N 沟道增强型场效应晶体管
N-CHANNEL MOSFET
FHA45N30W

主要参数 MAIN CHARACTERISTICS

ID	45 A
VDSS	300 V
Rdson-typ（ @Vgs=10V）	61 mΩ
Qg-typ	90 nC

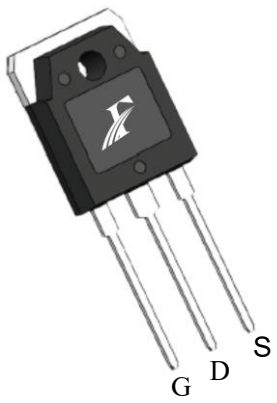
产品特性 FEATURES

低栅极电荷	Low gate charge
低 Crss (典型值 40 pF)	Low Crss (typical 40 pF)
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
高抗 dv/dt 能力	Improved dv/dt capability
符合 RoHS 标准	ROHS compliant

用途 APPLICATIONS

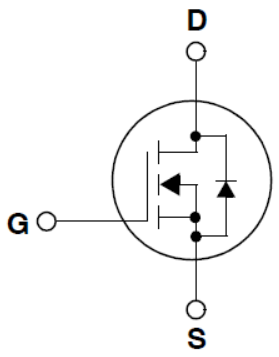
高频开关电源	High efficiency switch mode power supplies
逆变电源	Power management for inverter systems
UPS	Uninterrupible Power Supplies

封装形式 Package



TO-3PN
FHA series

等效电路 Equivalent Circuit



绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项目 **Parameter**	符号 **Symbol**	数值 **Value** FHA45N30W	单位 **Unit**
最高漏极－源极直流电压 Drain-Source Voltage	V_{DS}	300	V
连续漏极电流* Drain Current -continuous *	I_D（T_C=25℃）	45	A
	I_D（T_C=100℃)	28.5	A
最大脉冲漏极电流（注 1） Drain Current – pulse（note 1）	I_{DM}	180	A
最高栅源电压 Gate-Source Voltage	V_{GS}	±30	V
单脉冲雪崩能量（注 2） Single Pulsed Avalanche Energy（note 2）	E_{AS}	312.5	mJ
雪崩电流（注 1） Avalanche Current（note 1）	I_{AS}	25	A
二极管反向恢复最大电压变化速率（注 3） Peak Diode Recovery dv/dt（note 3）	dv/dt	5.0	V/ns
耗散功率 Power Dissipation	P_D （TC=25℃）	312.5	W
	-Derate above 25℃	2.5	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T_J，T_{STG}	150，–55 to 150	℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	℃

*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－源击穿电压 Drain-Source Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	300	350	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA, referenced to 25℃	-	0.03	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=300V,V_{GS}=0V, T_C=25℃	-	-	1	μA
		V_{DS}=240V, T_C=125℃	-	-	100	μA
栅极体漏电流 Gate-body leakage current	I_{GSS}（F/R）	V_{DS}=0V, V_{GS} =±30V	-	-	±100	nA
通态特性 **On-Characteristics**						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = VGS , I_D=250μA	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V , I_D=25A	-	61	80	mΩ
正向跨导 Forward Transconductance	gfs	V_{DS} = 15V, I_D=25A（note 4）	-	5	-	S
动态特性 **Dynamic Characteristics**						
栅电阻 Gate Resistance	Rg	f=1.0MHz,V_{DS} OPEN	-	1.5	-	Ω
输入电容 Input capacitance	Ciss	V_{DS}=25V, V_{GS} =0V, f=1.0MHz	-	4260	-	pF
输出电容 Output capacitance	Coss		-	650	-	
反向传输电容 Reverse transfer capacitance	Crss		-	40	-	
开关特性 **Switching Characteristics**						
延迟时间 Turn-On delay time	td(on)	V_{DS}=150V, I_D=45A, R_G=20Ω V_{GS} =10V （note 4，5）	-	80	-	ns
上升时间 Turn-On rise time	tr		-	230	-	ns
延迟时间 Turn-Off delay time	td(off)		-	140	-	ns
下降时间 Turn-Off Fall time	tf		-	183	-	ns
栅极电荷总量 Total Gate Charge	Qg	V_{DS} =240V , I_D=45A , V_{GS} =10V （note 4，5）	-	95	-	nC
栅－源电荷 Gate-Source charge	Qgs		-	20	-	nC
栅－漏电荷 Gate-Drain charge	Qgd		-	37	-	nC
漏－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		-	-	45	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	180	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=45A	-	-	1.2	V
反向恢复时间 Reverse recovery time	trr	V_{GS}=0V, I_S=45A ,dI_F/dt=100A/μs (note 4)	-	460	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	1.15	-	μC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	FHA45N30W	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.4	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	40	℃/W

注释：
1：脉冲宽度由最高结温限制
2：L=1mH, IAS=25A, VDD=50V, RG=25 Ω,起始结温 TJ=25℃
3：ISD ≤45A,di/dt ≤200A/μs,VDD≤BVDSS,起始结温 TJ=25℃
4：脉冲测试：脉冲宽度 ≤300μs,占空比≤2%
5：基本与工作温度无关

Notes:
1：Pulse width limited by maximum junction temperature
2： L=1mH, IAS=30A, VDD=50V, RG=25 Ω ,Start TJ=25℃;
3：ISD ≤45A,di/dt ≤200A/μs,VDD≤BVDSS, Starting TJ=25℃
4：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%
5：Essentially independent of operating temperature

特性曲线
（ELECTRICAL CHARACTERISTICS (curves)）

Figure 1 Safe Operating Area

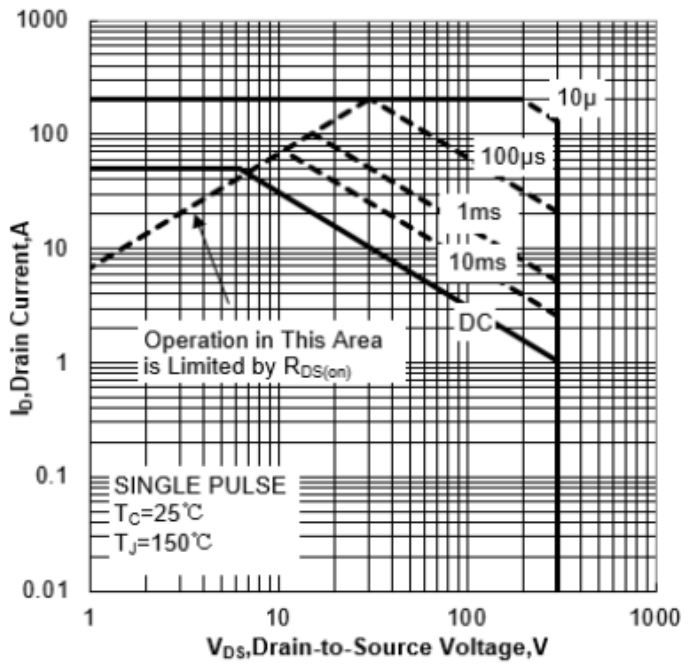


Figure 2 Power Diss ipation

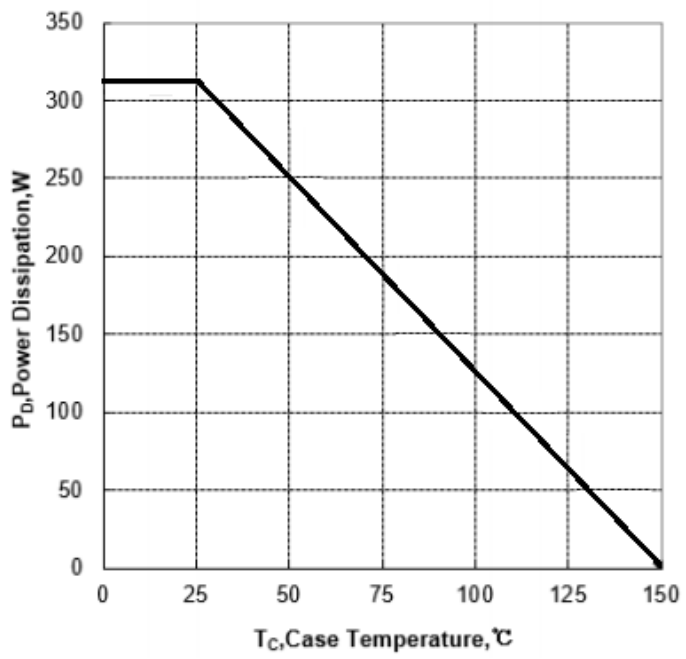


Figure 3 Max Thermal Impendance

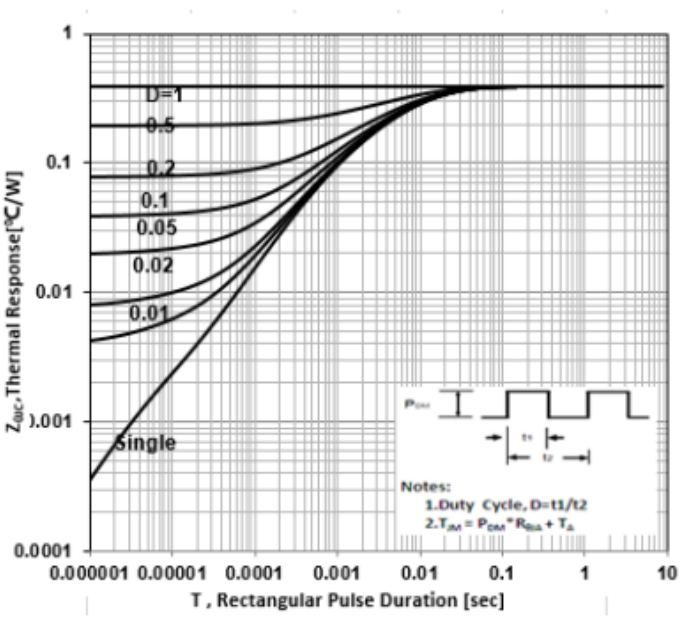


Figure 4 Typical Output Characteristics

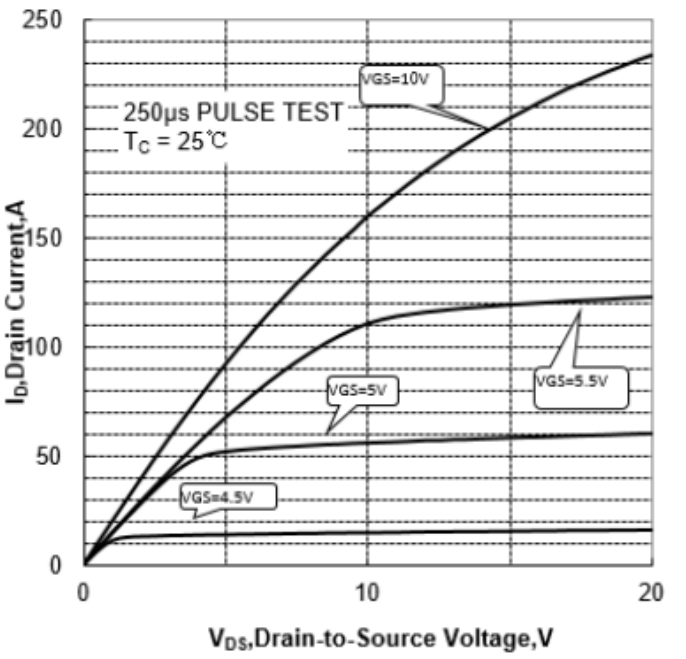


Figure 5 Typical Transfer Characteristics

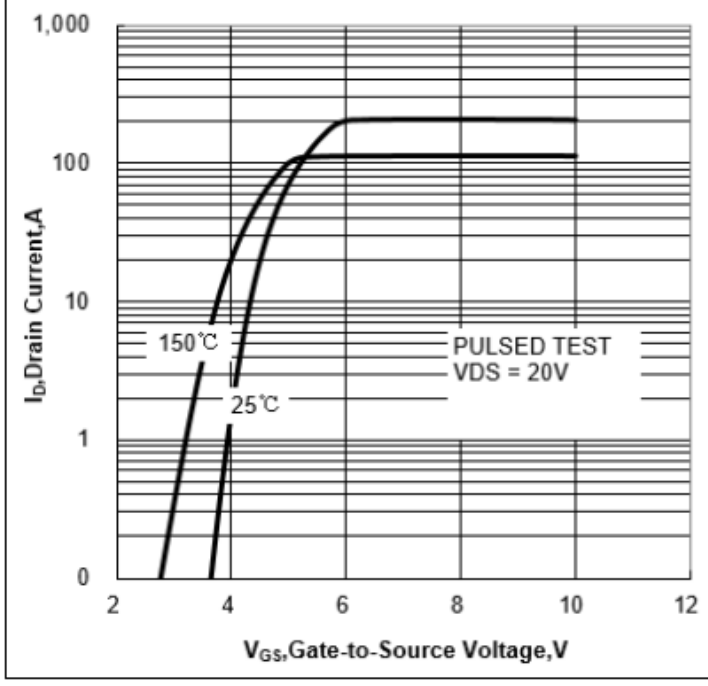


Figure 6 Typical Drain to Source ON Resistance vs Drain Current

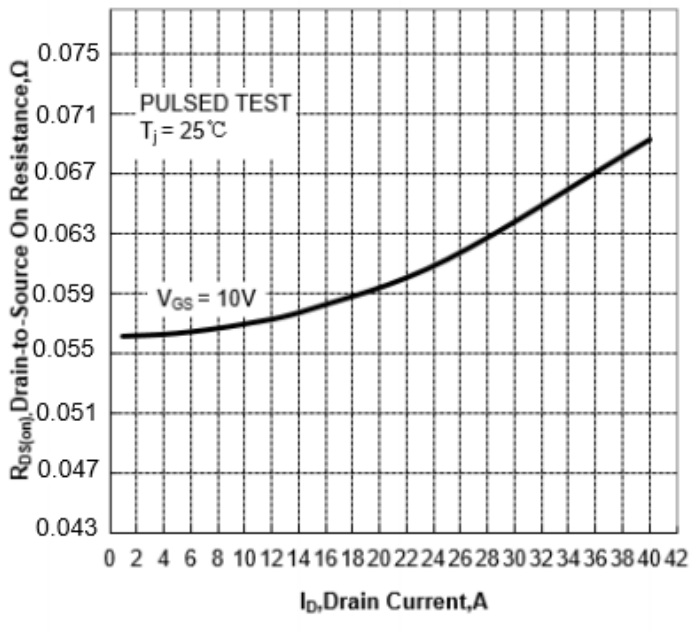


Figure 7 Typical Drian to Source on Resistance vs Junction Temperature

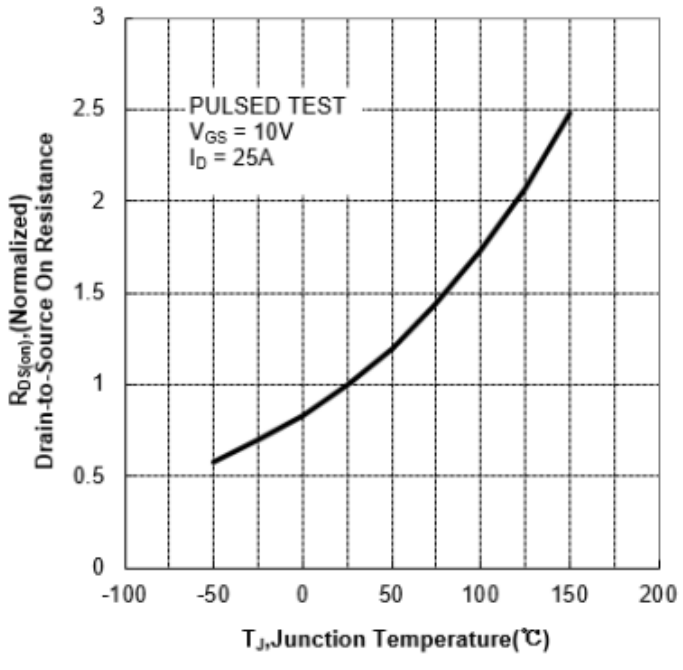


Figure 8 Typical Theshold Voltage vs Junction Temperature

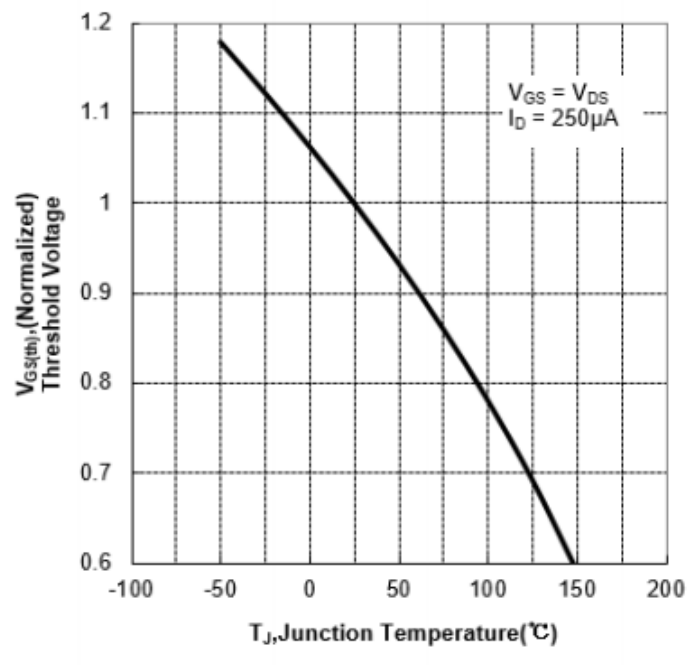


Figure 9 Typical Breakdown Voltage vs Junction Temperature

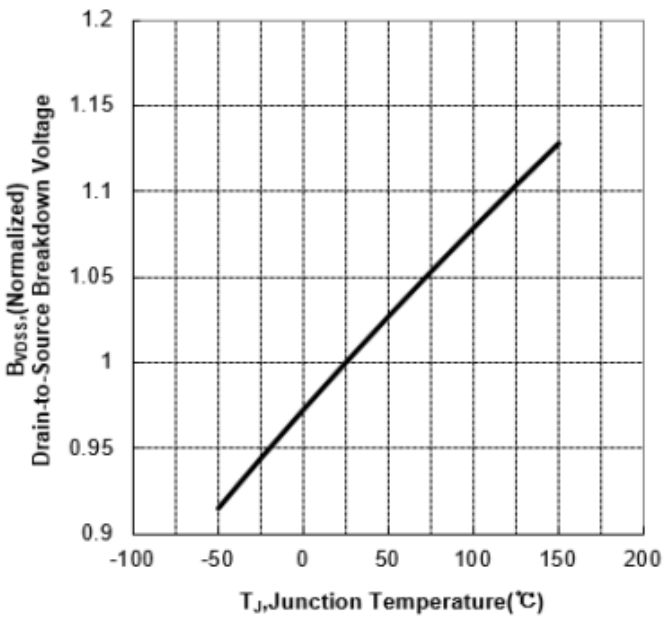


Figure 10 Typical Capacitance vs Drain to Source Voltage

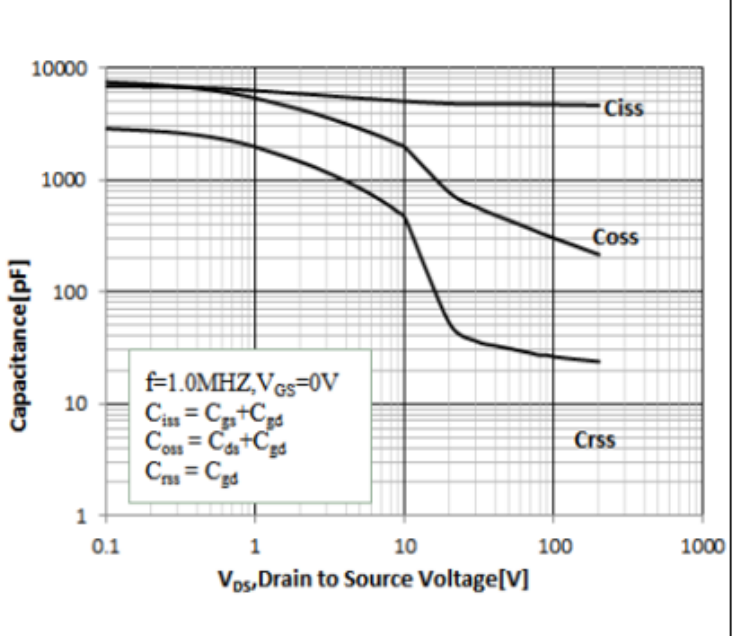
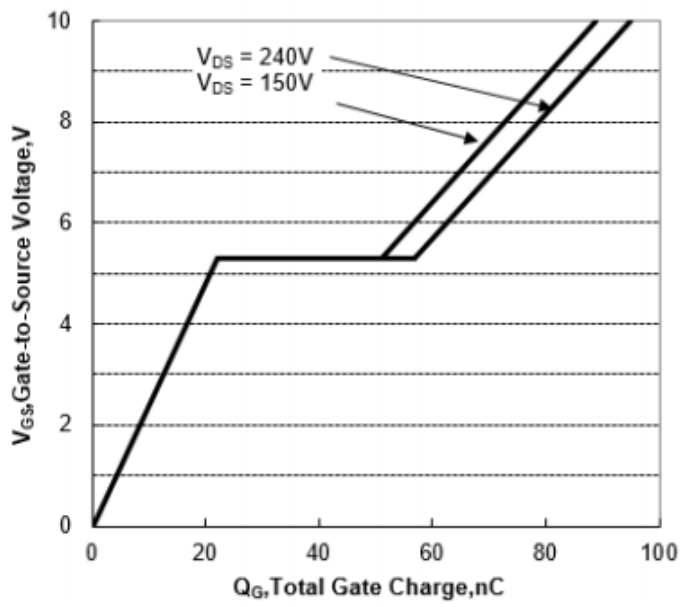
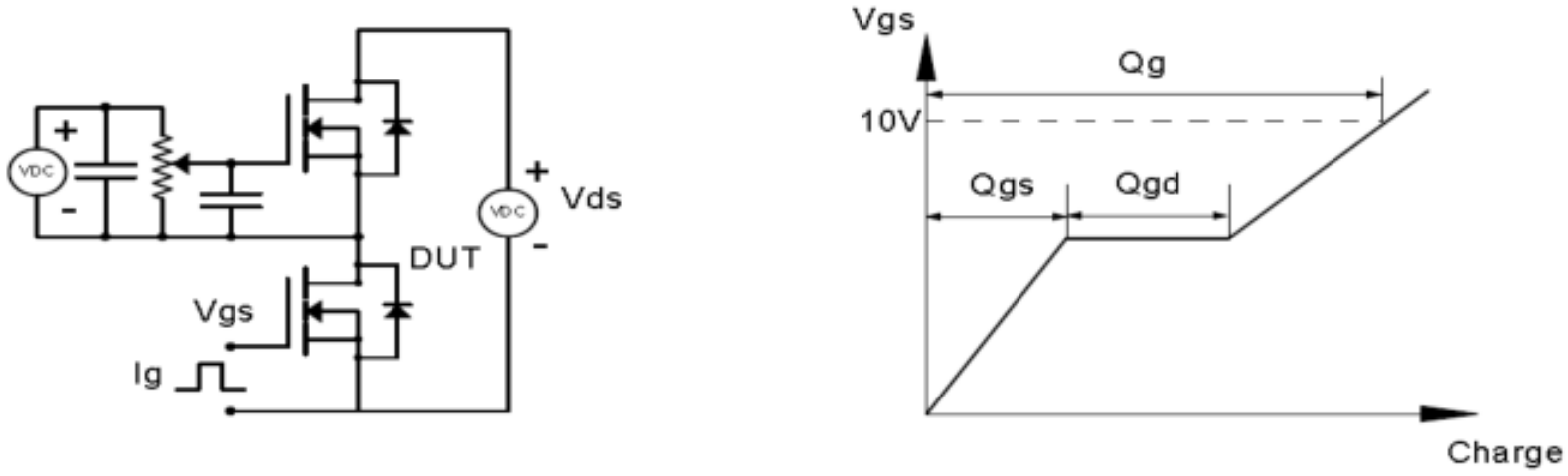


Figure 11 Typical Gate Charge vs Gate to Source Voltage

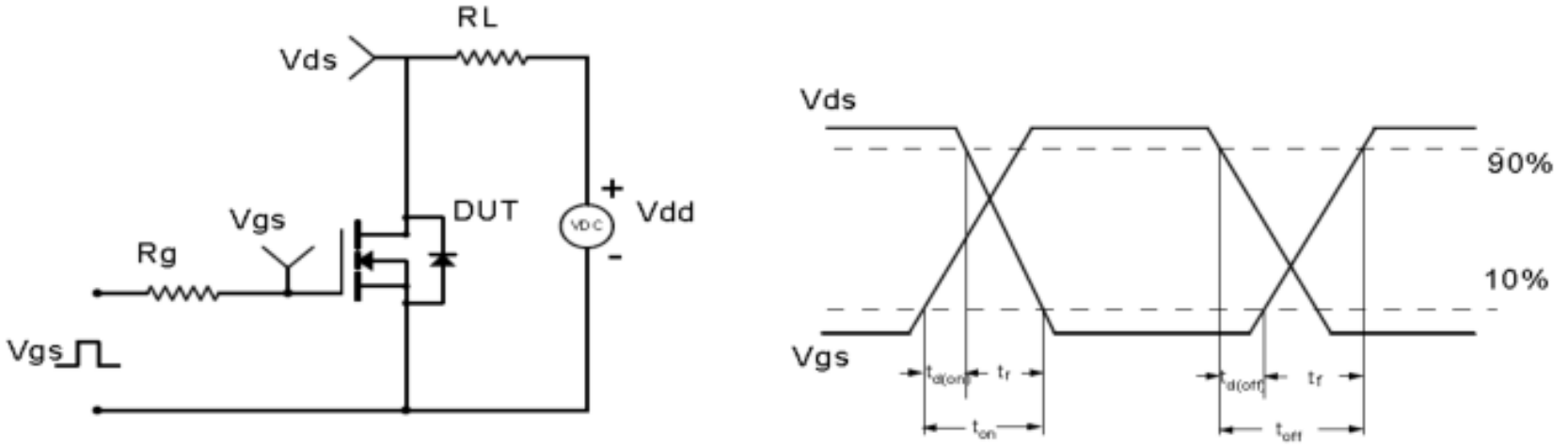


Test Circuit & Waveform

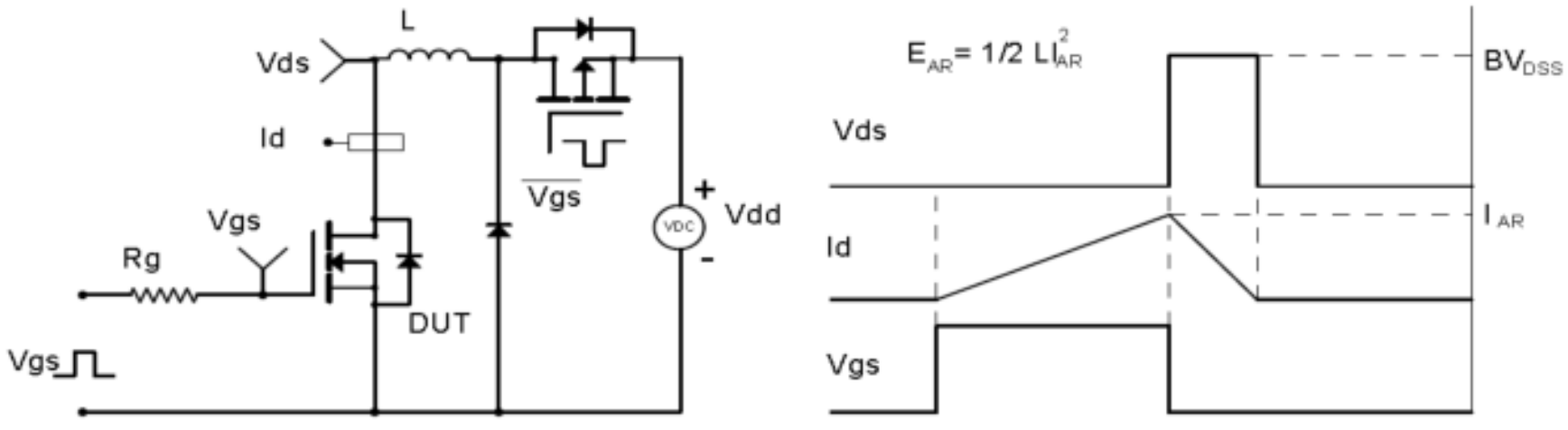
Gate Charge Test Circuit & Waveform



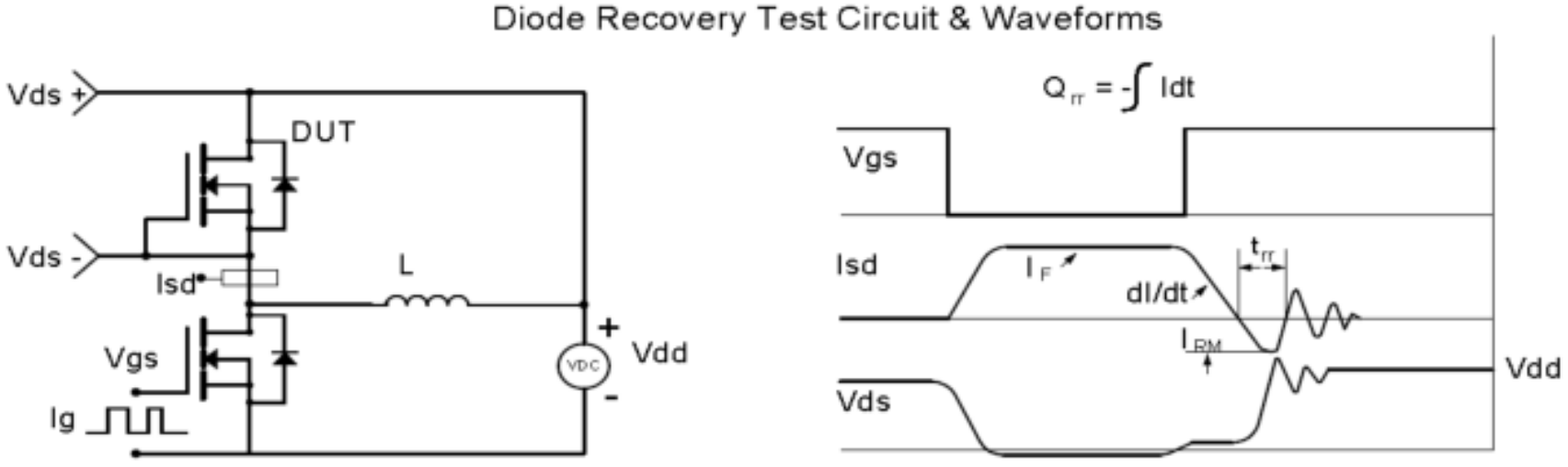
Resistive Switching Test Circuit & Waveforms



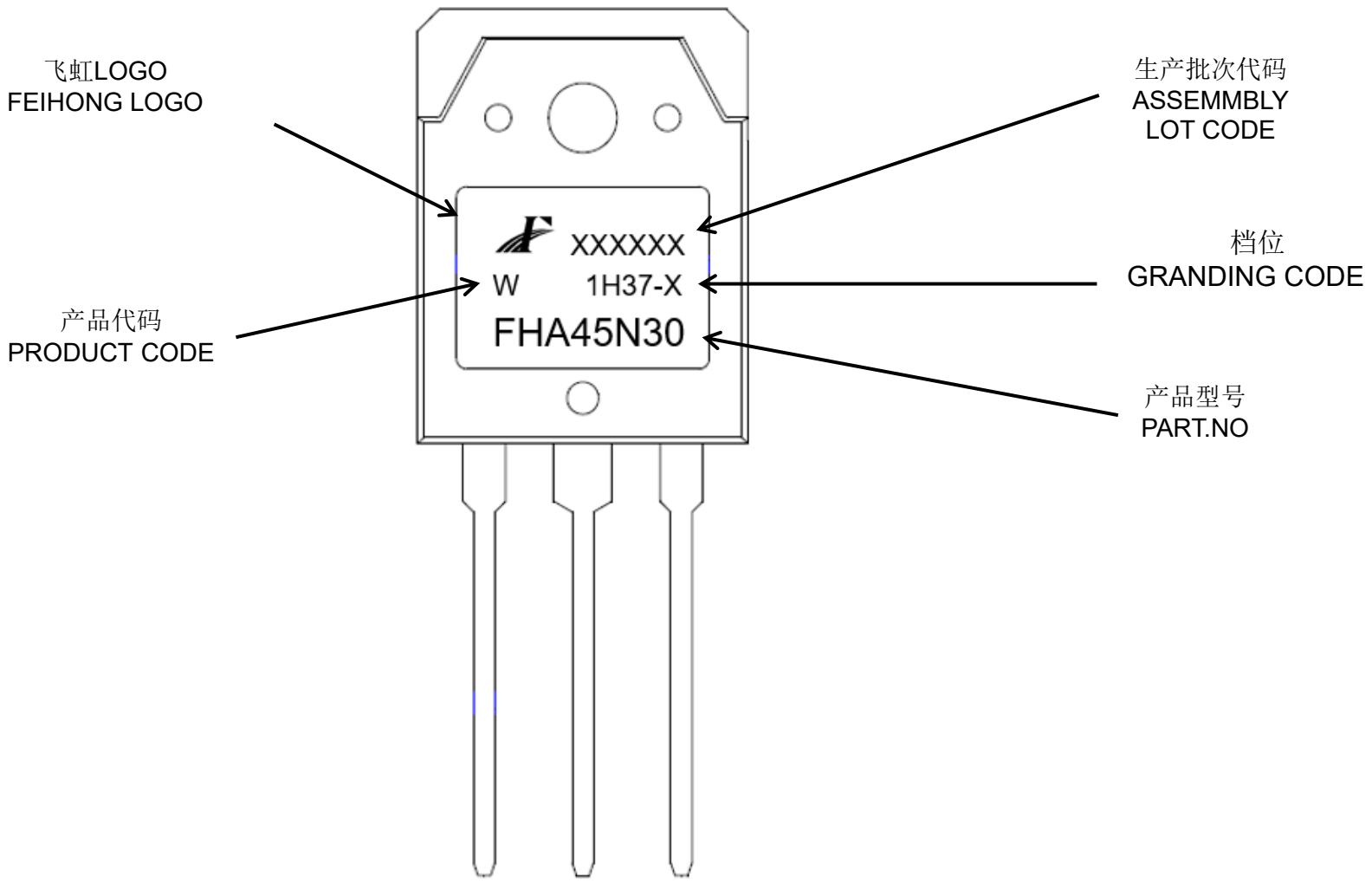
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



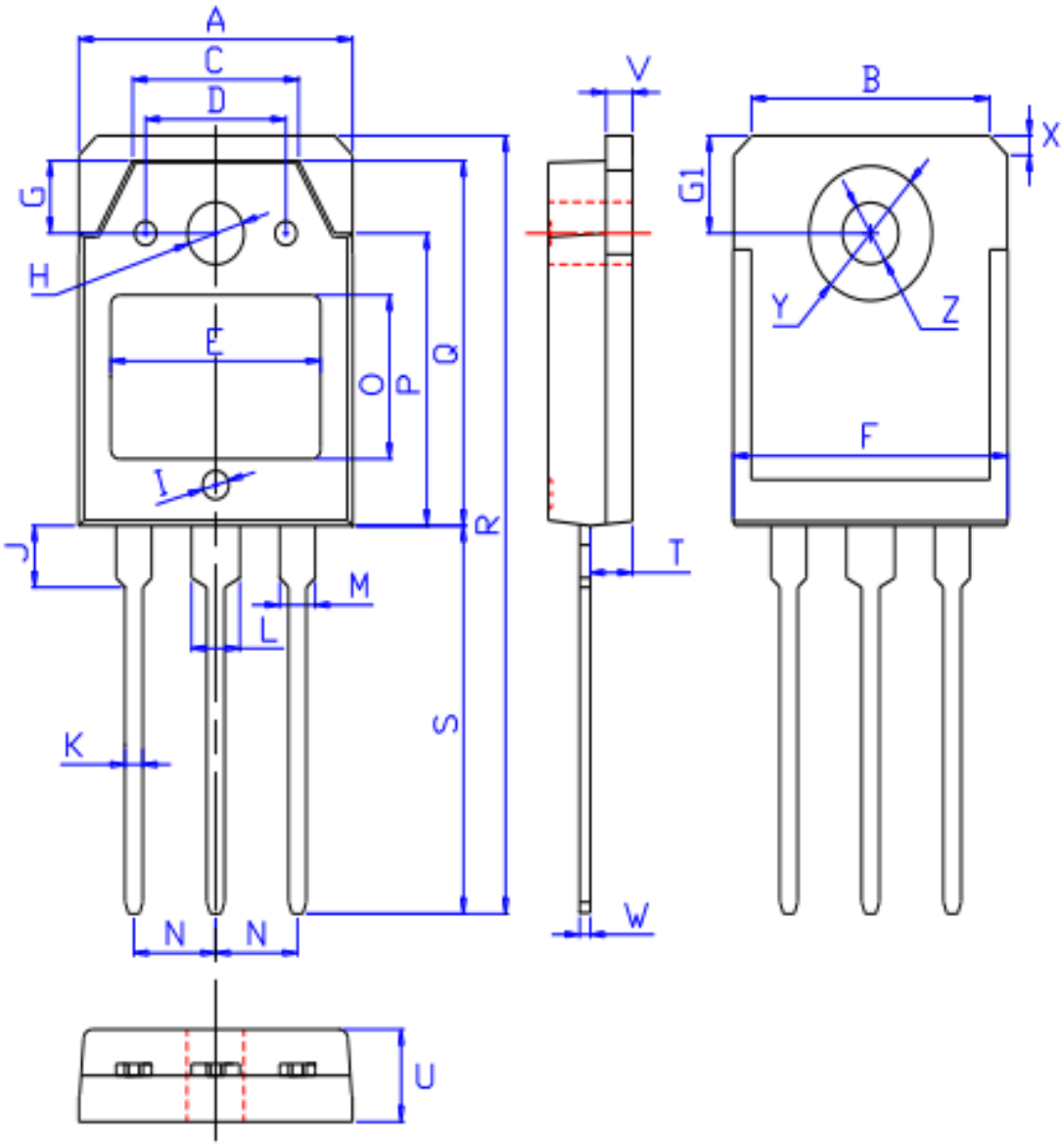
印记 Marking:


飞虹LOGO
FEIHONG LOGO
产品代码
PRODUCT CODE
XXXXXX
W 1H37-X
FHA45N30
生产批次代码
ASSEMMBLY
LOT CODE
档位
GRANDING CODE
产品型号
PART.NO

外形尺寸：

Package Dimension：

TO-3PN



DIM	MILLIMETERS
A	15.60±0.30
B	13.60±0.30
C	9.50±0.30
D	8.00±0.30
E	11.85±0.30
F	15.65±0.30
G	3.80±0.30
G1	5.00±0.30
H	Φ3.50±0.30
I	Φ1.50±0.30 深 0.15±0.15
J	3.20±0.30
K	1.00±0.15
L	3.10±0.15
M	2.10±0.15
N	5.45±0.30
O	8.40±0.30
P	13.90±0.30
Q	18.70±0.30
R	40.00±0.60
S	20.00±0.40
T	2.40±0.30
U	4.80±0.30
V	1.50±0.15
W	0.60±0.15
X	1.80±0.40
Y	7.00±0.30
Z	3.20±0.30

（Units：mm）