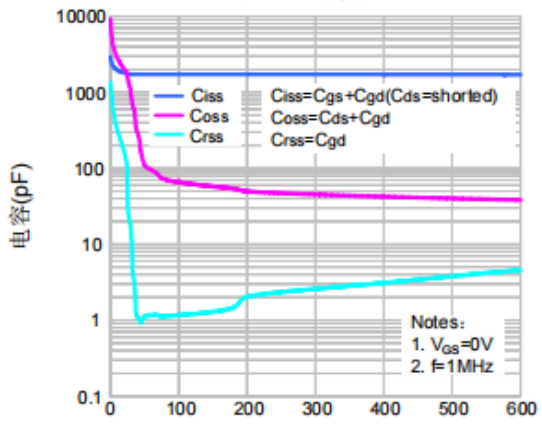


图9. 电荷量特性

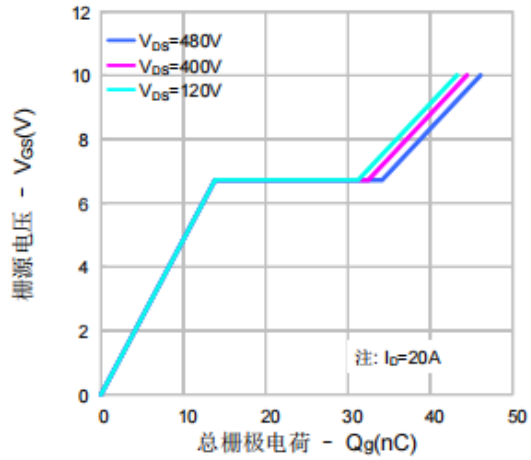


图10. 击穿电压vs.温度特性

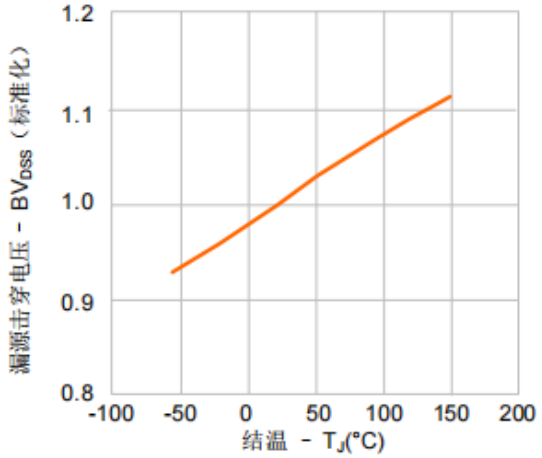


图11. 导通电阻vs.温度特性

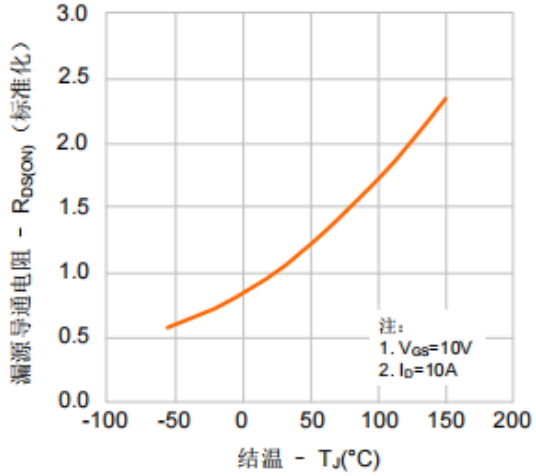
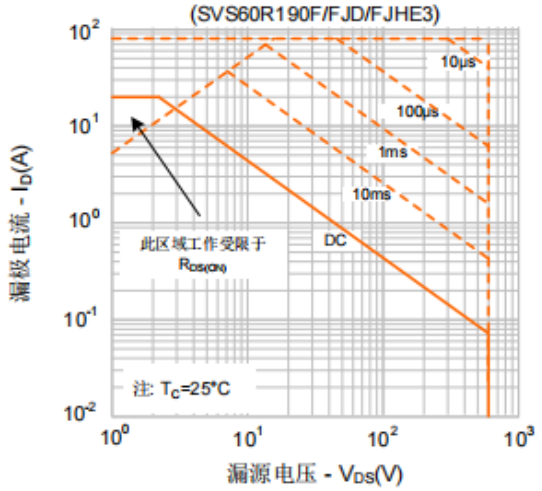


图12-1. 最大安全工作区
(SVS60R190F/FJD/FJHE3)



Typical Characteristics(Cont.)

图12-2. 最大安全工作区
(SVS60R190KE3)

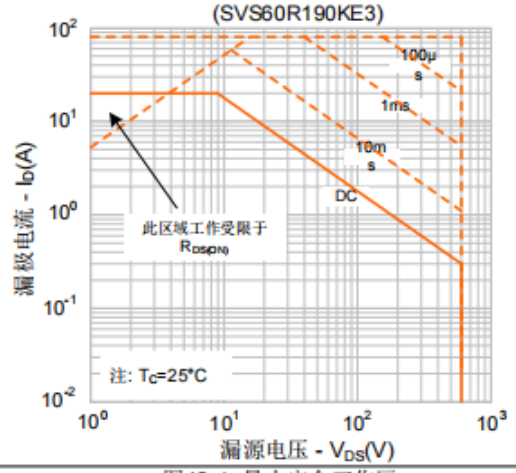


图12-3. 最大安全工作区
(SVS60R190PNE3)

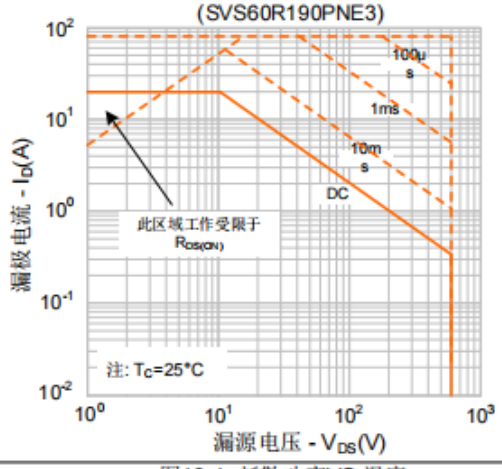


图12-4. 最大安全工作区
(SVS60R190L8AE3)

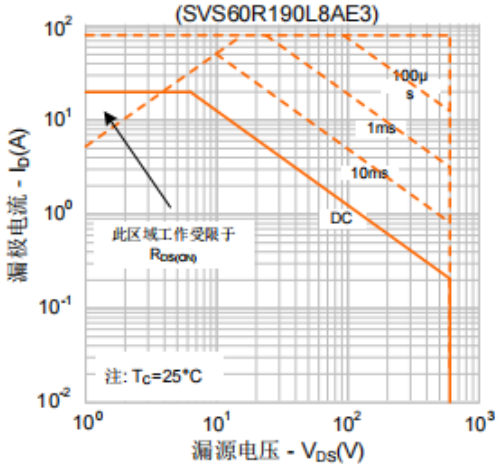


图13-1. 耗散功率VS.温度
(SVS60R190F/FJD/FJHE3)

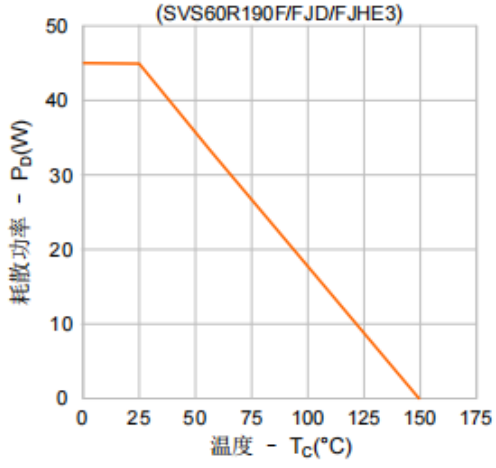


图13-2. 耗散功率VS.温度
(SVS60R190KE3)

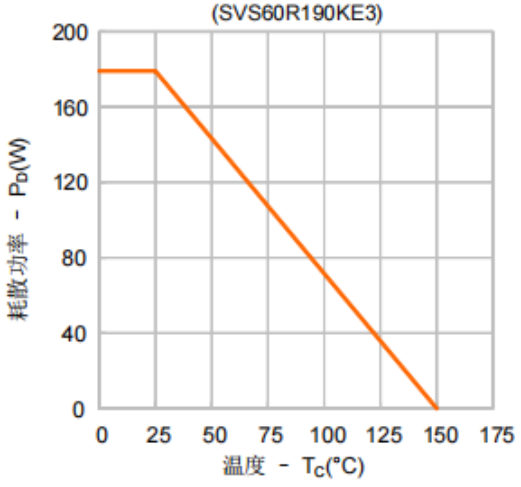
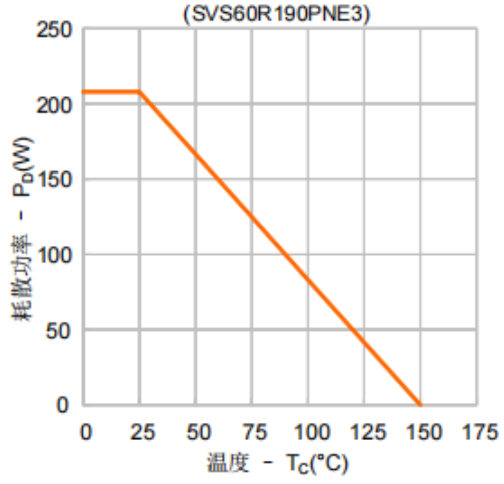
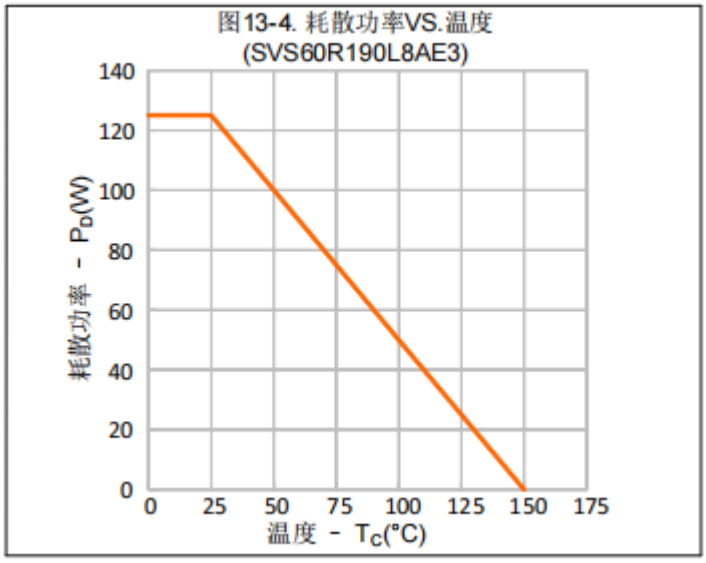


图13-3. 耗散功率VS.温度
(SVS60R190PNE3)



Typical Characteristics(Cont.)



Test Circuits and Waveforms

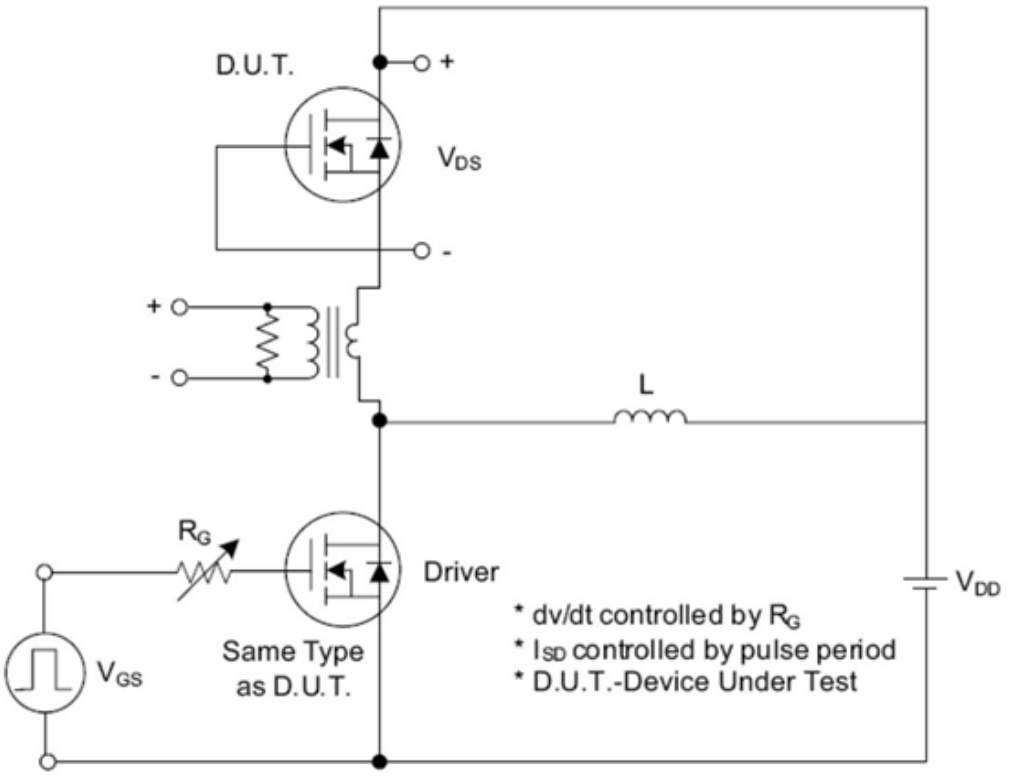


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

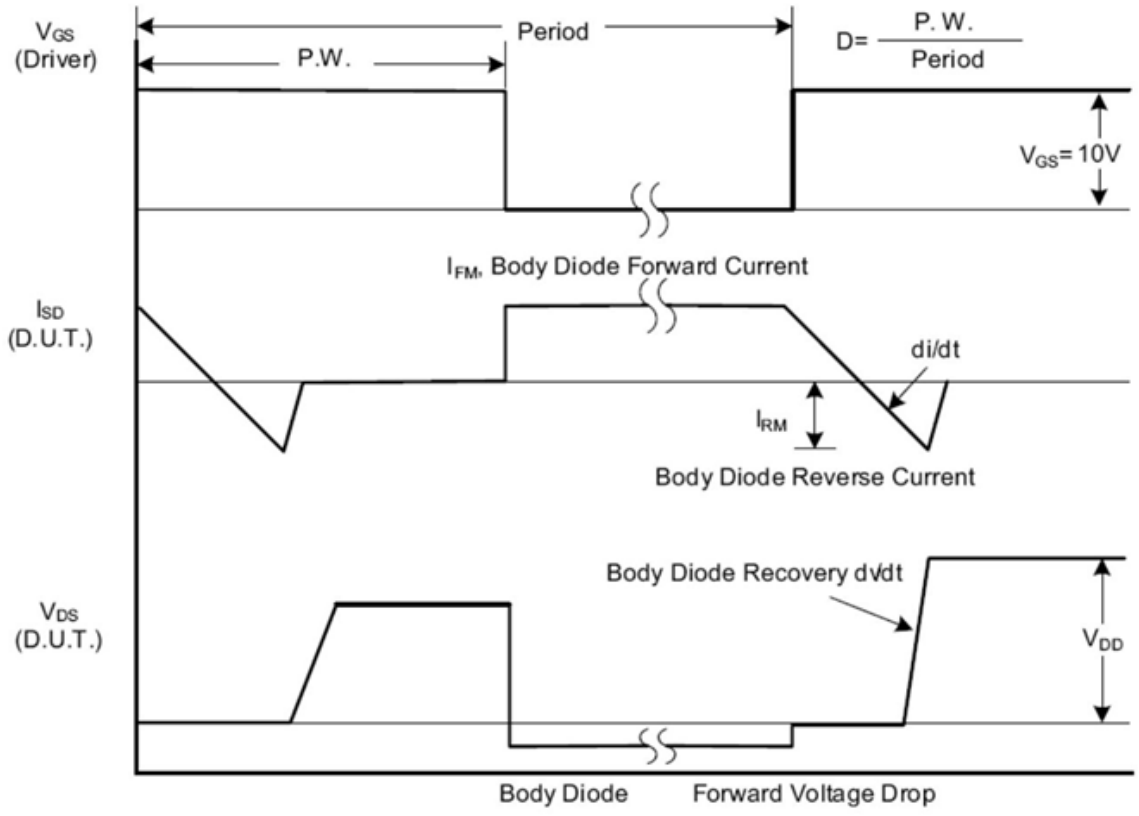


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

Test Circuits and Waveforms (Cont.)

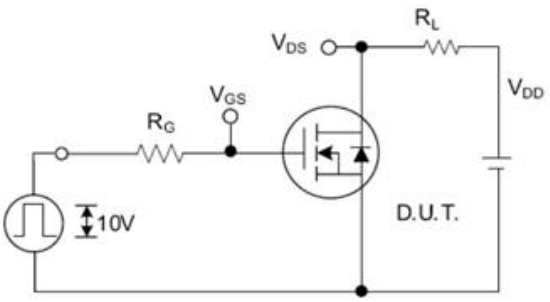


Fig. 2.1 Switching Test Circuit

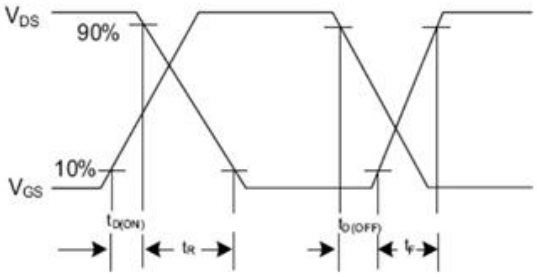


Fig. 2.2 Switching Waveforms

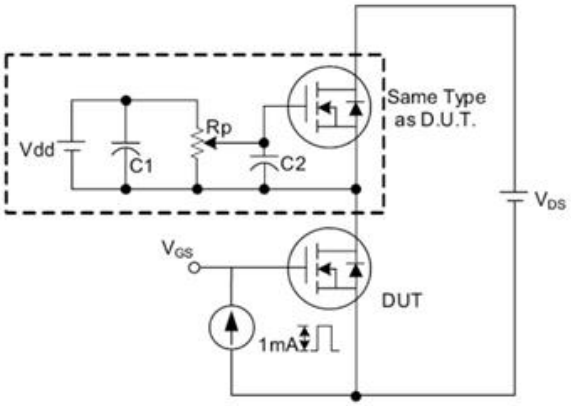


Fig. 3 . 1 Gate Charge Test Circuit

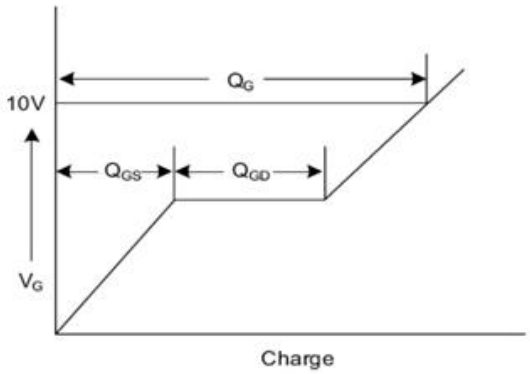


Fig. 3 . 2 Gate Charge Waveform

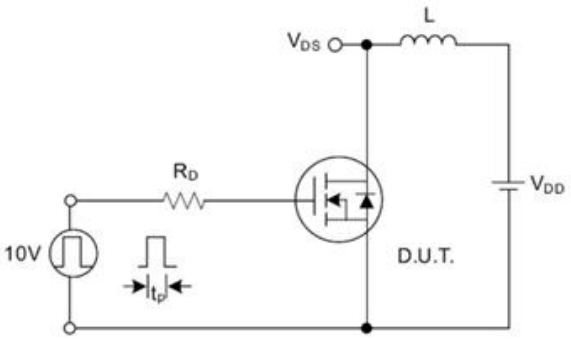


Fig. 4.1 Unclamped Inductive Switching Test Circuit

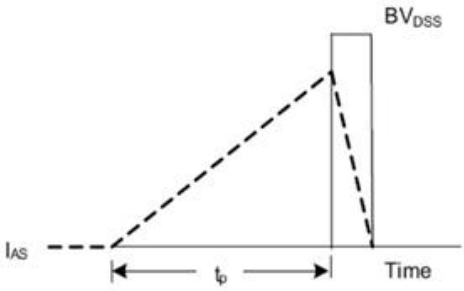


Fig. 4.2 Unclamped Inductive Switching Waveforms