N 沟道增强型场效应晶体管
N-CHANNEL MOSFET
FHA150N06C

主要参数 MAIN CHARACTERISTICS

ID	150 A
VDSS	55 V
Rdson-typ（ @Vgs=10V）	7.2 mΩ
Qg-typ	118nC

用途 APPLICATIONS

12V逆变电源	Power management for 12V inverter systems
同步整流	Synchronous Rectification

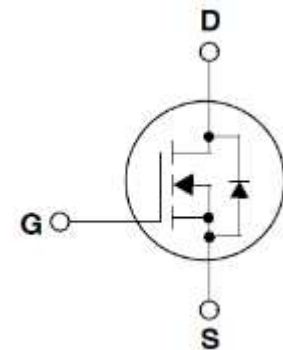## 产品特性 FEATURES

低栅极电荷	Low gate charge
低 Crss (典型值 850pF)	Low Crss (typical 850pF)
开关速度快	Fast switching
100%经过雪崩测试	100% avalanche tested
高抗 dv/dt 能力	Improved dv/dt capability
RoHS 产品	RoHS product
平面工艺	Plane process

封装形式 Package
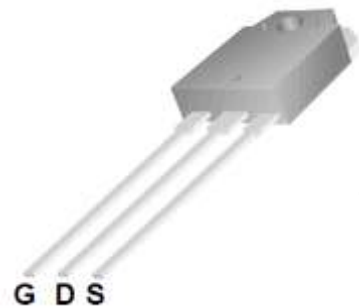
TO-3PN
FHA series

G D S

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 FHA150N06C	单位 Unit
最高漏极－源极直流电压 Drain-Source Voltage	V$_{DS}$	55	V
连续漏极电流* Drain Current -continuous *	I$_D$（Tc=25℃）	150	A
	I$_D$（Tc=100℃）	105	A
最大脉冲漏极电流（注 1） Drain Current – pulse（note 1）	I$_{DM}$	450	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$_{AS}$	1500	mJ
雪崩电流（注 1） Avalanche Current（note 1）	I$_{AR}$	25	A
重复雪崩能量（注 1） Repetitive Avalanche Current（note 1）	E$_{AR}$	20	mJ
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℃）	290	W
	-Derate above 25℃	1.69	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T$_J$，T$_{STG}$	-55～+175	℃
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	55	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta TJ$	I_D=250µA, referenced to 25℃	-	0.055	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=55V,V_{GS}=0V, T_C=25℃	-	-	1	µA
		V_{DS}=44V, T_C=125℃	-	-	100	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	2.0	3.0	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V , I_D=40A	-	7.2	11.5	mΩ
正向跨导 Forward Transconductance	gfs	V_{DS} = 20V, I_D=40A（note 4）	40	-	-	S
动态特性 **Dynamic Characteristics**						
栅电阻 Gate Resistance	Rg	f=1.0MHz, V_{DS} OPEN	-	1.7	-	Ω
输入电容 Input capacitance	Ciss	V_{DS}=25V, V_{GS} =0V, f=1.0MHz	-	3000	-	pF
输出电容 Output capacitance	Coss		-	2100	-	
反向传输电容 Reverse transfer capacitance	Crss		-	850	-	
开关特性 **Switching Characteristics**						
延迟时间 Turn-On delay time	td(on)	V_{DS}=30V, I_D=75A, R_G=4.5Ω V_{GS} =10V （note 4，5）	-	14	-	ns
上升时间 Turn-On rise time	tr		-	101	-	ns
延迟时间 Turn-Off delay time	td(off)		-	50	-	ns
下降时间 Turn-Off Fall time	tf		-	65	-	ns
栅极电荷总量 Total Gate Charge	Qg	V_{DS} =30V , I_D=75A , V_{GS} =10V （note 4，5）	-	118	-	nC
栅－源电荷 Gate-Source charge	Qgs		-	30	-	nC
栅－漏电荷 Gate-Drain charge	Qgd		-	55	-	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		Is	-	-	150	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	450	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, Is=62A	-	0.9	1.3	V
反向恢复时间 Reverse recovery time	trr	V_{GS}=0V, Is=62A ,dI_F/dt=100A/µs (note 4)	-	69	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	143	-	nC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	最大值 Max	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.31	℃/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, I_{AS}=25A, V_{DD}=44V, R_G=25 Ω,起始结温 T_J=25℃

3：I_{SD} ≤150A,di/dt ≤300A/μs,V_{DD}≤BV_{DSS},起始结温 T_J=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, I_{AS}=25A, V_{DD}=44V, R_G=25 Ω,Starting T_J=25℃

3：I_{SD} ≤150A,di/dt ≤300A/μs,V_{DD}≤BV_{DSS}, Starting T_J=25℃

4：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2％

5：Essentially independent of operating temperatur

特性曲线
Typical Characteristics

Fig. 1. Output Characteristics @ 25°C

V_{GS} = 10V, 9V, 8V, 7V, 6V, 5V

I_D - Amperes vs V_{DS} - Volts
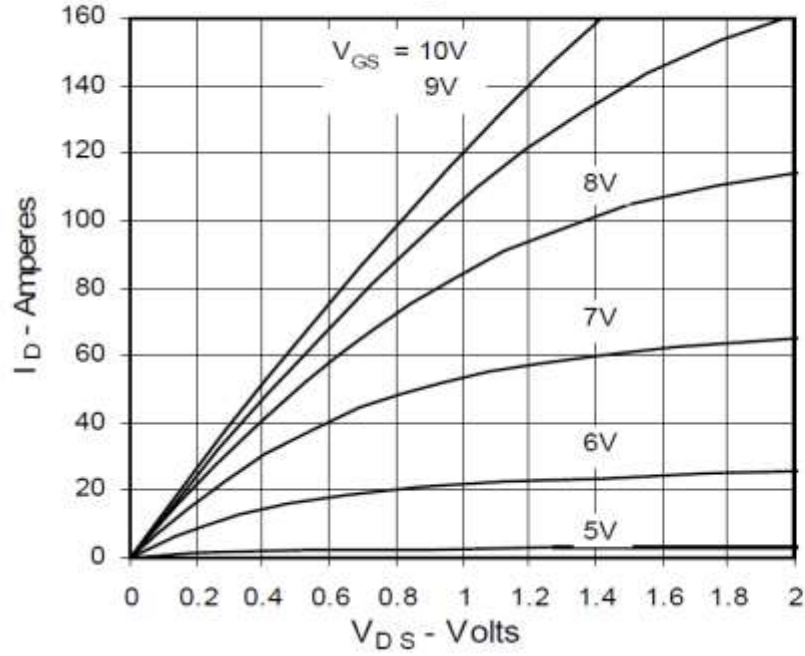
Fig. 2. Extended Output Characteristics @ 25°C

V_{GS} = 10V, 9V, 8V, 7V, 6V, 5V

I_D - Amperes vs V_{DS} - Volts
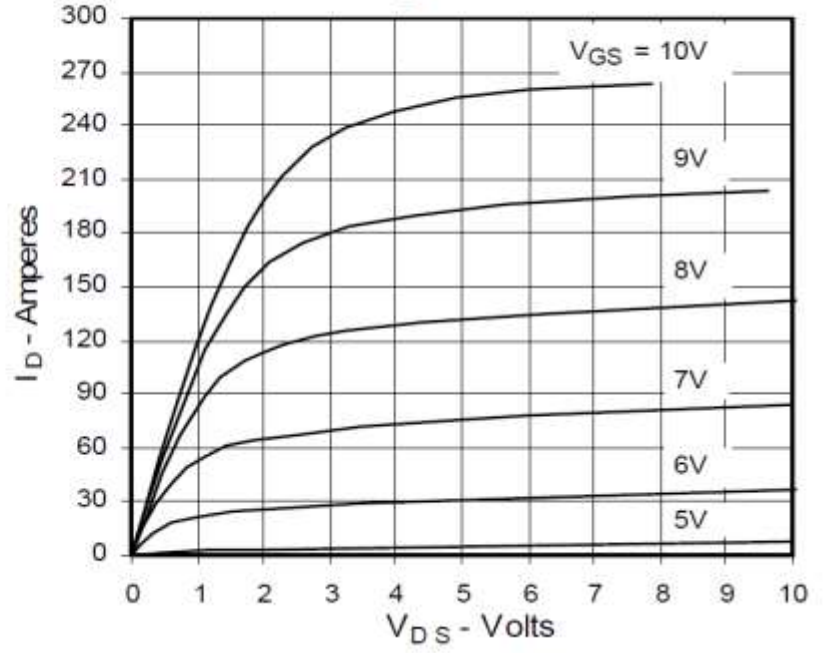
Fig. 3. Output Characteristics @ 150°C

V_{GS} = 10V, 9V, 8V, 7V, 6V, 5V

I_D - Amperes vs V_{DS} - Volts
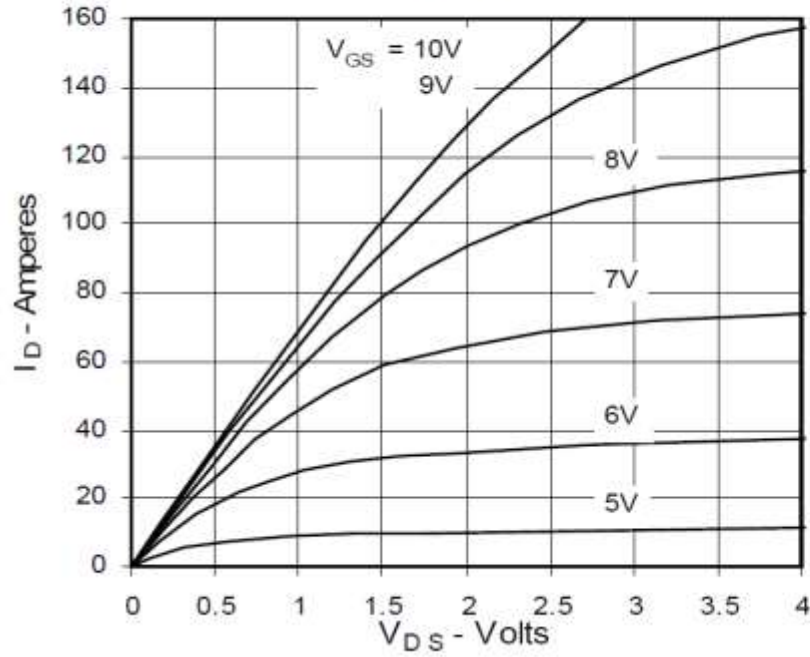
Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

V_{GS} = 10V

I_D = 150A, I_D = 75A

$R_{DS(on)}$ - Normalized vs T_J - Degrees Centigrade
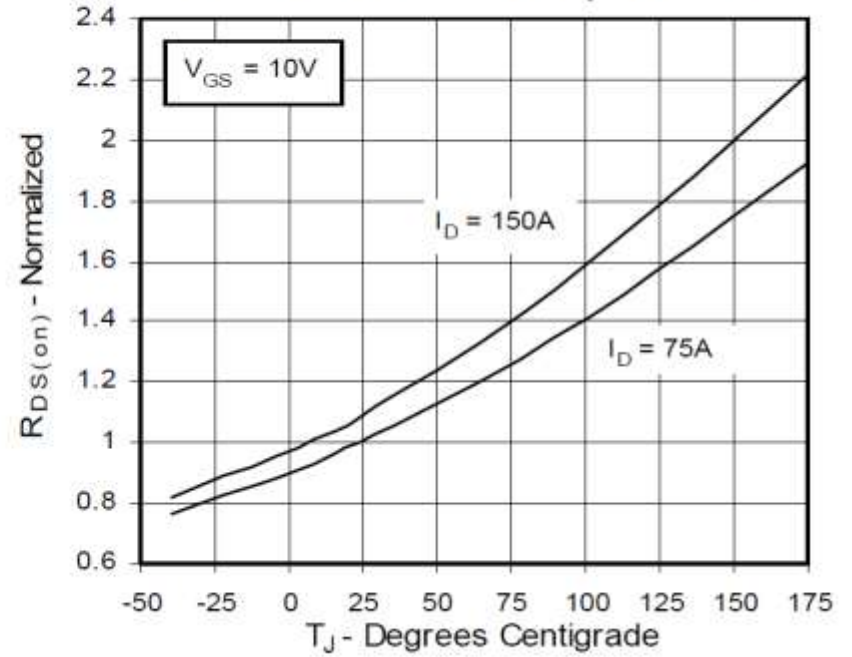
Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Drain Current

T_J = 175°C, V_{GS} = 10V, V_{GS} = 15V, T_J = 25°C

$R_{DS(on)}$ - Normalized vs I_D - Amperes
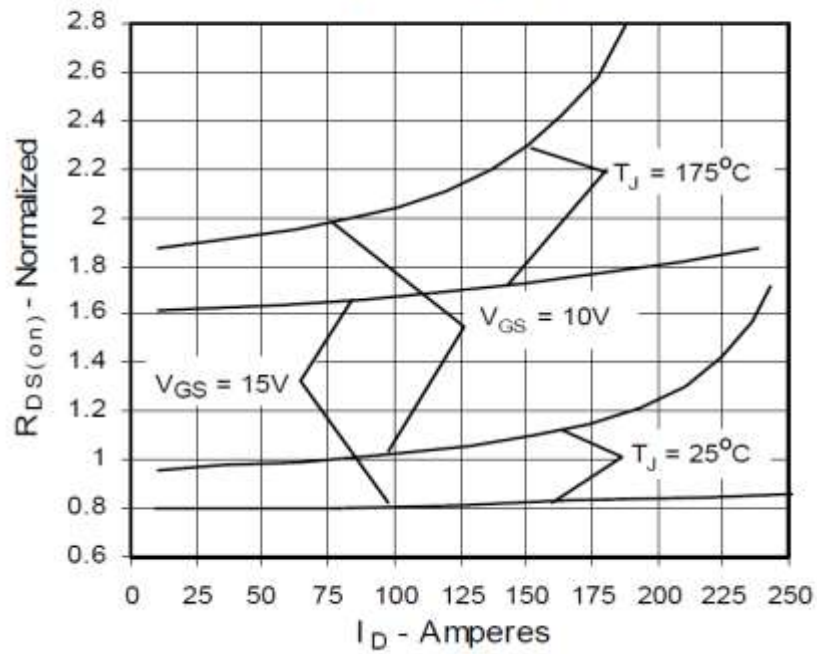
Fig. 6. Drain Current vs. Case Temperature

I_D, Drain Current [A] vs T_C, Case Temperature [°C]
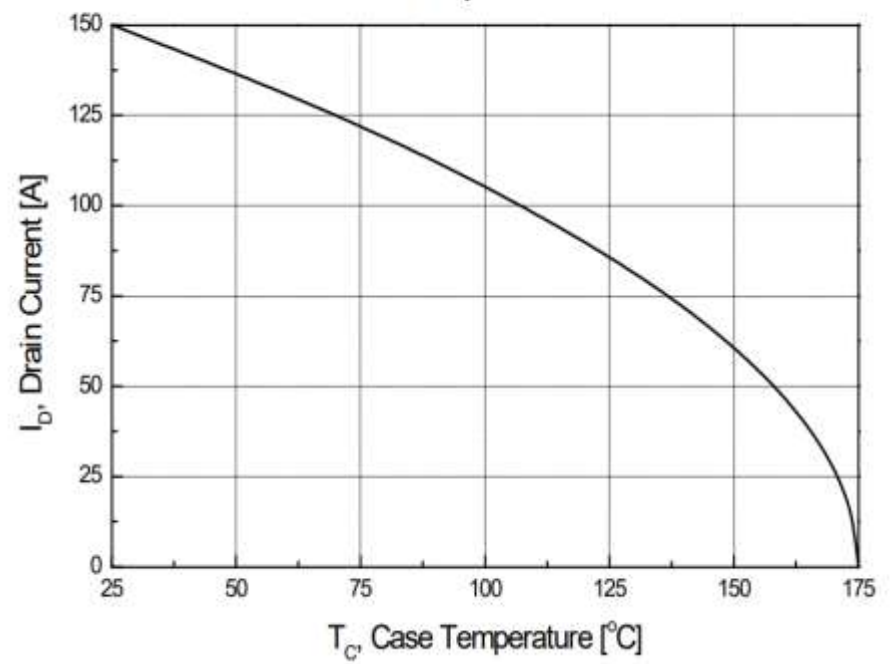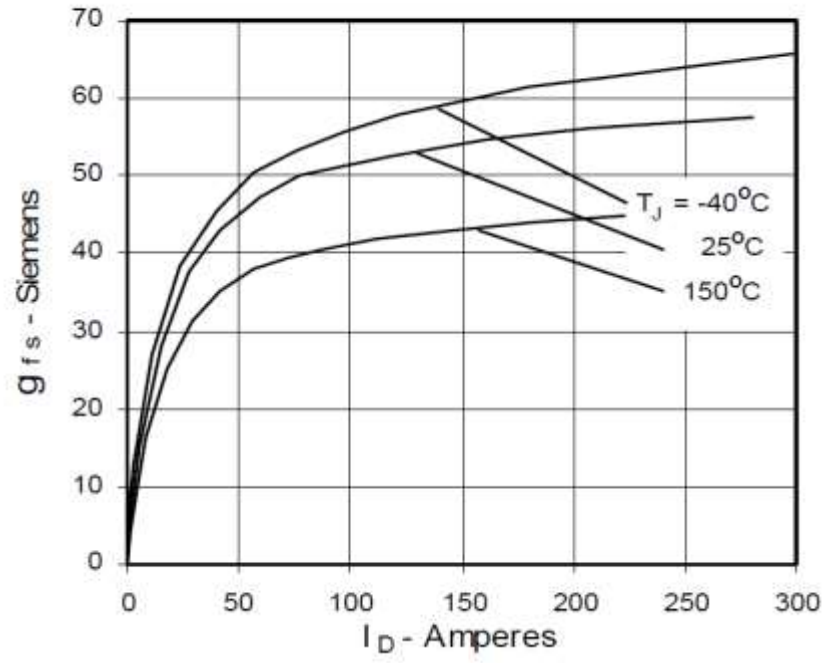
Fig. 7. Input Admittance
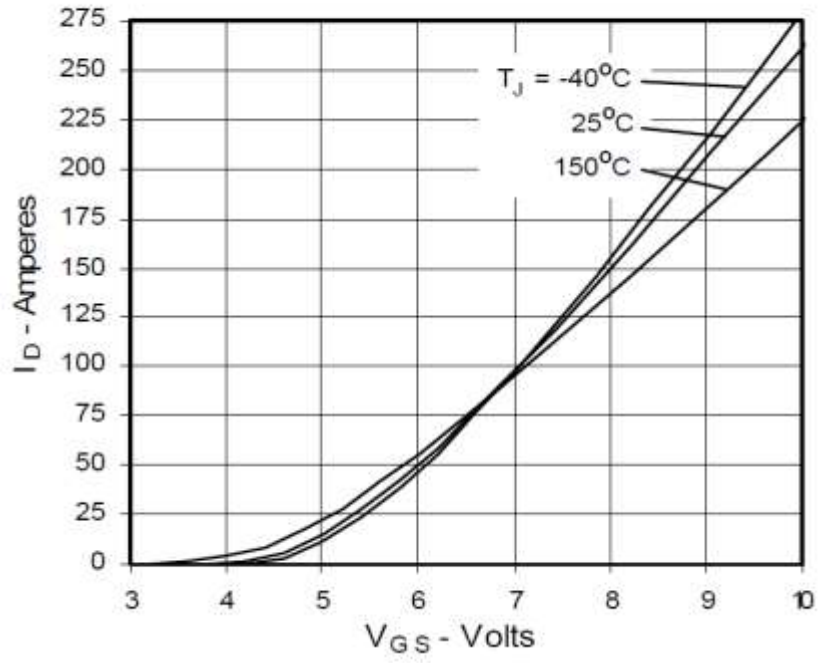
Fig. 8. Transconductance

Fig. 9. Source Current vs. Source-To-Drain Voltage

Fig. 10. Gate Charge

$V_{DS} = 30V$
$I_D = 75A$
$I_G = 10mA$
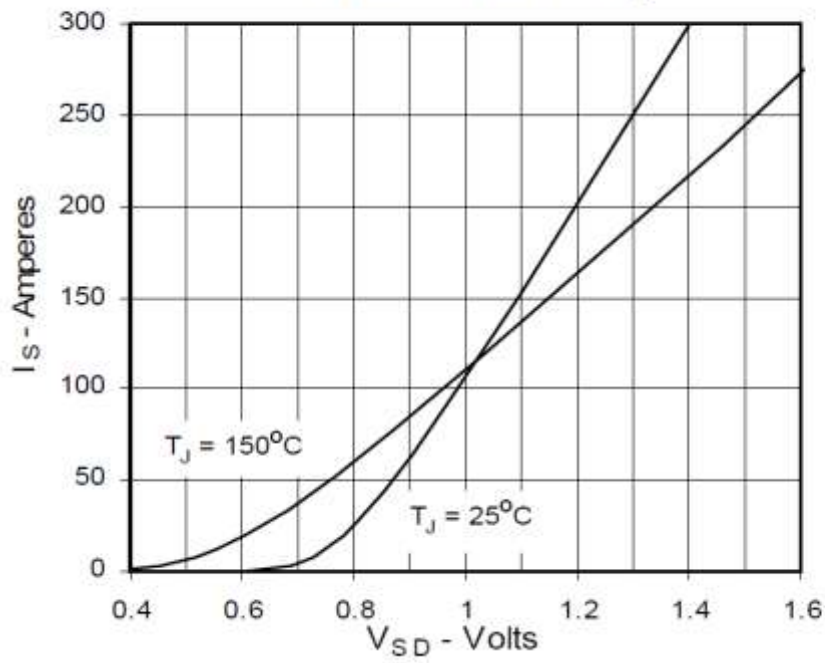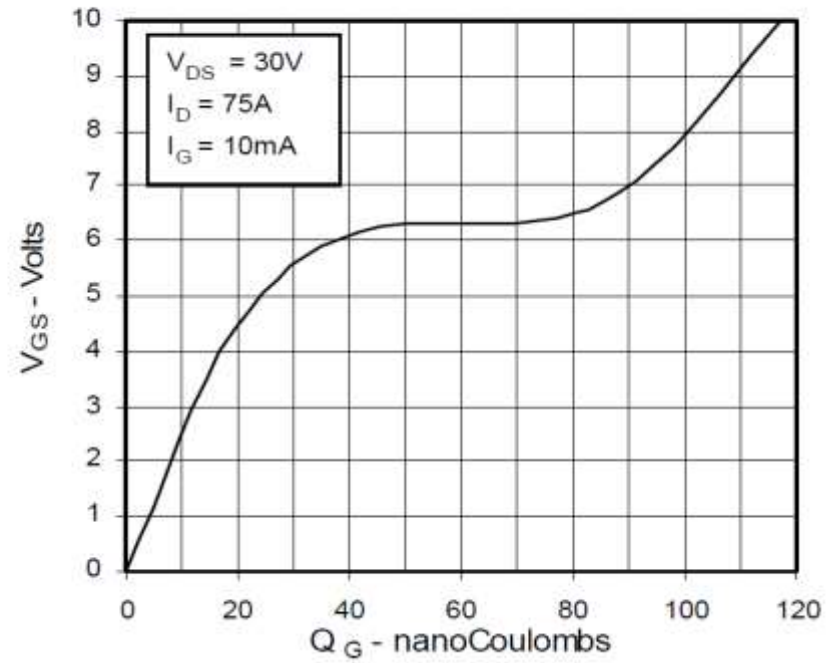
Fig. 11. Capacitance

$f = 1MHz$
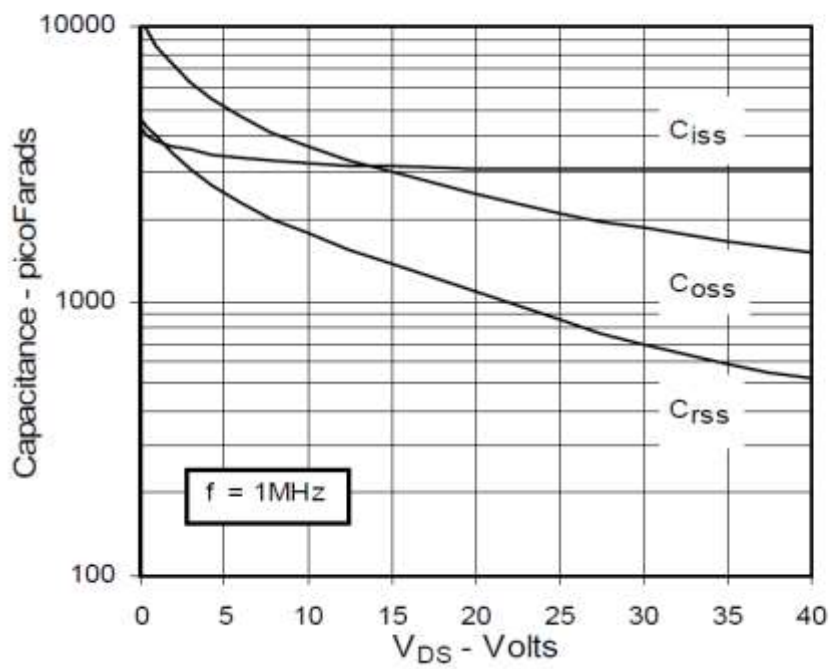
Fig. 12. Forward-Bias Safe Operating Area

$R_{DS(on)}$ Limit

$T_J = 175°C$
$T_C = 25°C$

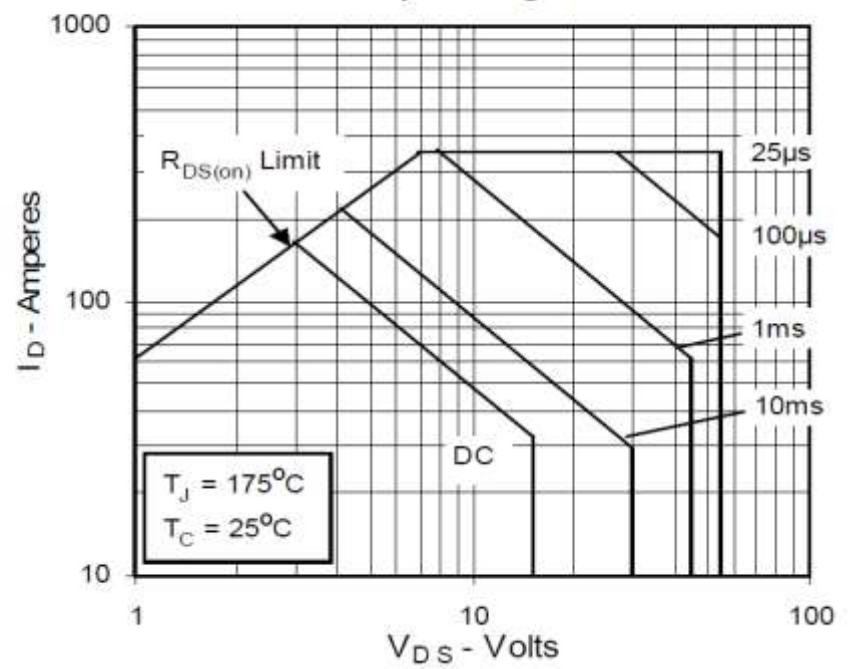## Fig. 13. Maximum Transient Thermal Resistance

印记 Marking:

飞虹LOGO
FEIHONG LOGO

产品代码
PRODUCT CODE

产品型号
PART.NO

生产批次代码
ASSEMMBLY
LOT CODE

档位
GRANDING CODE
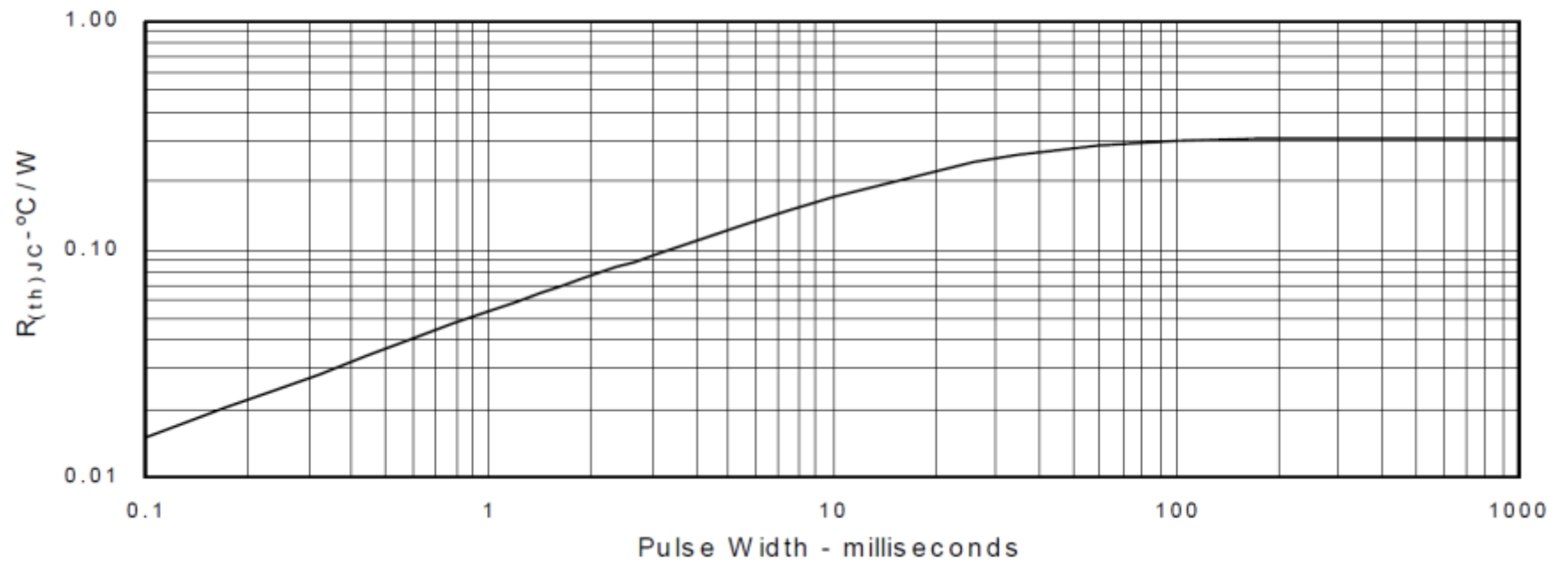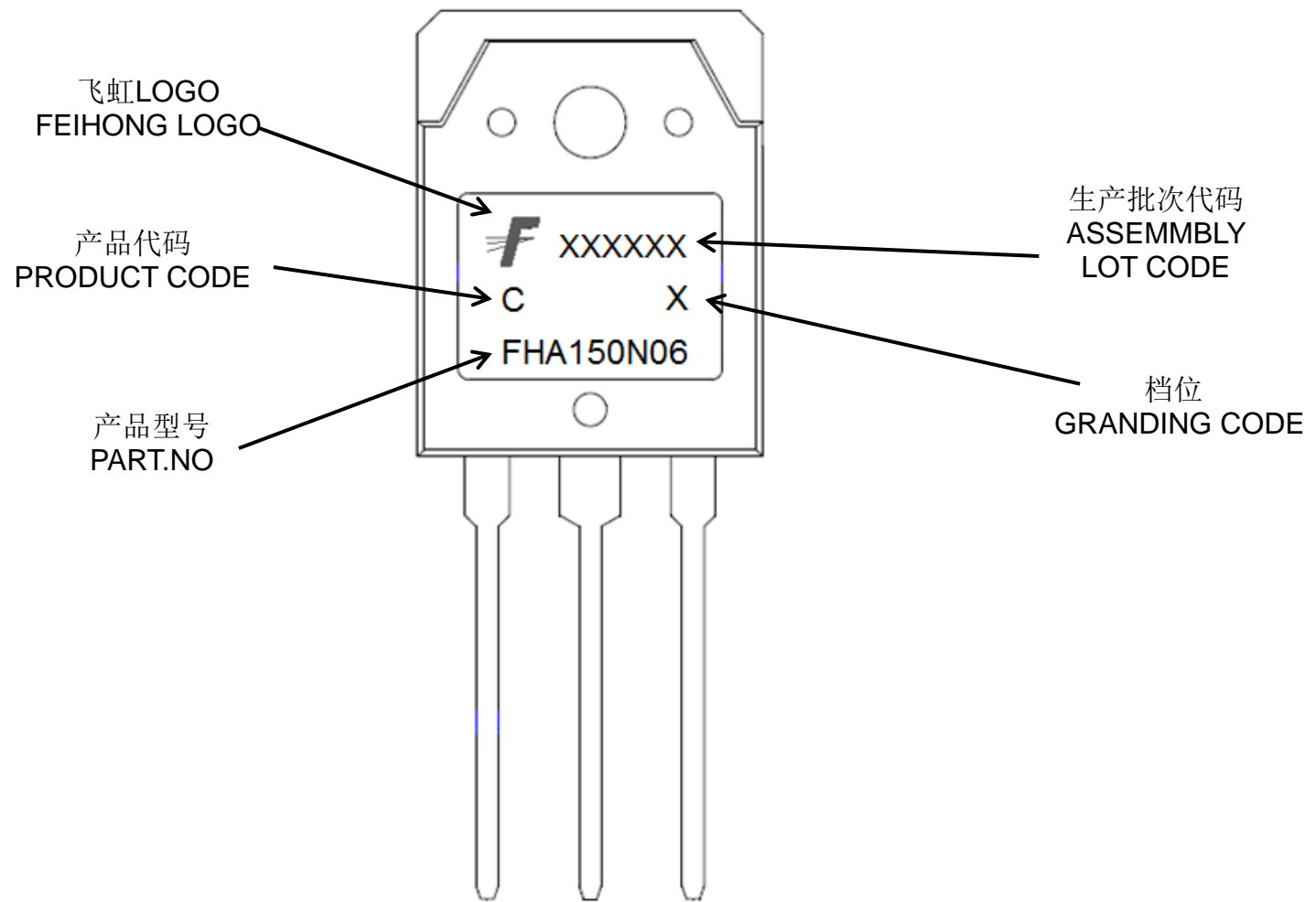
外形尺寸：

Package Dimension：

TO-3PN
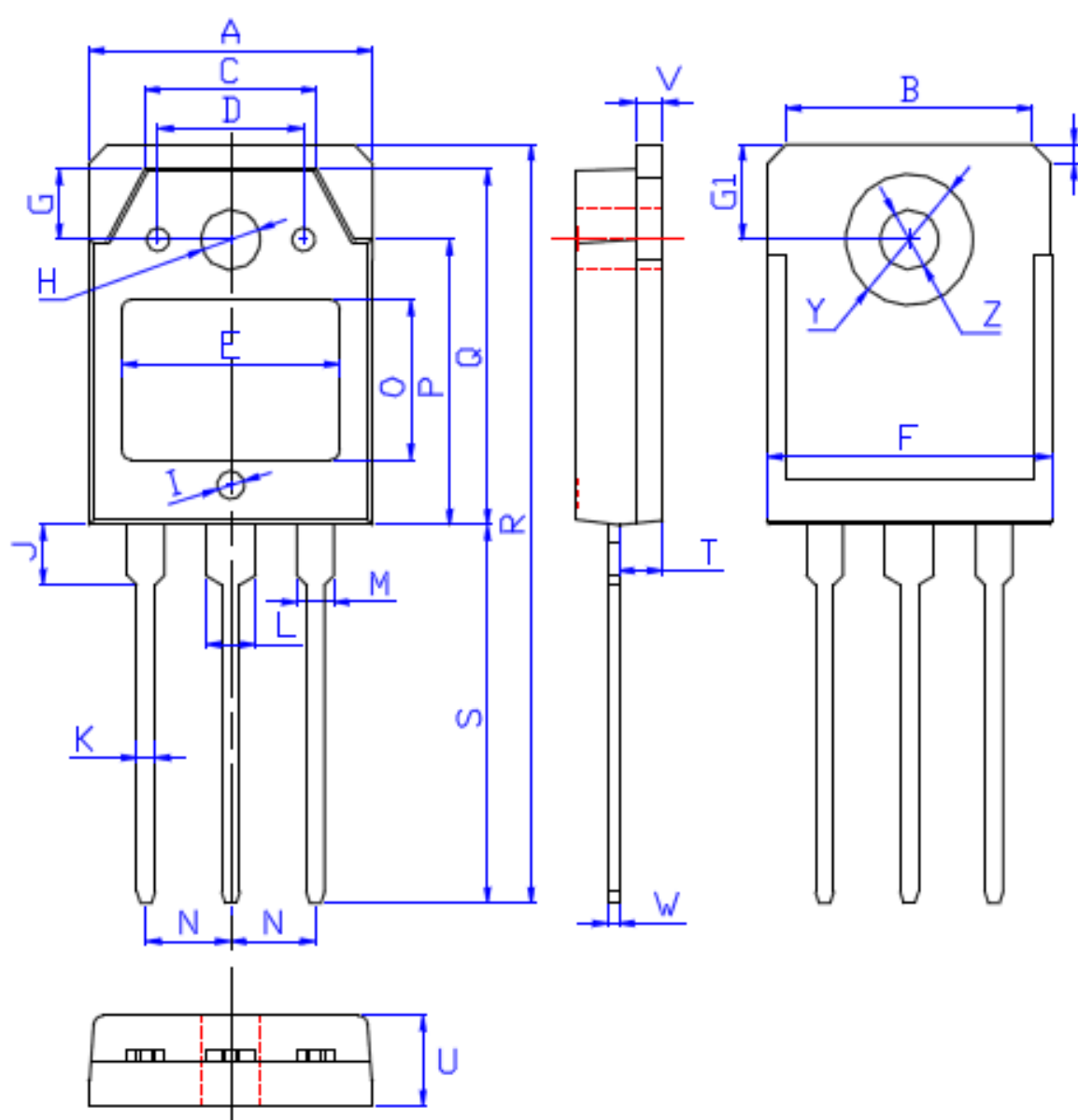
DIM	MILLIMETERS
A	15.60±0.30
B	13.60±0.30
C	9.50±0.30
D	8.00±0.30
E	11.85±0.30
F	15.65±0.30
G	3.80±0.30
G1	5.00±0.30
H	Φ3.50±0.30
I	Φ1.50±0.30 深0.15±0.15
J	3.20±0.30
K	1.00±0.15
L	3.10±0.15
M	2.10±0.15
N	5.45±0.30
O	8.40±0.30
P	13.90±0.30
Q	18.70±0.30
R	40.00±0.60
S	20.00±0.40
T	2.40±0.30
U	4.80±0.30
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

（Unit：mm）

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