

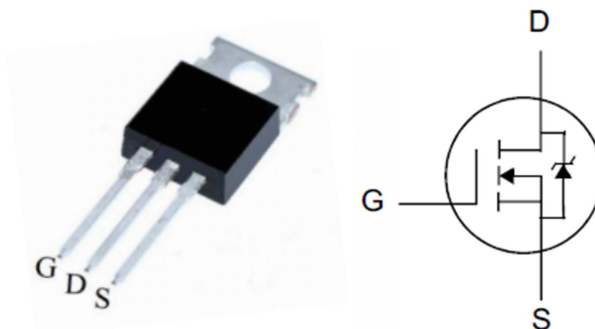
Features

- ◆ $R_{DS(on)}$ 5.4Ω@ $V_{GS}=10V$
- ◆ Fast Recovery Body Diode
- ◆ RoHS Compliant
- ◆ Lead-Free
- ◆ Halogen Free

V_{DS}	1500V
$I_D@T_C=25^{\circ}C$	3A
$R_{DS(on)}@V_{GS}=10V, I_D=2A$ Typ. ~ Max.($T_C=25^{\circ}C$)	5.4 ~ 8.2Ω

特征

- ◆ 导通电阻 5.4Ω@ $V_{GS}=10V$
- ◆ 快恢复体二极管
- ◆ 符合 RoHS 标准
- ◆ 不含铅
- ◆ 不含卤素



TO-220C

Application 应用

- ◆ Adaptor 适配器
- ◆ Charger 充电器
- ◆ SMPS Standby Power
开关电源的备用电源

MARKING CONTENT 丝印内容

Device Type 器件型号	Device Marking 器件印字
STP4N150-CN	P5K4RN150H

Ordering Information 订购信息

Device Type 器件型号	Package 封装	SPQ 标准包装量	MPQ 最小包装数量	MOQ 最小订购数量
STP4N150-CN	TO-220C	50/Tube 管装	1000/Box 盒	5000/Carton 箱

1、Package 封装

Table 1__Characteristic values

表 1__特征数值

Parameter 参数	Symbol 符号	Note or test condition 注释或测试条件	Values 数值			Unit 单位
			Min. 最小	Typ. 典型	Max. 最大	
Storage temperature 储存温度	T _{stg}	/	-55	/	+150	°C
Thermal resistance, junction-case 结点与封装外壳的热阻	R _{th(j-c)}	/	/	/	1.06	°C/W

2、MOSFET

Table 2__Maximum Ratings (T_c= 25°C unless otherwise noted)

表 2__极限参数(如无另外标识, 封装表面温度=25°C)

Parameter 参数	Symbol 符号	Note or test condition 注释或测试条件	Value 数值	Unit 单位
Drain-Source Voltage 漏极-源极电压	V _{DS}	/	1500	V
Gate-Source Voltage 栅极-源极电压	V _{GS}	/	±30	V
Continuous Drain Current 持续漏极电流	I _D	/	3.0	A
Peak Drain Current 峰值漏极电流	I _{DM}	V _{GS} =10V	12	A
Power Dissipation 耗散功率	P _D	/	115	W
Single Pulse Avalanche Energy 单脉冲雪崩能量	E _{AS}	L=30mH	500	mJ

Table 3 _ Electrical Characteristic Values($T_J=25^{\circ}\text{C}$, unless otherwise noted)
表 3 _ 电气特性数值(如无另外标识, 工作温度=25°C)

Parameter 参数	Symbol 符号	Note or test condition 注释或测试条件	Limits 限值			Unit 单位
			Min.	Typ.	Max.	
Drain-source breakdown voltage 漏源极击穿电压	$V_{(BR)DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	1500	/	/	V
Zero Gate Voltage Drain Current 零栅压漏极-源极漏电流	I_{DSS}	$V_{DS}=1500V$ $V_{GS}=0V$	/	/	1	μA
		$V_{DS}=1200V$ $V_{GS}=0V$ $T_J=125^{\circ}\text{C}$	/	/	500	
Gate-Source Leakage Current 栅极驱动漏电流	I_{GSS}	$V_{GS}=+30V$ $V_{DS}=0V$	/	/	+100	nA
		$V_{GS}=-30V$ $V_{DS}=0V$	/	/	-100	
Gate threshold voltage 开启电压 (阈值电压)	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.5	/	4.5	V
Drain-Source on-state resistance 导通电阻	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2A$	/	5.4	8.2	Ω
Internal Gate Resistance 栅级输入电阻	$R_{G(int)}$	$f=1\text{MHz}$	/		/	Ω
Input Capacitance 输入电容	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1\text{MHz}$	/	1600	/	pF
Output Capacitance 输出电容	C_{oss}		/	100	/	
Reverse Transfer Capacitance 反向传输电容	C_{rss}		/	33	/	
Forward Transconductance 正向跨导	g_{fs}	$V_{DS}=15V$ $I_D=3A$	/	3.0	/	S

Table 4 __ Characteristic Values
表 4 __ 特征数值

Parameter 参数	Symbol 符号	Note or test condition 注释或测试条件	Limits 限值			Unit 单位
			Min.	Typ.	Max.	
Gate input resistance 栅极输入电阻	R _g	f=1MHz Gate DC Bias=0 Test signal level=20mV open drain	/	4.5	/	Ω
Total Gate Charge 栅极总充电电量	Q _g	V _{DD} =750V I _D =3A V _{GS} =0 to 10V	/	36	/	nC
Gate-Source Charge 栅源极总充电电量	Q _{gs}		/	9.5	/	
Gate-Drain Charge 栅漏极总充电电量	Q _{gd}		/	12	/	
Turn-on delay time 漏源极导通延迟时间	t _{d(on)}	V _{DD} =750V I _D =3A V _{GS} =10V R _g =4.7Ω	/	25	/	ns
Rise Time 漏源极电流上升时间	t _r		/	48	/	
Turn-off delay time 漏源极关断延迟时间	T _{d(off)}		/	57	/	
Fall time 漏源极电流下降时间	t _f		/	52	/	
Operating junction temperature 工作结温度	T _{vj}		-55	/	+150	°C

3、Source-Drain Diode characteristics 源极-漏极二极管特性

Table 5__Maximum rated values (TA= 25°C unless otherwise noted)

表 5__最大额定值(如无另外标识, 环境温度=25°C)

Parameter 参数	Symbol 符号	Note or test condition 注释或测试条件	Value 数值		Unit 单位
			Typ.	Max.	
Diode forward voltage 二极管正向导通电压	V _{SD}	V _{GS} =0V I _{SD} =1A	/	1.2	V
Continuous Source Current① 连续源电流	I _{SD}	Integral PN-diode in MOSFET	/	3	A
Pulsed Source Current① 脉冲源电流	I _{SM}		/	12	
Reverse Recovery Time 反向恢复时间	t _{rr}	V _{GS} =0V I _F =3A di/dt=100A/μs	255	/	ns
Reverse Recovery Charge 反向恢复电荷	Q _{rr}		1.1	/	uC

NOTE:

① Pulse width ≤380μs, duty cycle≤2%.

脉冲宽度≤380μs, 占空比≤2%。

4、Characteristics diagrams 特性图

Figure 1. Maximum Transient Thermal Impedance

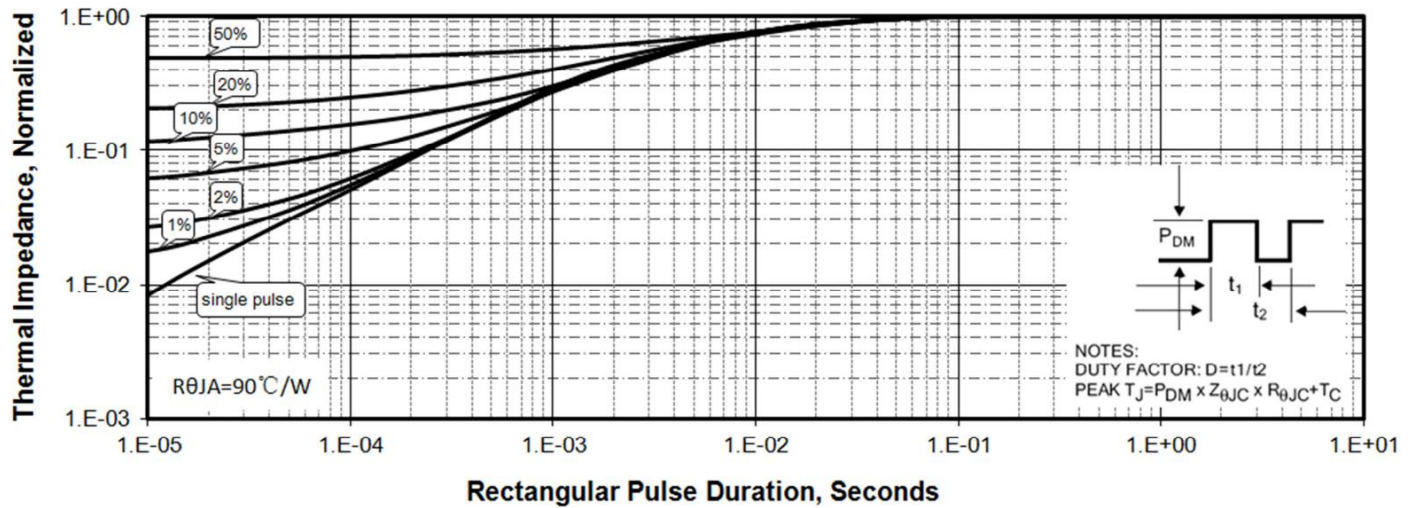


Figure 2 . Max. Power Dissipation vs Case Temperature

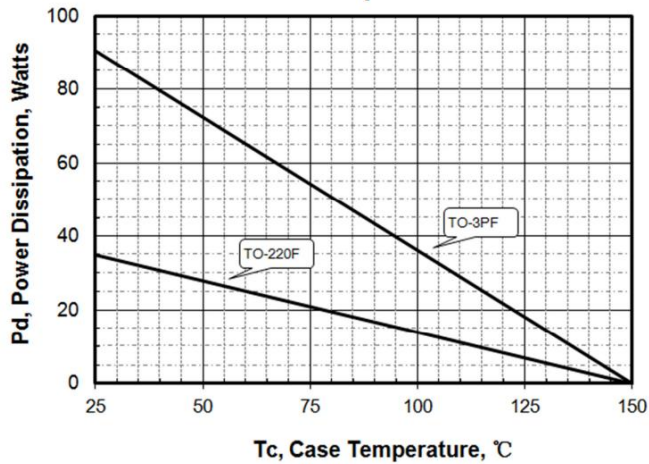


Figure 3 .Maximum Continuous Drain Current vs T_c

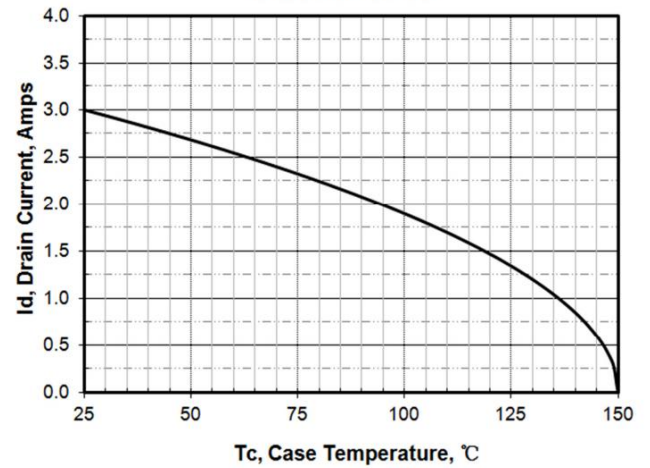


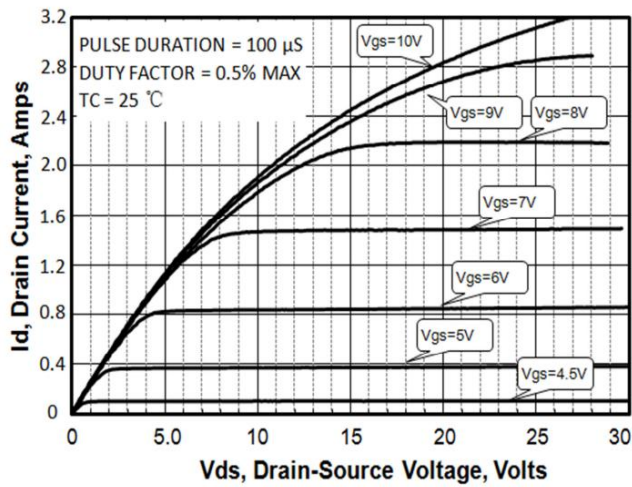
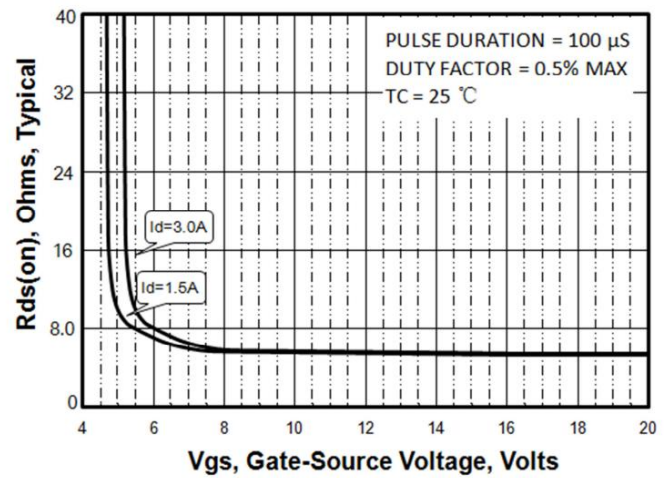
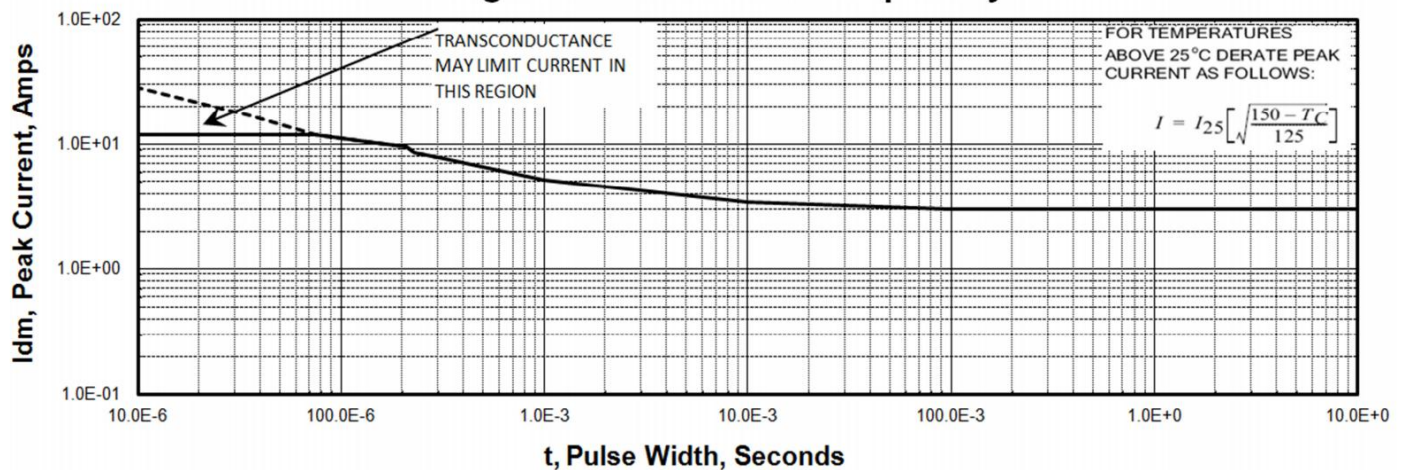
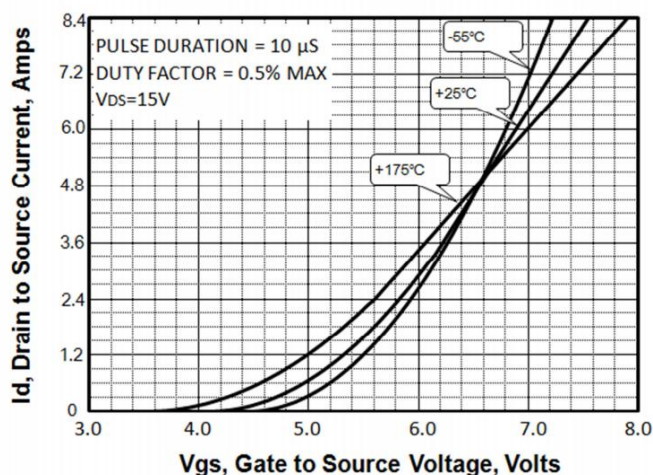
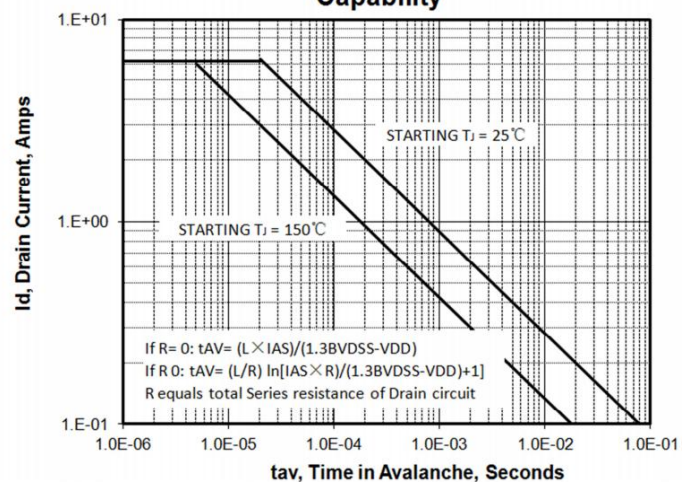
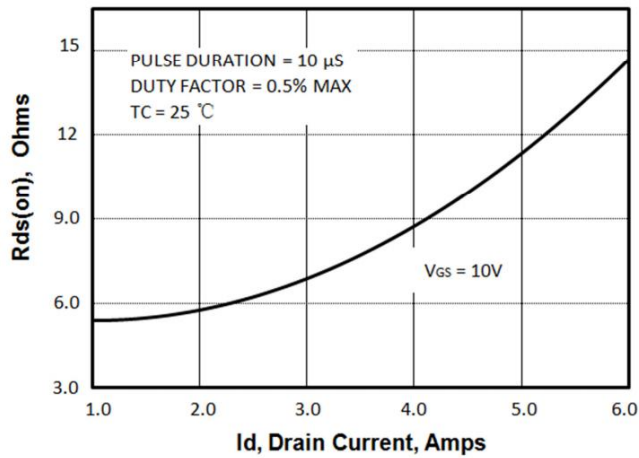
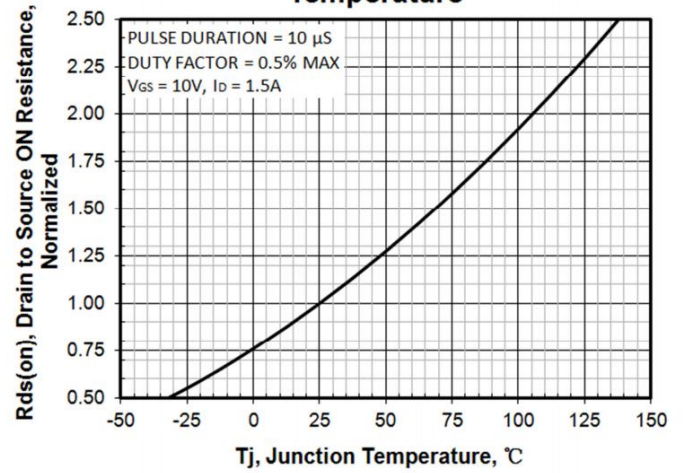
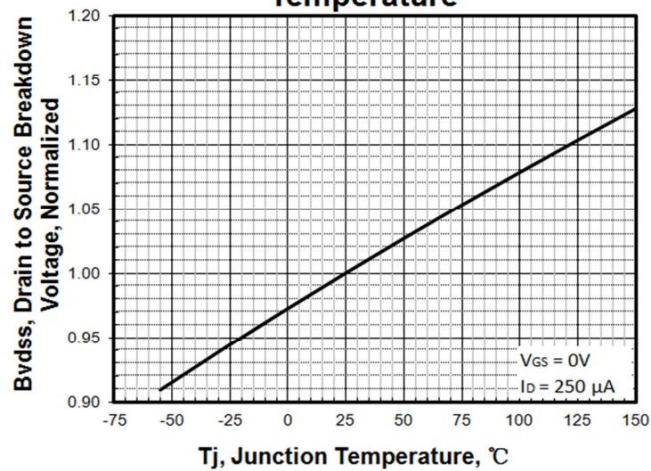
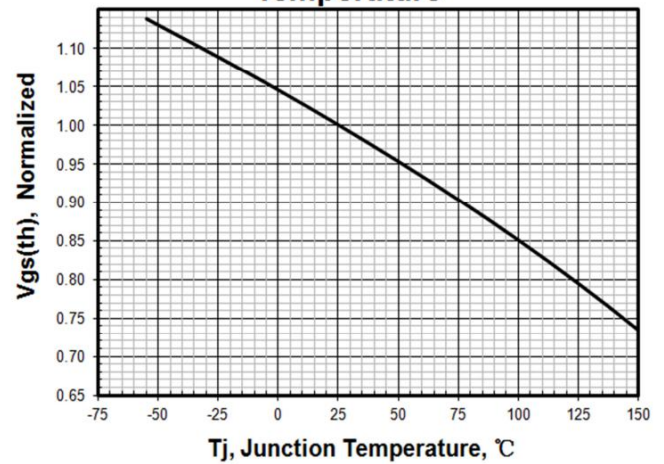
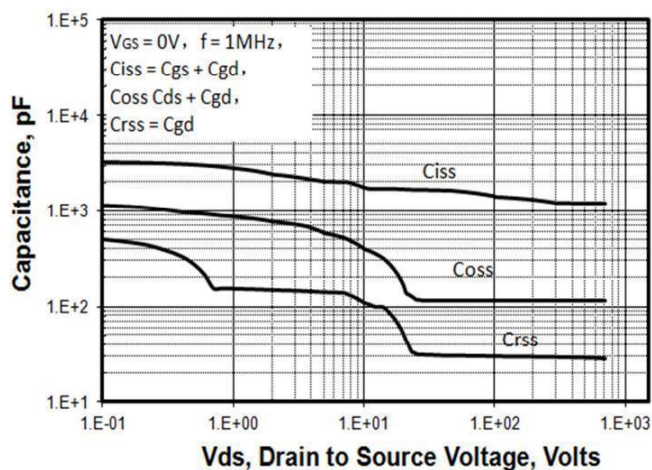
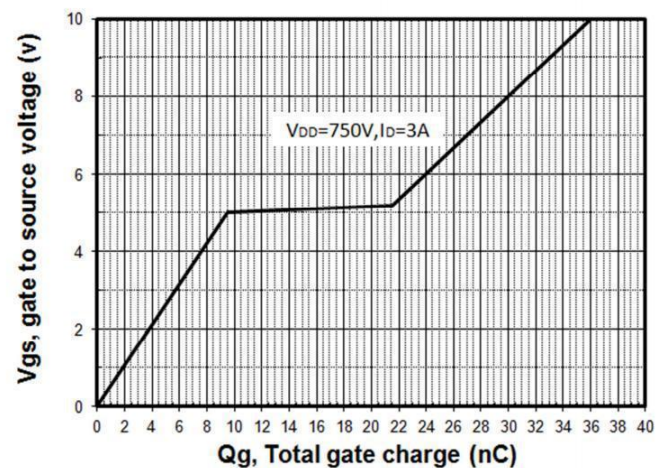
Figure 4. Output Characteristics

Figure 5. $R_{ds(on)}$ vs Gate Voltage

Figure 6. Peak Current Capability

Figure 7. Transfer Characteristics

Figure 8. Unclamped Inductive Switching Capability


Figure 9. Drain to Source ON Resistance vs Drain Current

Figure 10. Rdson vs Junction Temperature

Figure 11. Breakdown Voltage vs Temperature

Figure 12. Threshold Voltage vs Temperature

Figure 13. Capacitance vs Vds

Figure 14. Typical Gate Charge


Test circuits and waveforms

测试电路和波形

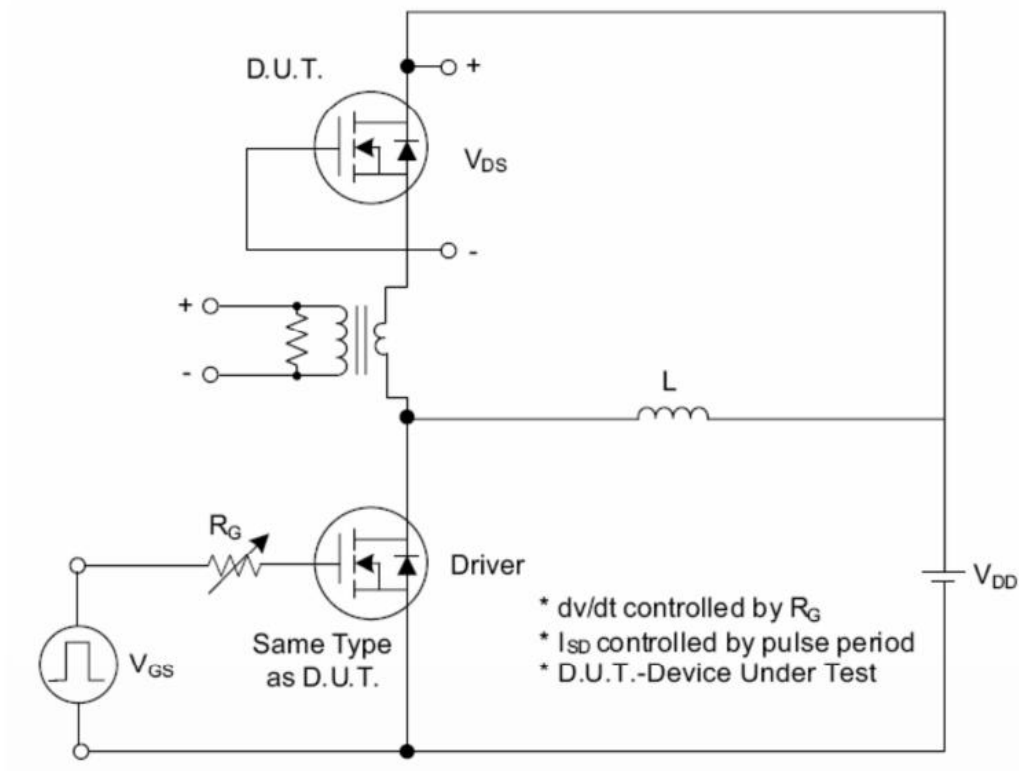


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

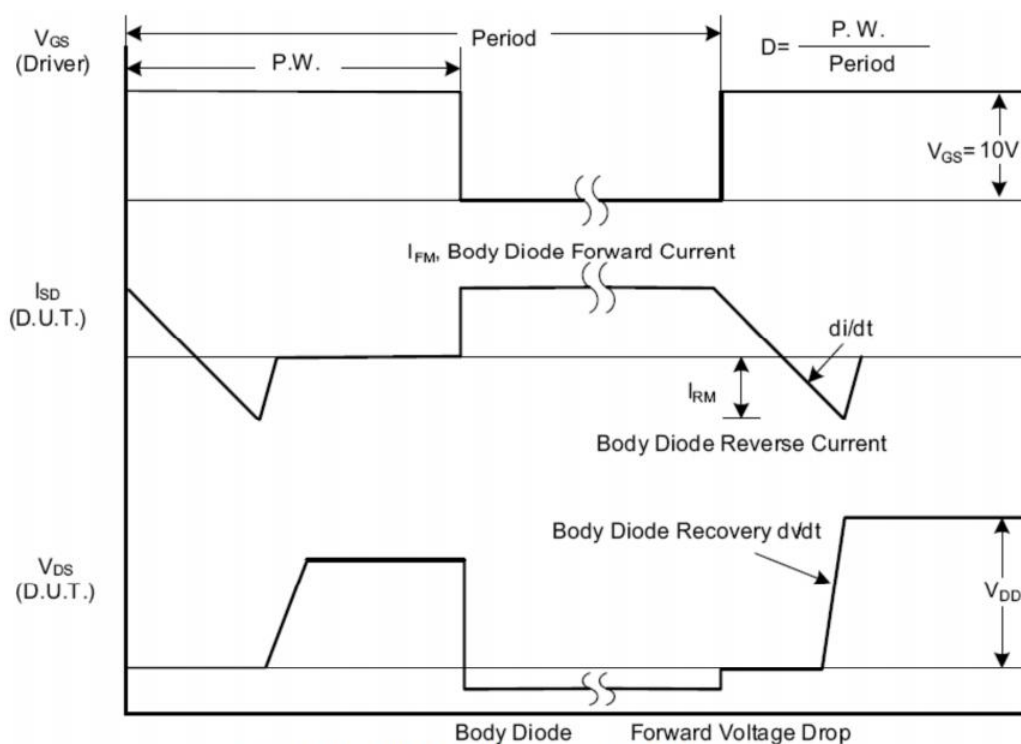


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

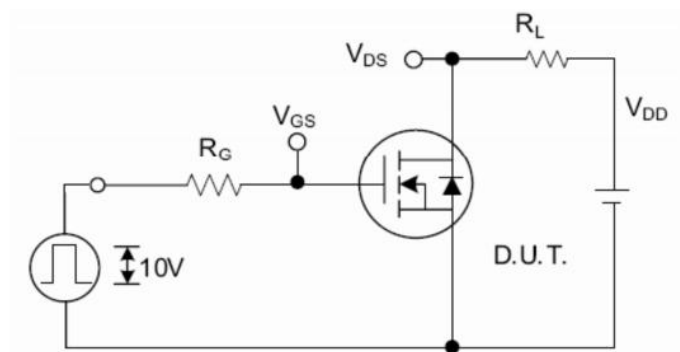


Fig. 2.1 Switching Test Circuit

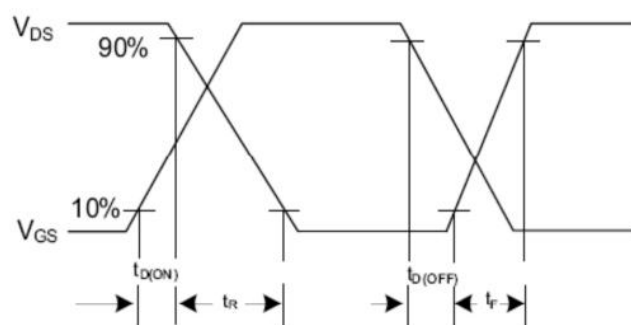


Fig. 2.2 Switching Waveforms

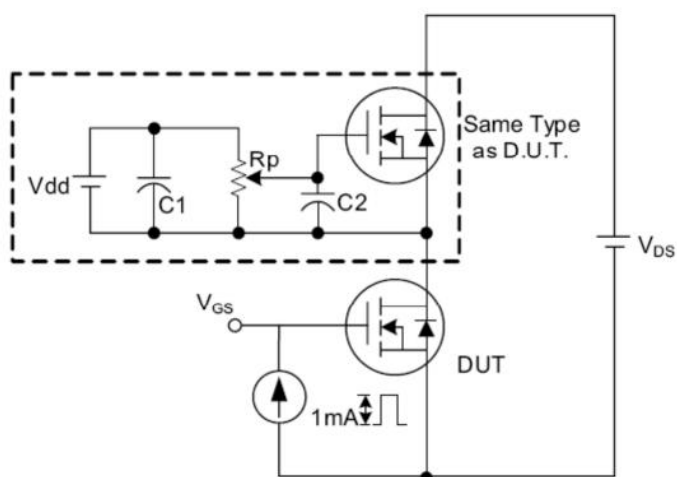


Fig. 3.1 Gate Charge Test Circuit

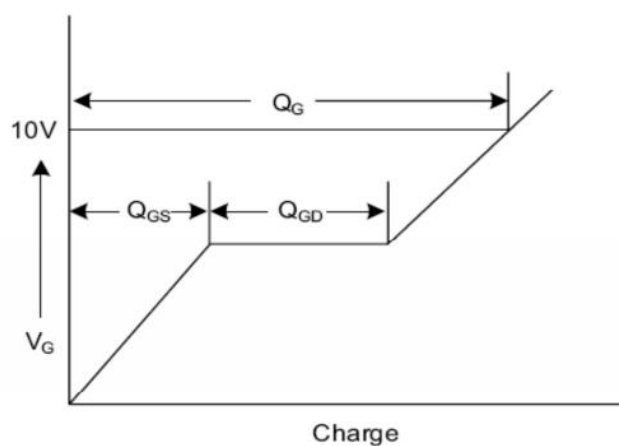


Fig. 3.2 Gate Charge Waveform

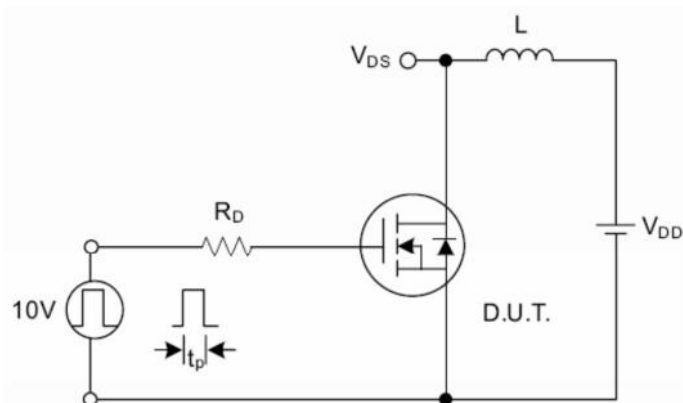


Fig. 4.1 Unclamped Inductive Switching Test Circuit

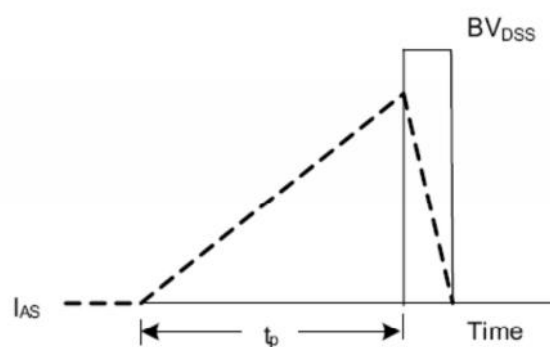


Fig. 4.2 Unclamped Inductive Switching Waveforms

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