FCW120N80M1

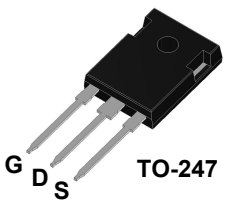
N沟道 *e*SiC 碳化硅Mosfet

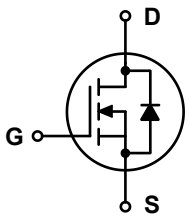
1200 V, 30 A, 80 mΩ

特点

- 高开关速度，低栅极电荷
- 具有低反向恢复的快速体二极管
- 强大的雪崩能力
- 100% 雪崩测试
- 无铅、无卤且符合RoHS标准

$BV_{DSS,\ Tc=25℃}$	$I_{D,\ Tc=25℃}$	$R_{DS(on),typ}$	$Q_{g,typ}$
1200 V	30 A	80 mΩ	50 nC





优势

- 提供效率提升
- 更高频率的适用性
- 增强功率密度
- 减少冷却工作量

应用

- 光伏逆变器
- 新能源汽车充电桩
- UPS
- 工业电源

绝对最大额定值 (T_C = 25℃， 除非另有说明)

符号	参数		值	单位
V_{DSS}	Drain to Source Voltage		1200	V
V_{GS}	Gate to Source Voltage (DC)		-10 / +22	V
V_{GSop}	Recommended Operation Value		-5 / +18	V
I_D	Drain Current	Continuous (T_C = 25℃)	30	A
		Continuous (T_C = 100℃)	21	
I_{DM}	Drain Current	Pulsed (Note1)	80	A
P_D	Power Dissipation	(T_C = 25℃)	150	W
		Derate Above 25℃	1.00	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 175	℃
T_L	Maximum Lead Temperature for Soldering, 1/8” from Case for 10 Seconds		260	℃

※注 1 : 受最高结温限制

热特性

符号	参数	值	单位
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.00	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	40	

封装标识和订购信息

零件编号	顶部标识	封装	包装方式	数量
FCW120N80M1	FCW120N80M1	TO-247	Tube	30 units

电特性 (T_C = 25℃ 除非另有说明)

符号	参数	测试条件	最小值	典型值	最大值	单位
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D = 1 mA	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 1200 V, V_{GS} = 0 V		1	100	μA
		V_{DS} = 1200 V, V_{GS} = 0 V, T_J = 175℃		5		
I_{GSS}	Gate-Source Leakage Current	V_{GS} = +22 V, V_{DS} = 0 V			+100	nA
		V_{GS} = -10 V, V_{DS} = 0 V			-100	
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 5.0 mA (tested after V_{GS} = 22 V, 1 ms pulse)	2.0	3.0	4.5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 18 V, I_D = 15 A		80	110	mΩ
		V_{GS} = 18 V, I_D = 15 A, T_J = 175℃		128		
g_{fs}	Transconductance	V_{DS} = 20 V, I_D = 15 A		11.4		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 800 V, V_{GS} = 0V, f = 250 kHz		880		pF
C_{oss}	Output Capacitance			64		
C_{rss}	Reverse Capacitance			5		
E_{oss}	Stored Energy in Output Capacitance	V_{DS} = 0 V to 800 V, V_{GS} = 0 V		26		μJ
$C_{o(er)}$	Energy Related Output Capacitance			80		pF
$C_{o(tr)}$	Time Related Output Capacitance			142		
$Q_{g(tot)}$	Total Gate Charge	V_{DS} = 800 V, I_D = 15 A, V_{GS} = -5 V / 18 V, Inductive load		50		nC
Q_{gs}	Gate to Source Charge			13		
Q_{gd}	Gate to Drain “Miller” Charge			17		
R_G	Internal Gate Resistance	f = 1 MHz		4.0		Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 800 V, I_D = 15 A, V_{GS} = -5 V / 18 V, R_G = 2 Ω, FWD : PCH120S10D1, Inductive load		14		ns
t_r	Turn-On Rise Time			21		
$t_{d(off)}$	Turn-Off Delay Time			24		
t_f	Turn-Off Fall Time			9		
E_{on}	Turn-on Switching Energy			183		μJ
E_{off}	Turn-off Switching Energy			42		
E_{tot}	Total Switching Energy			225		
Source-Drain Diode Characteristics						
I_S	Maximum Continuous Diode Forward Current				30	A
I_{SM}	Maximum Pulsed Diode Forward Current				80	
V_{SD}	Diode Forward Voltage	V_{GS} = -5 V, I_{SD} = 15 A		4.1		V
t_{rr}	Reverse Recovery Time	V_{DD} = 800 V, I_{SD} = 15 A, dI_F/dt = 1000 A/μs, Includes Q_{oss}		34		ns
Q_{rr}	Reverse Recovery Charge			112		nC

典型性能特性

Figure 1. 输出曲线 T_J = -40℃

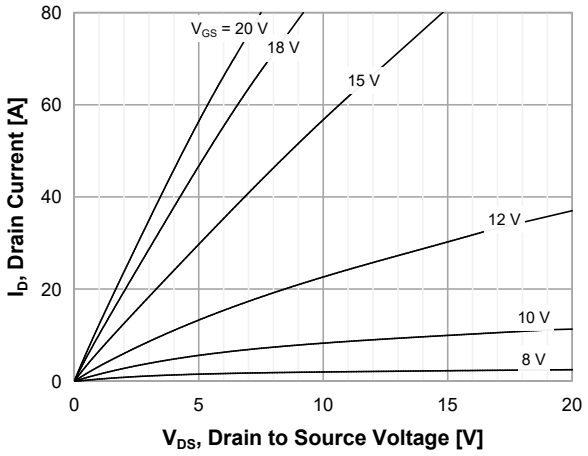


Figure 2. 输出曲线 T_J = 25℃

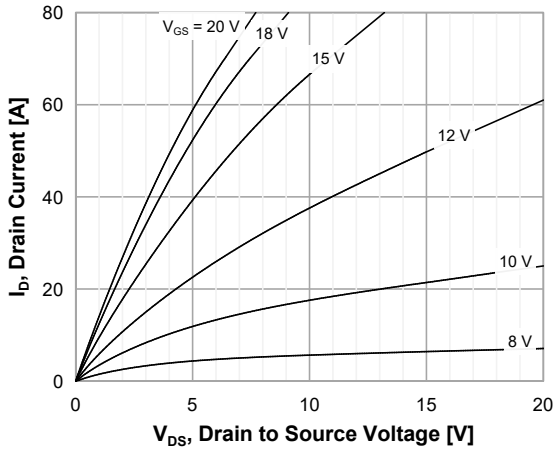


Figure 3. 输出曲线 T_J = 175℃

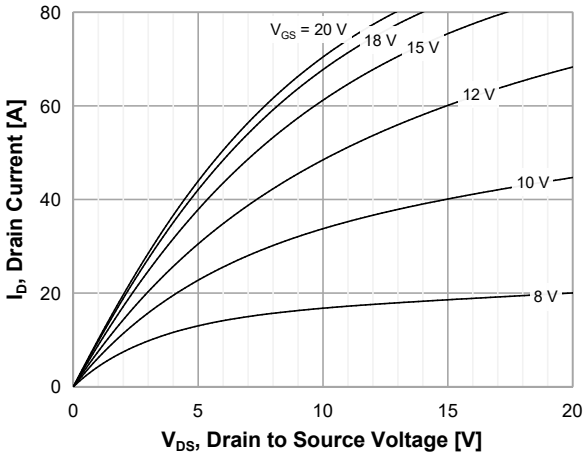


Figure 4.规范化导通电阻特性与温度的关系

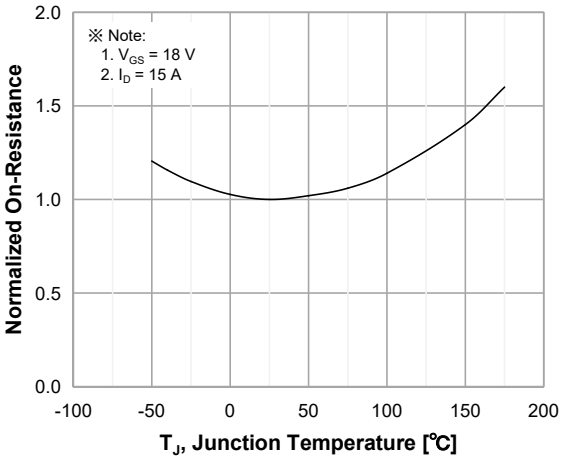


Figure 5. 传输特性曲线

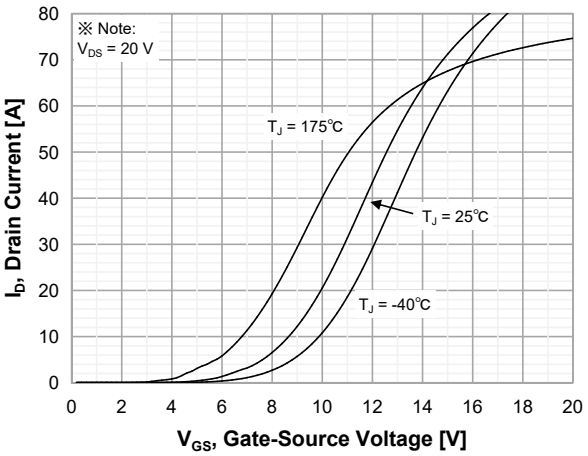
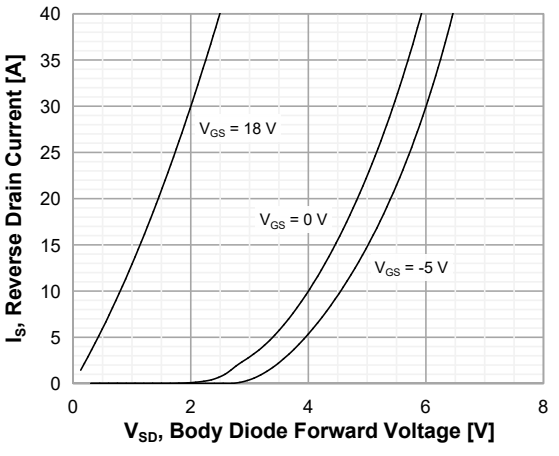


Figure 6.二极管正向电压与源级漏电流曲线 T_J = -40℃



典型性能特性

Figure 7.二极管正向电压与源级漏电流曲线 T_J = 25℃

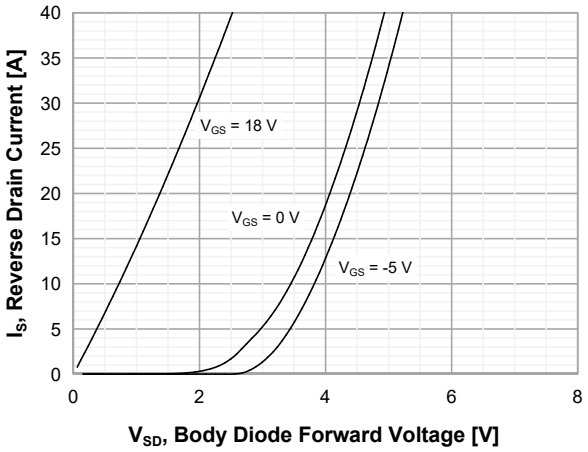


Figure 8.二极管正向电压与源级漏电流曲线 T_J = 175℃

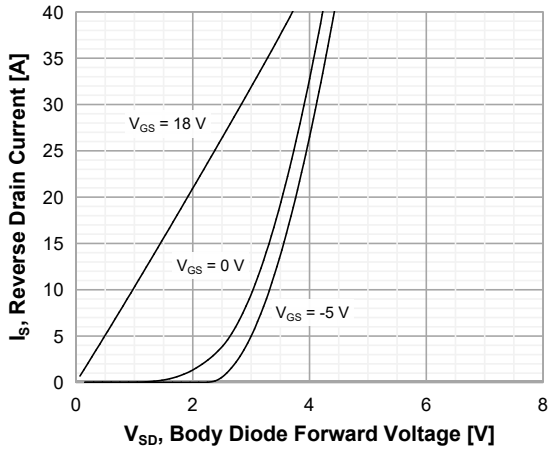


Figure 9. 阈值电压与温度关系

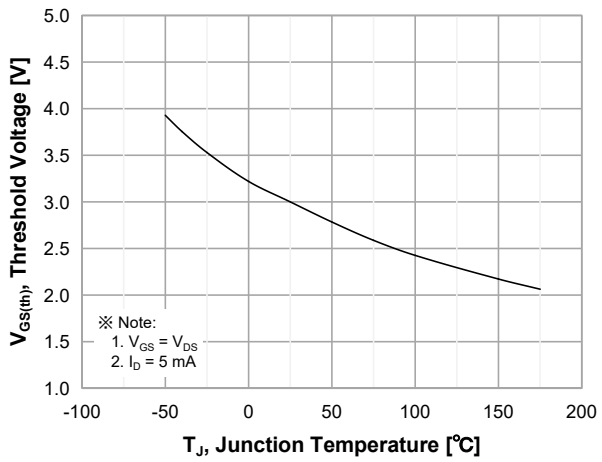


Figure 10. 栅极电荷特性

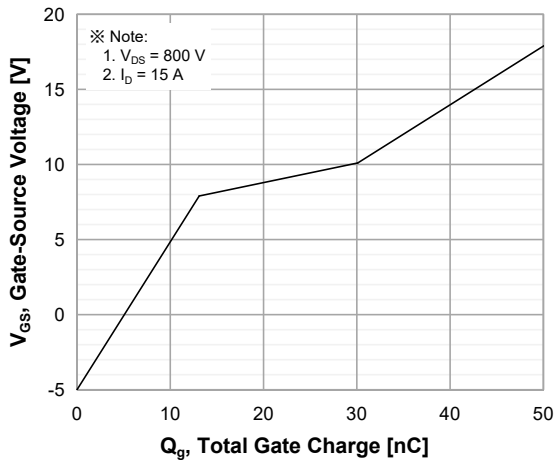


Figure 11.输出电容中的储存能量

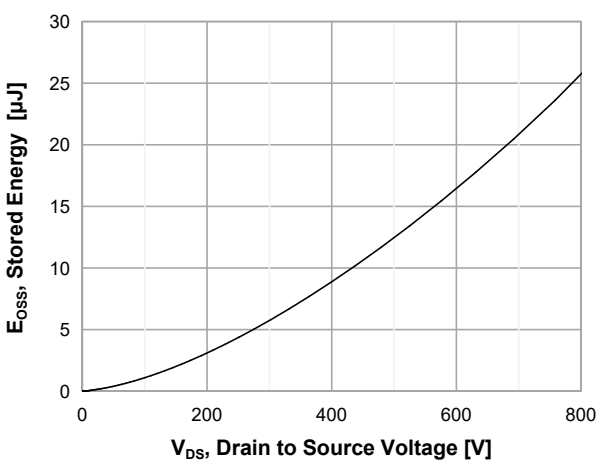
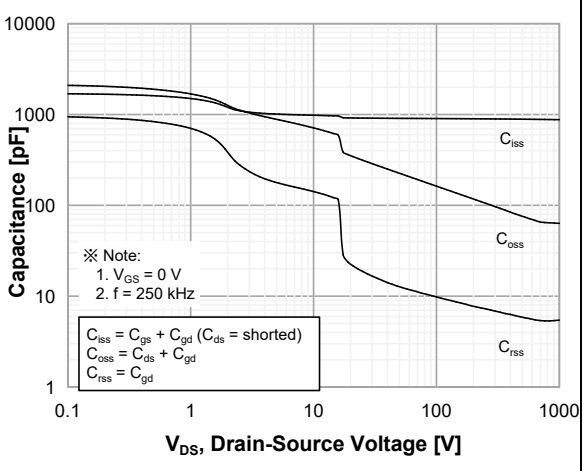


Figure 12. 电容特性



典型性能特性

Figure 13.连续漏极电流降额与外壳温度

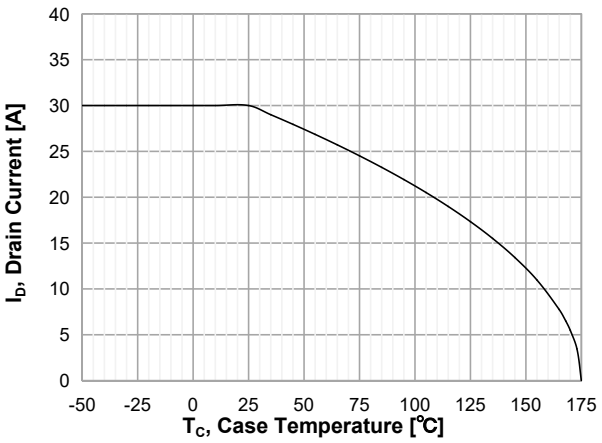


Figure 14.最大功耗降额与外壳温度

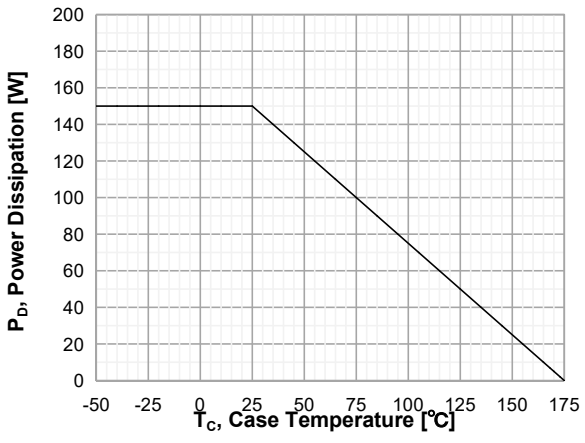


Figure 15. Typ.开关损耗与漏极电流

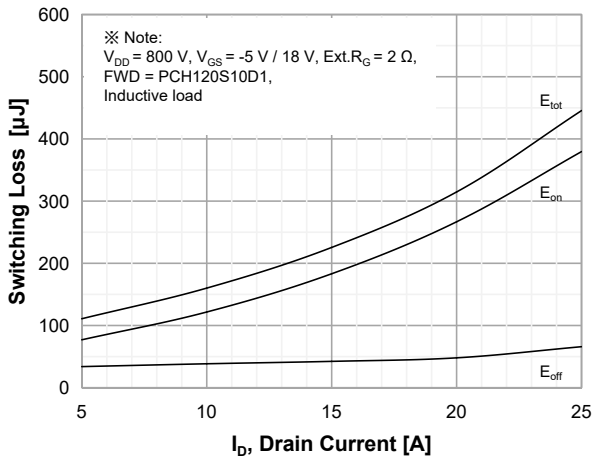


Figure 16. Typ.开关损耗与栅极电阻

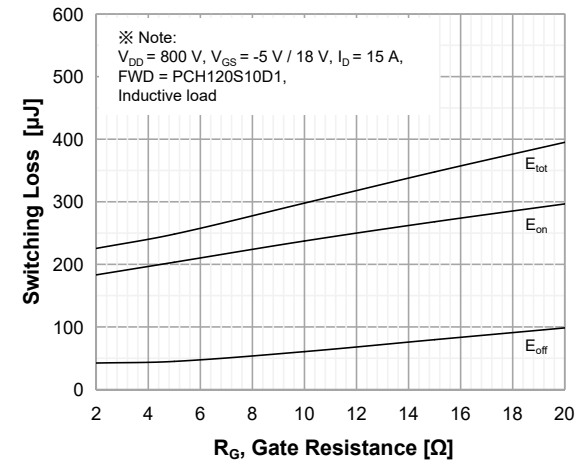


Figure 17. Typ.开关损耗与漏极电流

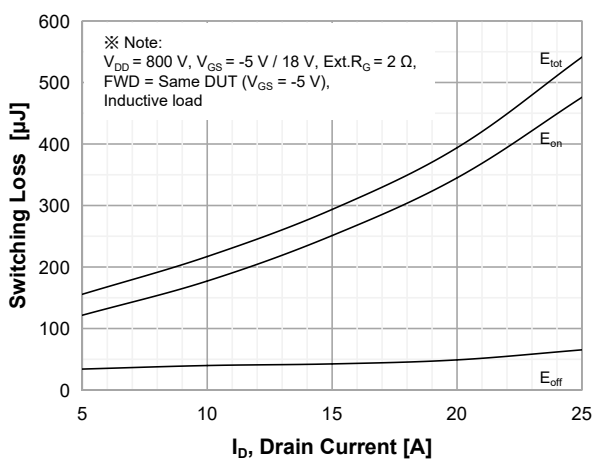
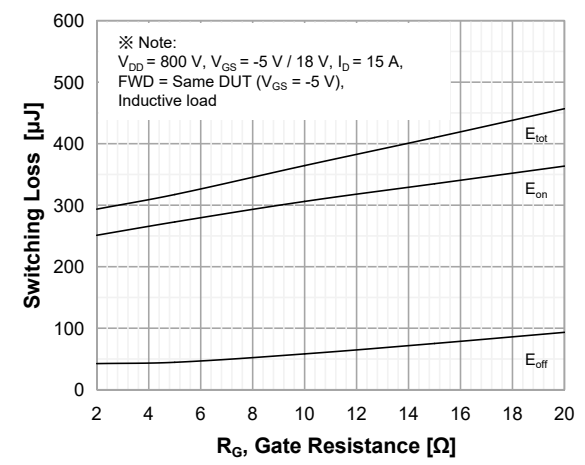


Figure 18. Typ.开关损耗与栅极电阻



典型性能特性

Figure 19.最大安全操作区域

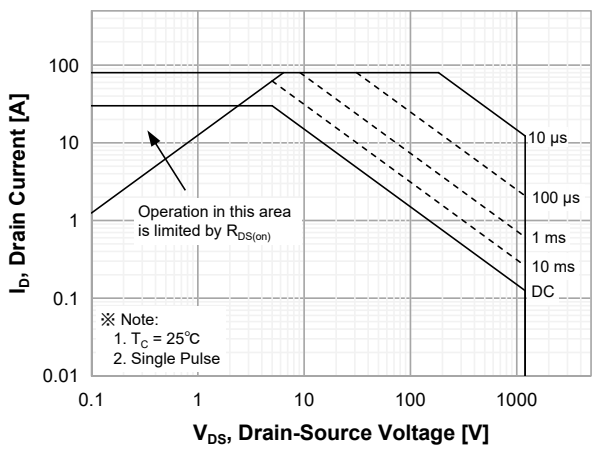


Figure 20.瞬态热响应曲线

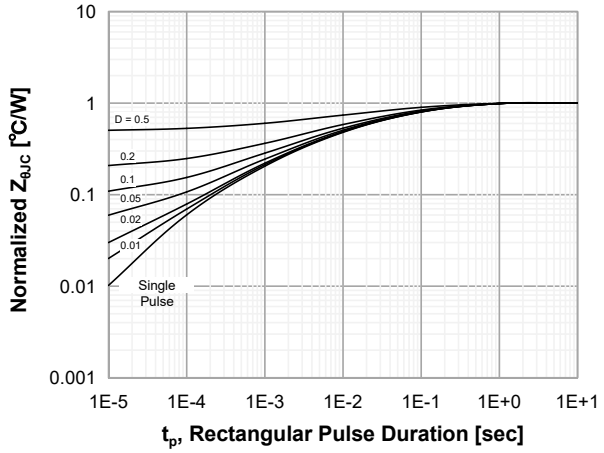


Figure 21.电感负载切换测试电路和波形

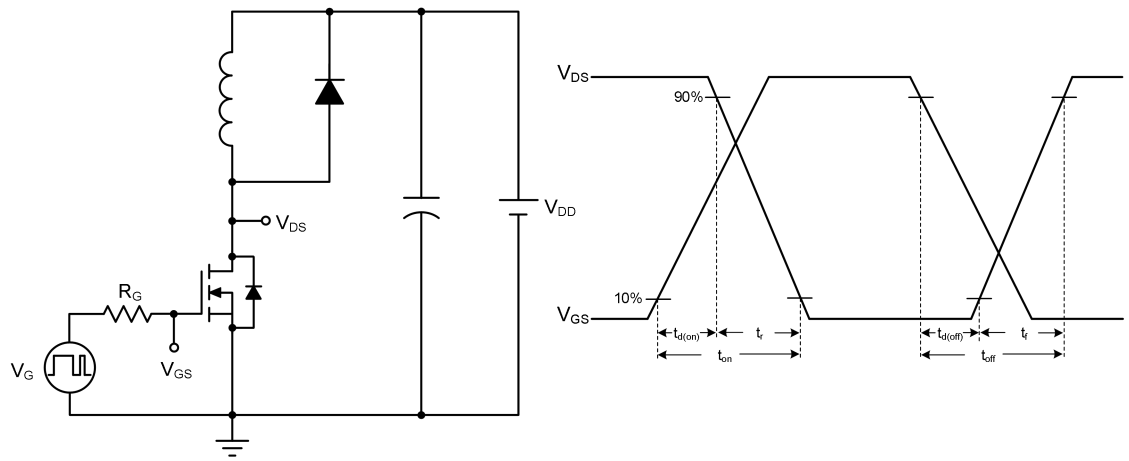
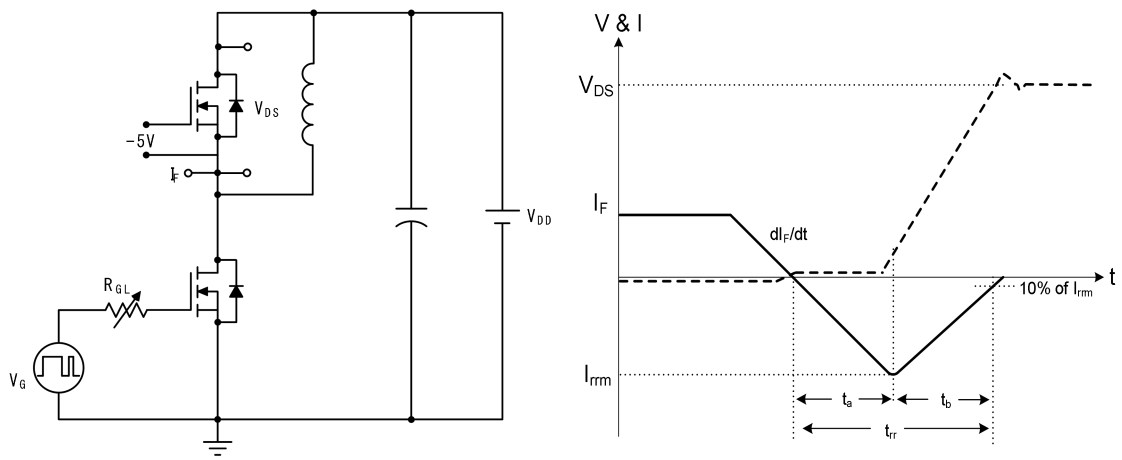
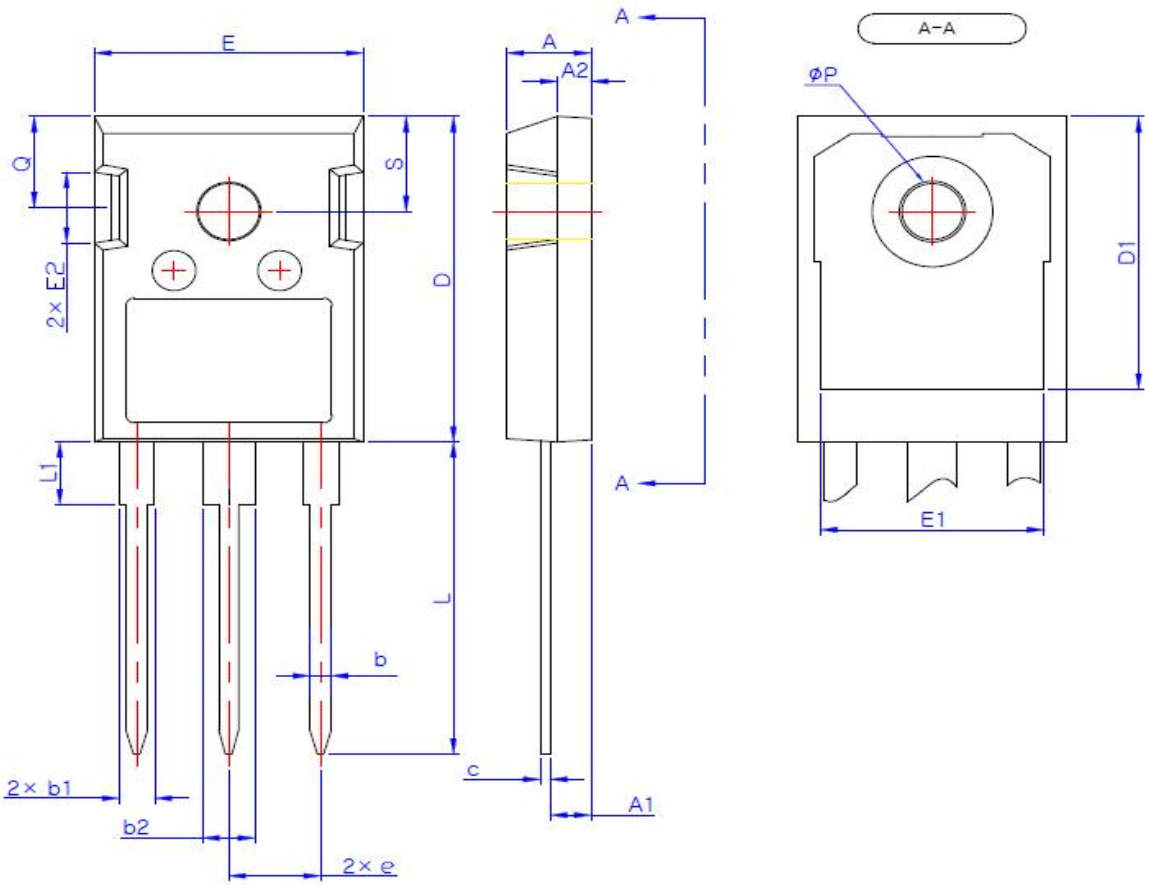


Figure 22.峰值二极管恢复dv/dt测试电路和波形



封装外形图

TO-247 (S)

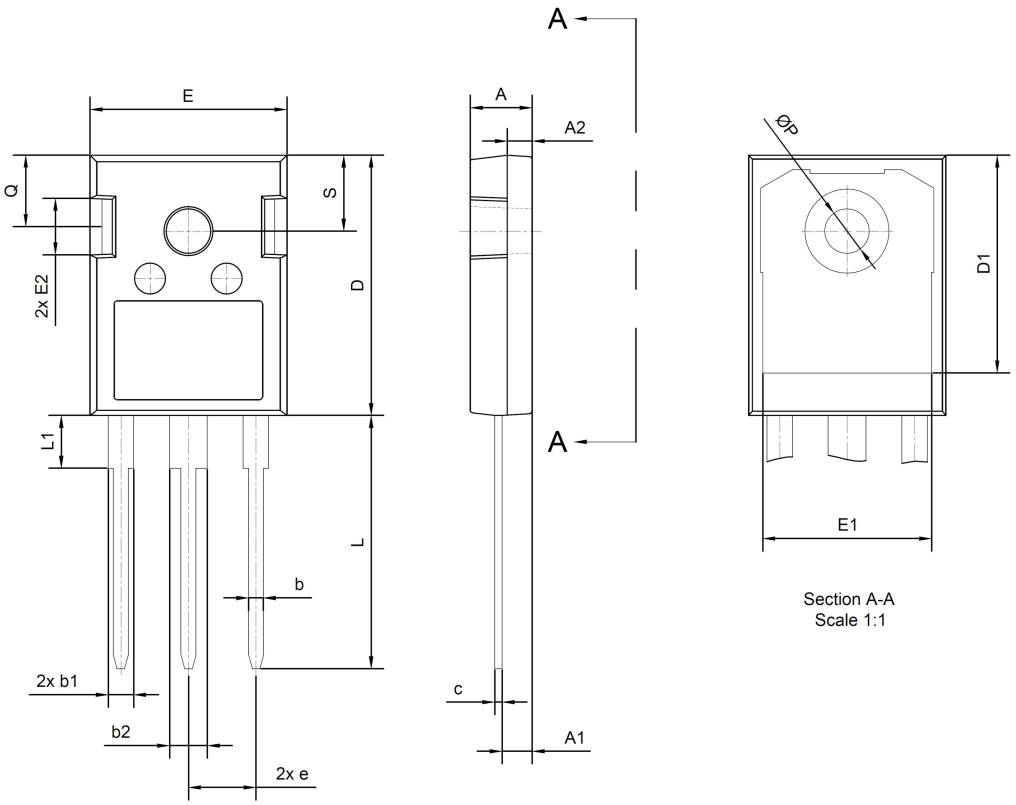


SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.29	2.42	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.06	2.20
b2	2.92	3.06	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.43	17.63	17.83
E	15.75	15.94	16.13
E1	13.06	13.26	13.46
E2	4.32	4.58	4.83
e	5.45 BSC		
L	19.85	20.05	20.25
L1	4.05	4.27	4.49
ΦP	3.55	3.60	3.65
Q	5.59	5.89	6.19
S	6.15 BSC		

* Dimensions in millimeters

封装外形图

TO-247 (H)



SYMBOL	Common		
	DIMENSIONS MILLIMETER		
	MIN.	NOM.	MAX.
A	4.80	5.00	5.20
A1	2.29	2.42	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.06	2.20
b2	2.92	3.06	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.23	17.63	18.03
E	15.75	15.94	16.13
E1	13.46	13.66	13.86
E2	4.32	4.58	4.83
e	5.46 BSC		
L	19.85	20.05	20.25
L1	4.05	4.27	4.48
ØP	3.56	3.61	3.66
Q	5.38	5.79	6.20
S	6.15 BSC		