N 沟道增强型场效应晶体管
N-Channel MOSFET
FHP230N06V

主要参数 MAIN CHARACTERISTICS

ID(Tc=25℃, Silicon Limited)	230A
VDSS	60 V
Rdson-typ（ @Vgs=10V）	2.5 mΩ
Qg-typ	160 nC

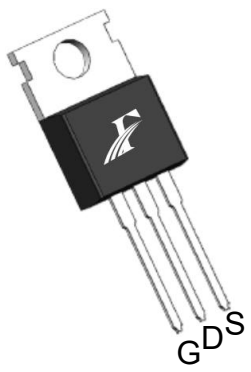
产品特性 FEATURES

低内阻	Low On-Resistance
低栅极电荷	Low gate charge
低 Crss (典型值 629pF)	Low Crss (typical 629pF)
开关速度快	Fast switching
100%经过雪崩测试	100% avalanche tested
100%经过热阻测试	100% DVDS tested
100%经过 Rg 测试	100% Rg tested
符合 RoHS 标准	RoHS compliant
飞虹特色沟槽工艺技术	FH-Trench technology

用途 APPLICATIONS

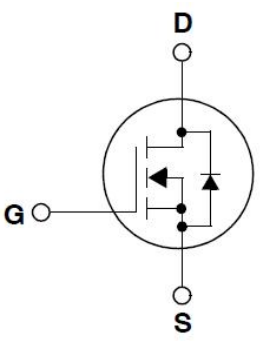
逆变器	Inverter
同步整流	Synchronous rectification
DC-DC	DC-DC
不间断电源	UPS (Uninterrupible Power Supplies)

封装形式 Package



TO-220
FHP series

示意图 Schematic diagram



绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项目 **Parameter**	符号 **Symbol**	数值 **Value** FHP230N06V	单位 **Unit**
最高漏极一源极直流电压 Drain-Source Voltage	V_{DS}	60	V
连续漏极电流* Drain Current -continuous *	I_D（Tc=25℃），Silicon Limited	230	A
	I_D（Tc=25℃），Package Limited	163	A
	I_D（Tc=100℃），Silicon Limited	163	A
最大脉冲漏极电流（注 1） Drain Current – pulse（note 1）	I_{DM}	640	A
最高栅源电压 Gate-Source Voltage	V_{GS}	±20	V
单脉冲雪崩能量（注 2） Single Pulsed Avalanche Energy（note 2）	E_{AS}	1740	mJ
单脉冲雪崩能量测试值（注 3） Single Pulsed Avalanche Energy Tested Value（note 3）	$E_{AS(Tested)}$	435	mJ
耗散功率 Power Dissipation	P_D （TC=25℃）	313	W
	-Derate above 25℃	2.08	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T_J，T_{STG}	175，-55～+175	℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes (1.6mm from case for 10s)	T_L	260	℃

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature

电特性 ELECTRICAL CHARACTERISTICS

项目 **Parameter**	符号 **Symbol**	测试条件 **Tests conditions**	最小 **Min**	典型 **Typ**	最大 **Max**	单位 **Units**
关态特性 **Off –Characteristics**						
漏一源击穿电压 Drain-Source Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	60	70	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta TJ$	I_D=250μA, referenced to 25℃	-	0.056	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V, T_J=25℃	-	0.1	1	μA
		V_{DS}=60V, T_J=125℃	-	-	250	μA
栅极体漏电流 Gate-body leakage current	I_{GSS}（F/R）	V_{DS}=0V, V_{GS} =±20V	-	-	±100	nA
通态特性 **On-Characteristics**						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D=250μA	2	-	4	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V , I_D=80A	-	2.5	3.0	mΩ
动态特性 **Dynamic Characteristics**						
栅电阻 Gate Resistance	Rg	f=1.0MHz,V_{DS} OPEN	-	0.9	-	Ω
输入电容 Input capacitance	Ciss	V_{DS}=25V, V_{GS} =0V, f=1.0MHz	-	8656	-	pF
输出电容 Output capacitance	Coss		-	830	-	
反向传输电容 Reverse transfer capacitance	Crss		-	629	-	
开关特性 **Switching Characteristics**						
延迟时间 Turn-On delay time	td(on)	V_{DS}=30V, I_D=80A, R_G=10Ω V_{GS} =10V （note 4）	-	52	-	ns
上升时间 Turn-On rise time	tr		-	157	-	ns
延迟时间 Turn-Off delay time	td(off)		-	137	-	ns
下降时间 Turn-Off Fall time	tf		-	136	-	ns
栅极电荷总量 Total Gate Charge	Qg	V_{DS} =30V , I_D=80A , V_{GS} =10V （note 4）	-	160	-	nC
栅一源电荷 Gate-Source charge	Qgs		-	42	-	nC
栅一漏电荷 Gate-Drain charge	Qgd		-	58	-	nC
漏一源二极管特性及最大额定值 **Drain-Source Diode Characteristics and Maximum Ratings**						
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	I_S		-	-	163	A
正向最大脉冲电流（注 1） Maximum Pulsed Drain-Source Diode Forward Current （note1）	I_{SM}		-	-	640	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=80A	-	0.87	1.2	V
反向恢复时间 Reverse recovery time	trr	V_{GS}=0V, I_S=80A ,dI_F/dt=100A/μs (note 4)	-	42	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	40	-	nC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	Max	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.48	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	℃/W

注释：
1：脉冲宽度由最高结温限制
2：L=1mH, V_{DD}=50V, R_G=25 Ω,起始结温 T_J=25℃
3：该值由故障样本确定，在生产中 100%测试了该值。
4：脉冲测试：脉冲宽度 ≤300μs,占空比≤2%

Notes:
1：Pulse width limited by maximum junction temperature
2：L=1mH, V_{DD}=50V, R_G=25 Ω,Starting T_J=25℃
3：This value determined from sample failure population，100% tested to this value in production.
4：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%

典型特性曲线 Typical Performance Characteristics

Figure 1. Safe Operating Area

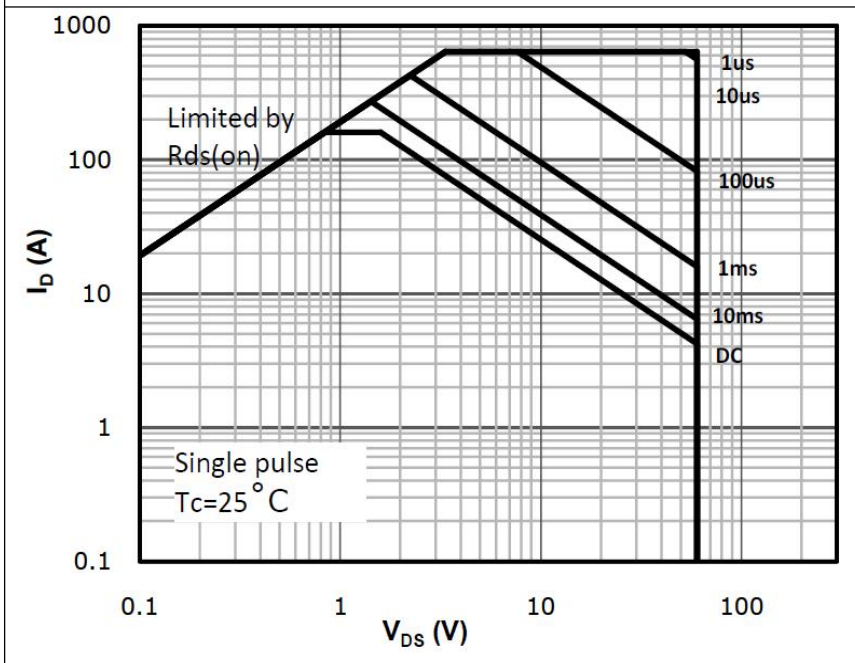


Figure 2. Maximum power Dissipation vs Case Temperature

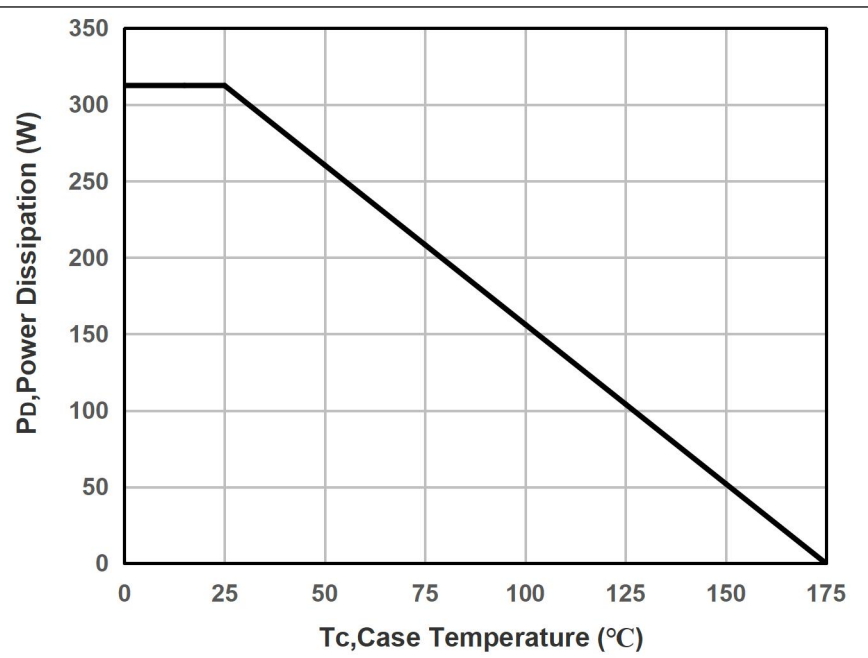


Figure 3. Maximum Continuous Drain Current vs Case Temperature

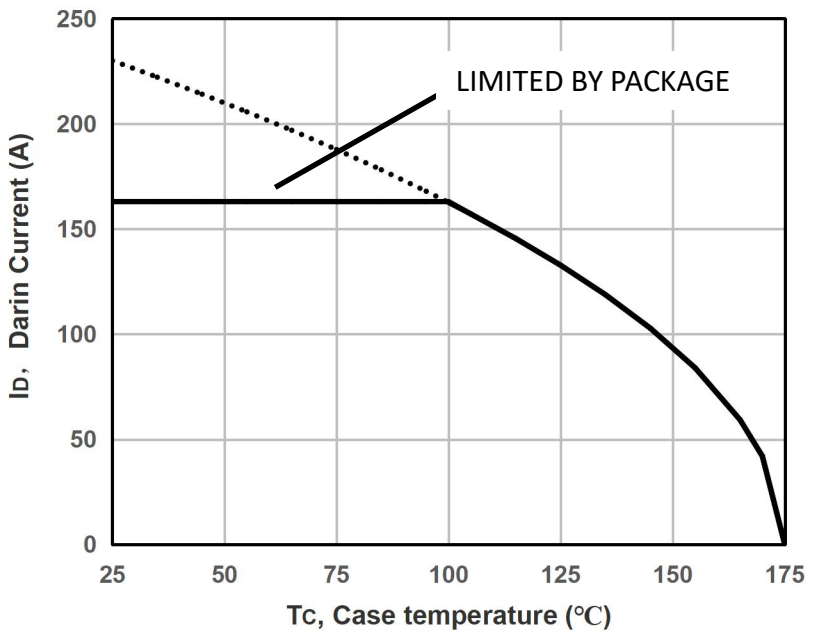


Figure 4. Typical Output Characteristics

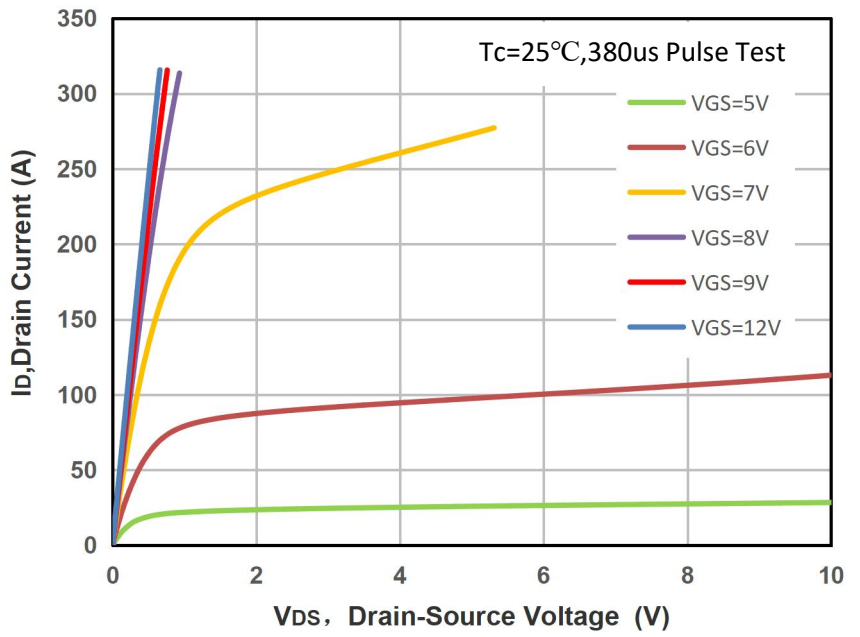


Figure 5. Typical Transfer Characteristics

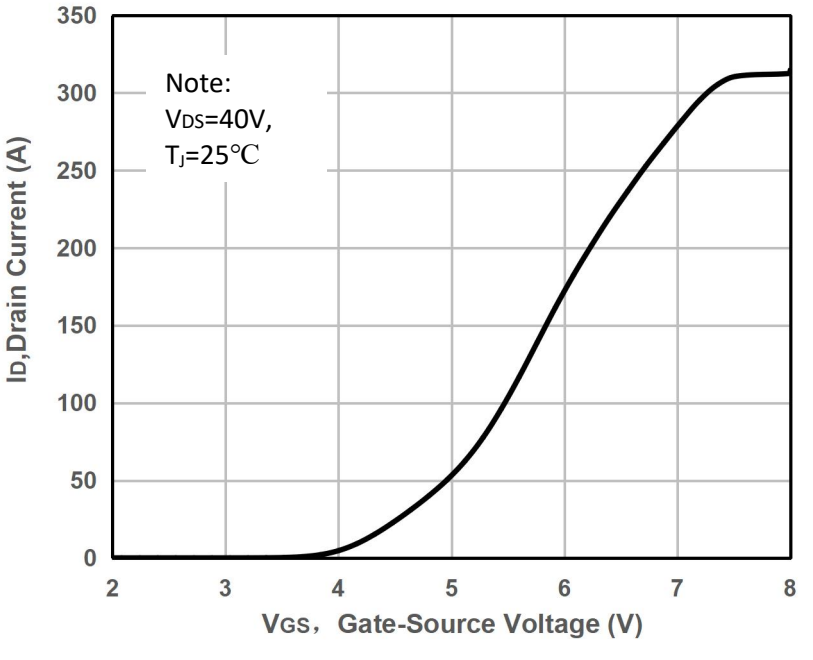


Figure 6. Source-Drain Diode Forward Characteristics

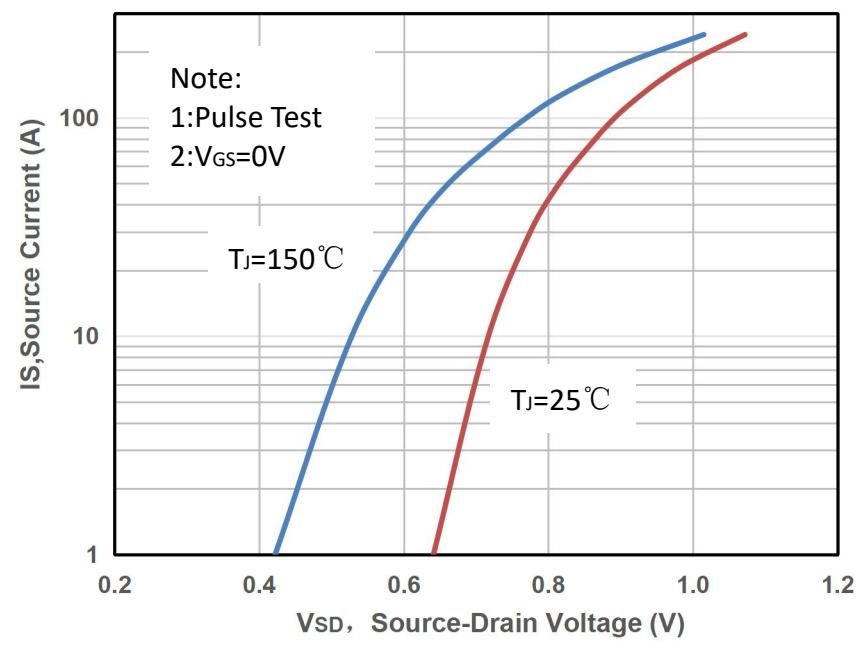


Figure 7. Drain-Source On-Resistance vs Drain Current

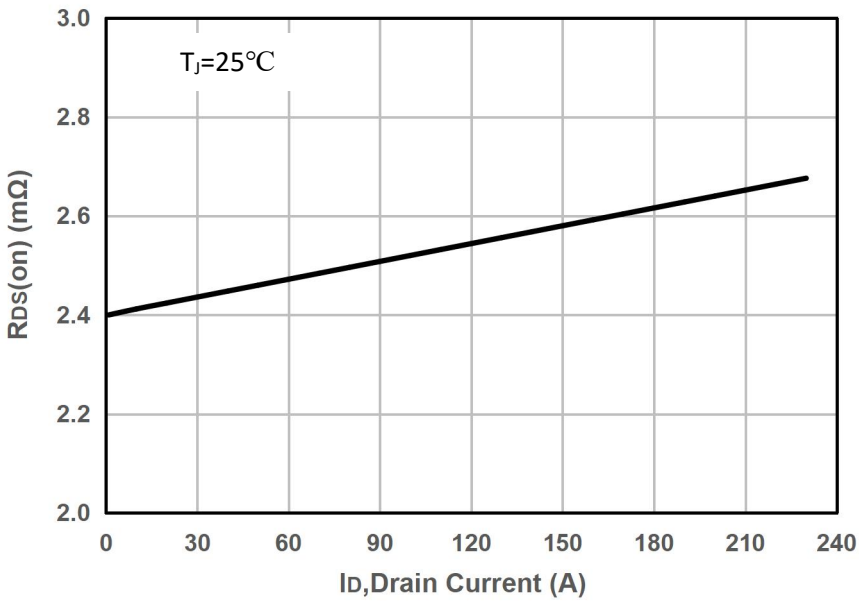


Figure 8. Normalized On-Resistance vs Junction Temperature

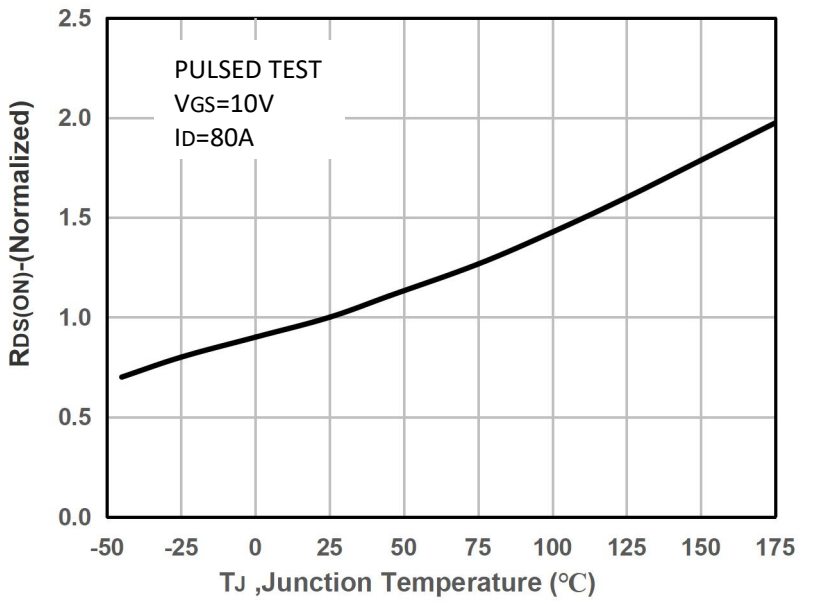


Figure 9. Normalized Threshold Voltage vs Junction Temperature

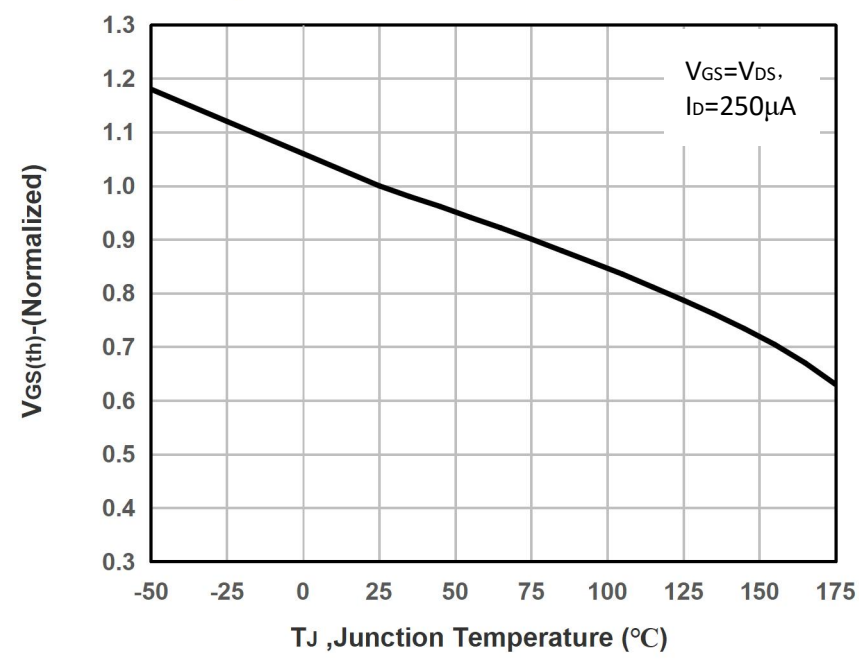


Figure 10. Normalized Breakdown Voltage vs Junction Temperature

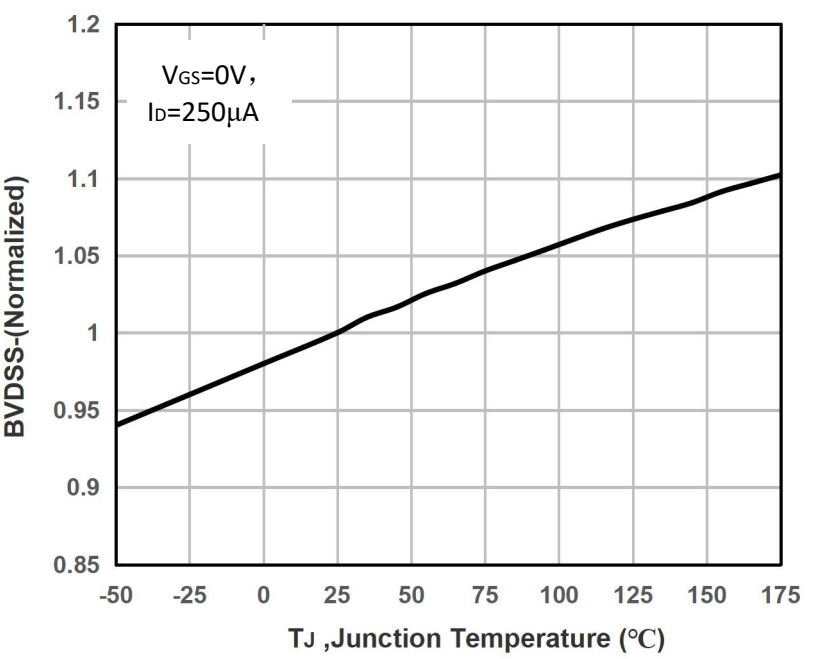


Figure 11. Capacitance Characteristics

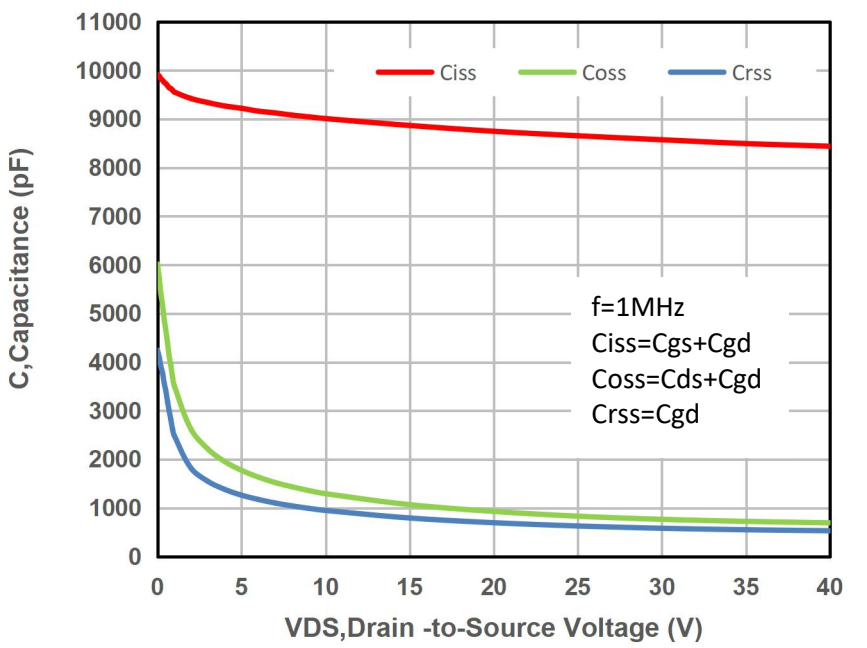


Figure 12. Typical Gate Charge vs Gage-Source Voltage

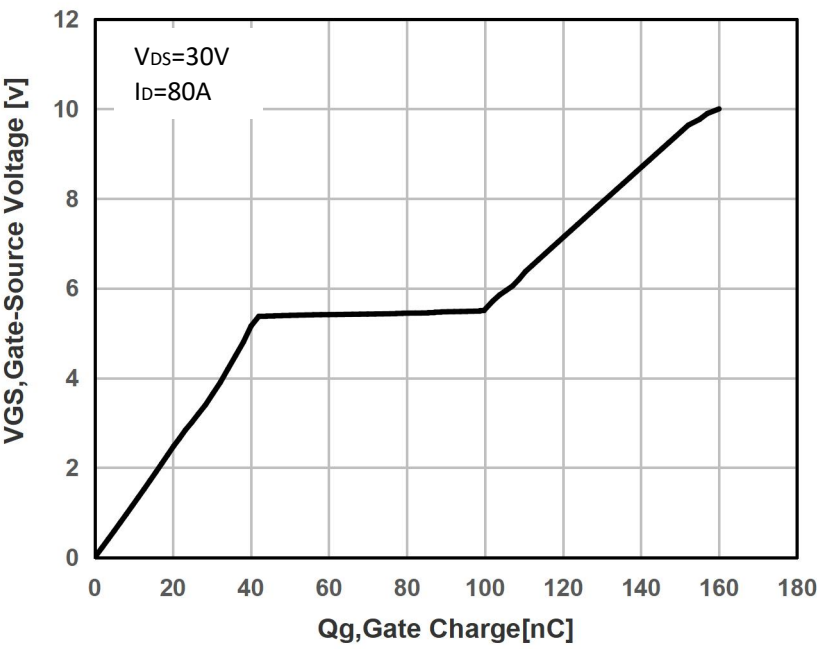
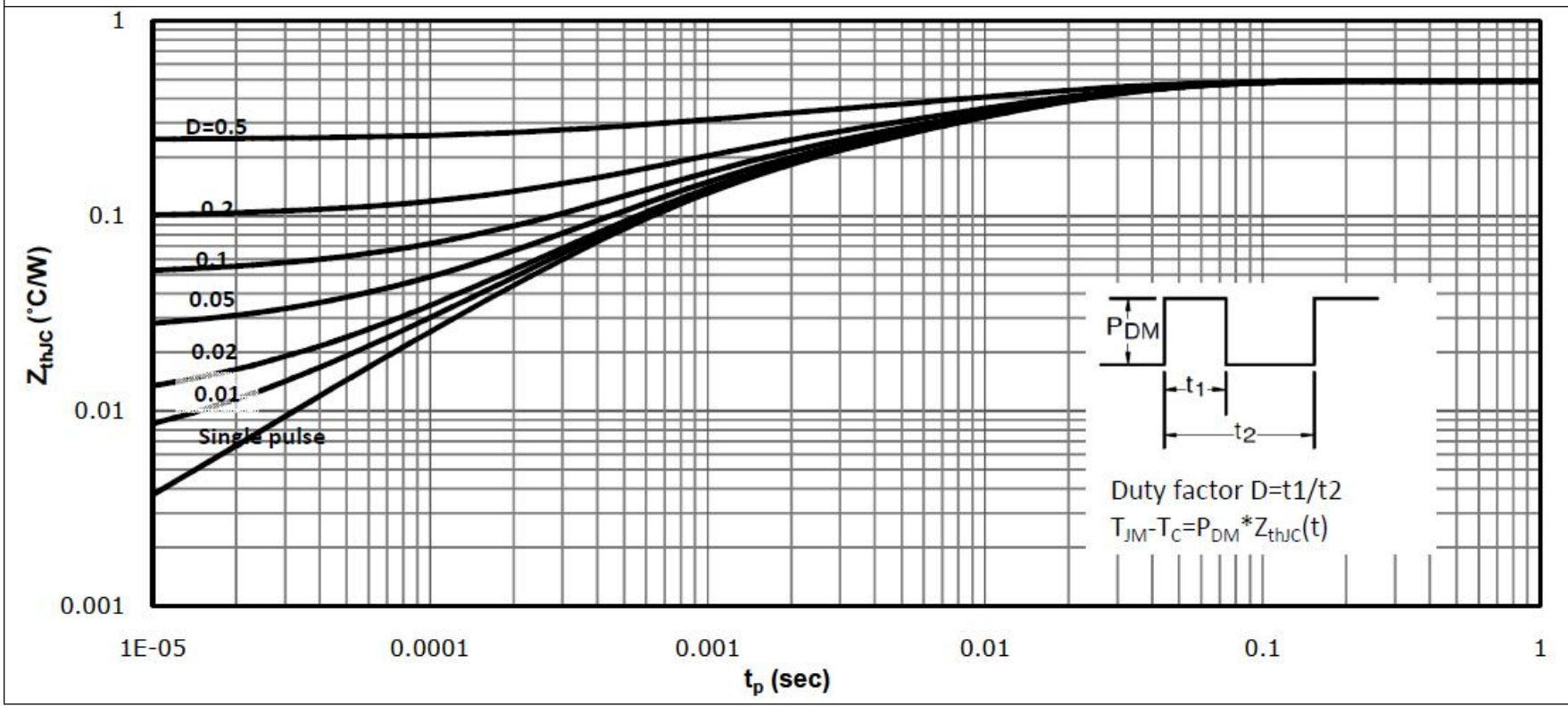
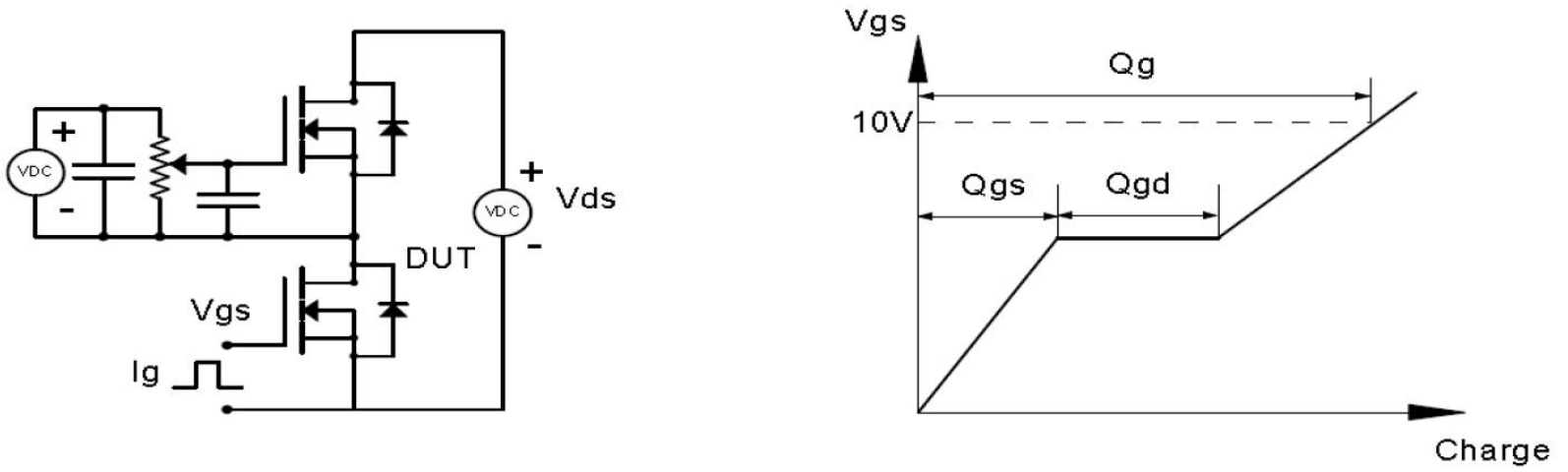


Figure 13. Transient Thermal Impedance

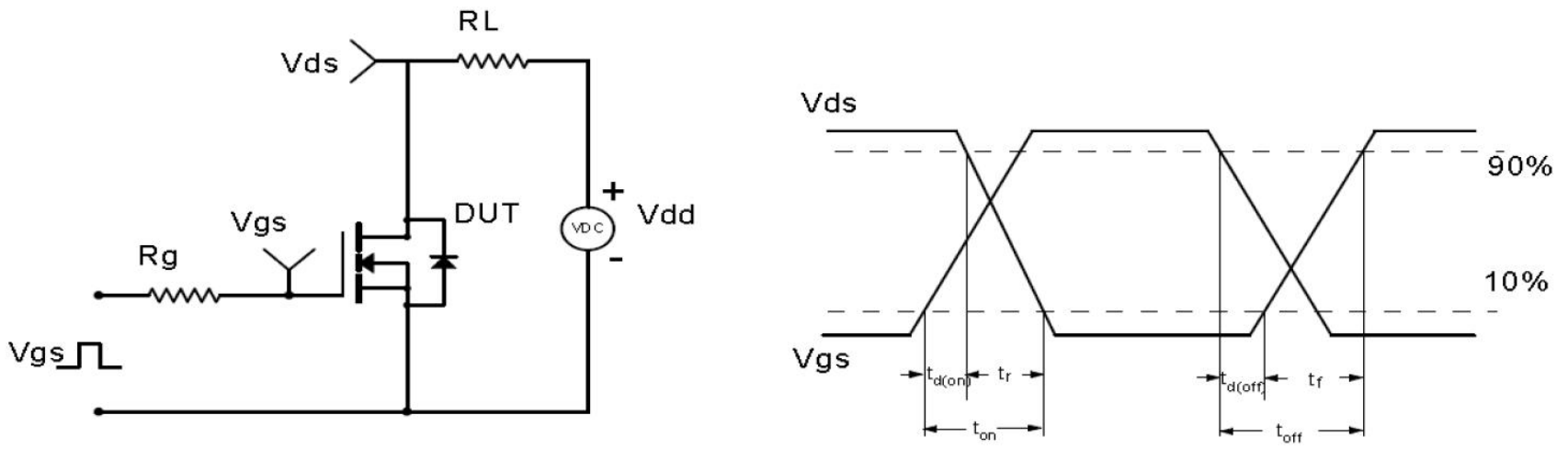


Test Circuit & Waveform

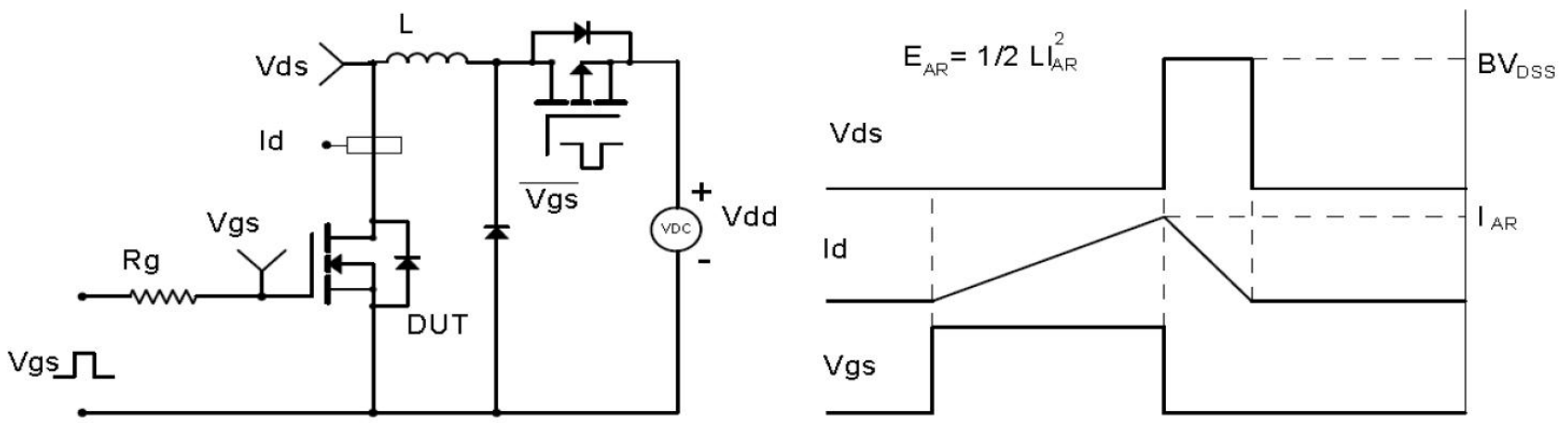
Gate Charge Test Circuit & Waveform



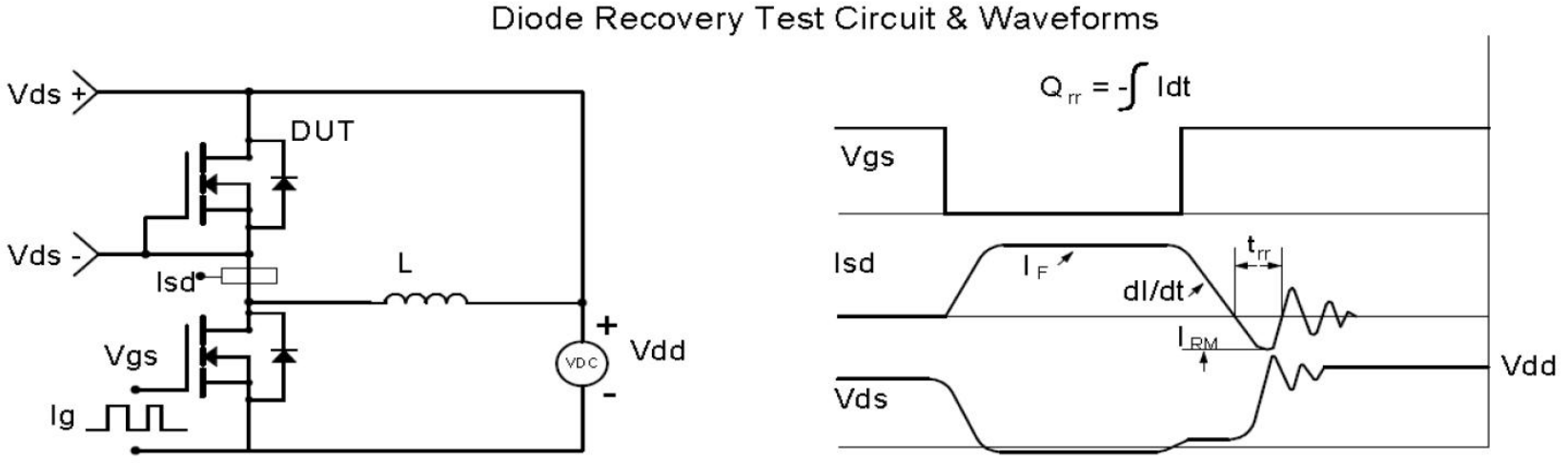
Resistive Switching Test Circuit & Waveforms



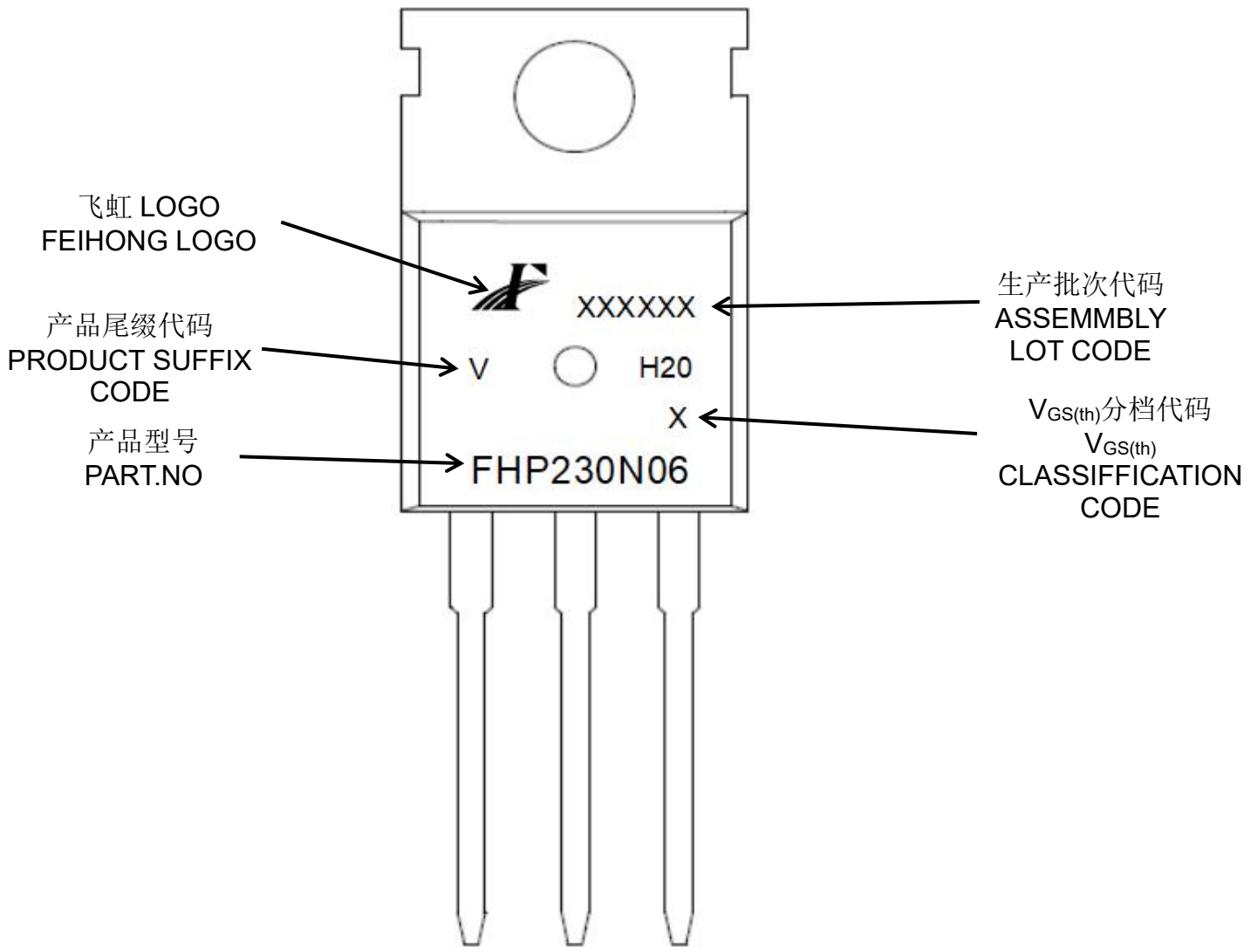
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



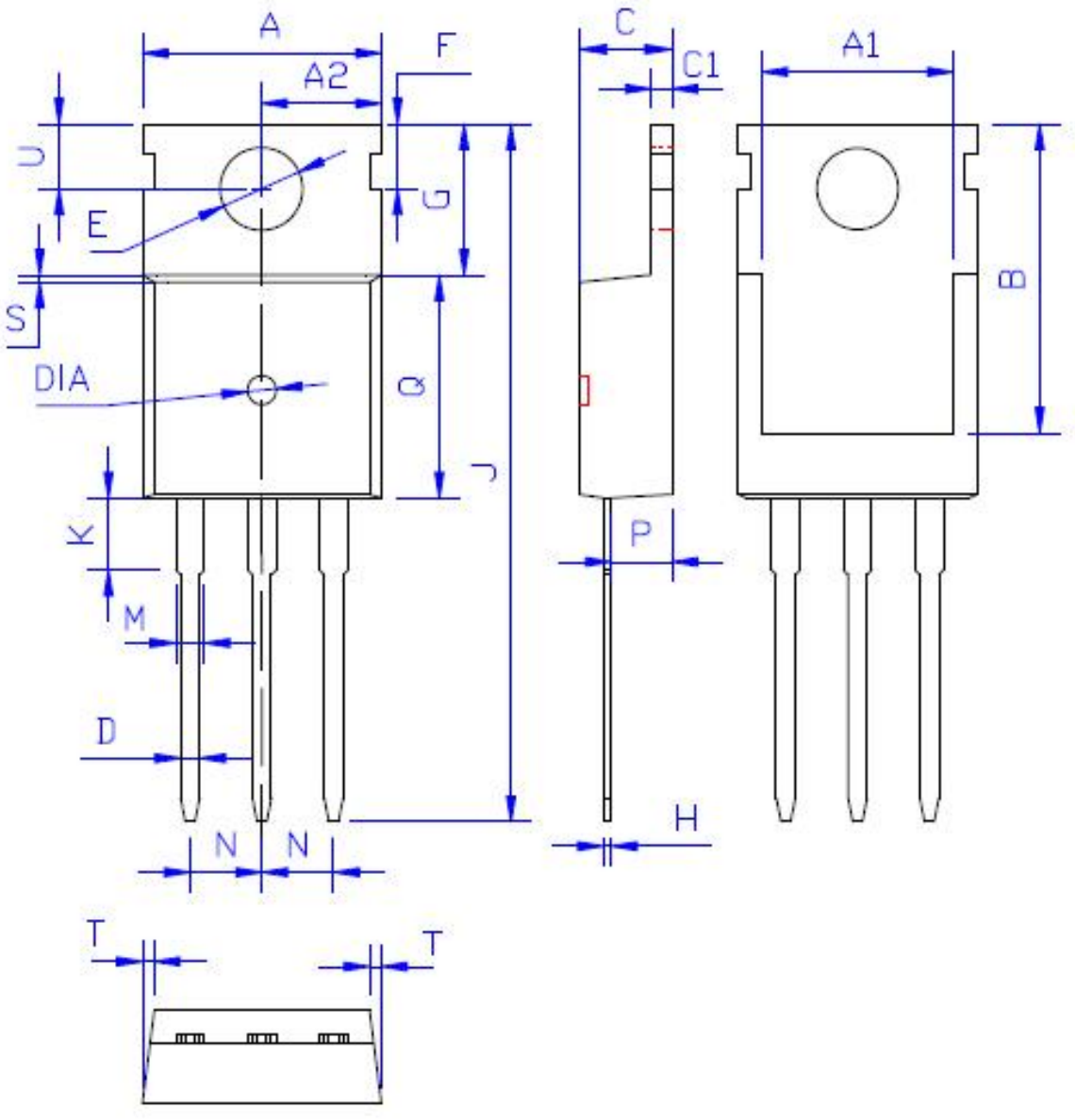
印记 Marking:


飞虹 LOGO
FEIHONG LOGO
产品尾缀代码
PRODUCT SUFFIX CODE
产品型号
PART.NO
XXXXXX
V
H20
X
FHP230N06
生产批次代码
ASSEMMBLY LOT CODE
VGS(th)分档代码
VGS(th) CLASSIFFICATION CODE

外形尺寸：

Package Dimension：

TO-220



DIM	MILLIMETERS
A	10.00±0.30
A1	8.00±0.30
A2	5.00±0.30
B	13.20±0.40
C	4.50±0.20
C1	1.30±0.20
D	0.80±0.20
E	3.60±0.20
F	3.00±0.30
G	6.60±0.40
H	0.50±0.20
J	28.88±0.50
K	3.00±0.30
M	1.30±0.30
N	Typical 2.54
P	2.40±0.40
Q	9.20±0.40
S	0.25±0.15
T	0.25±0.15
U	2.80±0.30
DIA	宽 1.50±0.10 深 0.50 MAX

（Unit：mm）