



# N 沟道增强型场效应晶体管

## N-CHANNEL MOSFET

### FHA150N06C

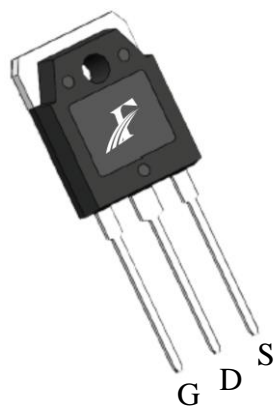
#### 主要参数 MAIN CHARACTERISTICS

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

#### 封装形式 Package

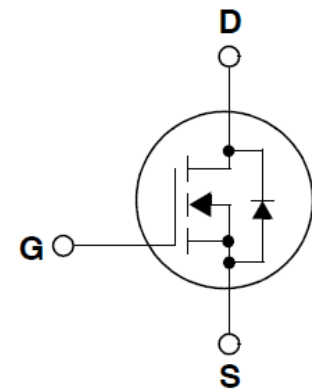


TO-3PN  
FHA series

#### 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

#### 等效电路 Equivalent Circuit



#### 绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项目 Parameter	符号 Symbol	数值 Value	单位 Unit
		FHA150N06C	
最高漏极-源极直流电压 Drain-Source Voltage	VDS	55	V
连续漏极电流* Drain Current -continuous *	ID (Tc=25°C)	150	A
	ID (Tc=100°C)	105	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	IDM	450	A
最高栅源电压 Gate-Source Voltage	VGS	±20	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	EAS	1500	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	IAR	25	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	EAR	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	PD (TC=25°C)	290	W
	-Derate above 25°C	1.69	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	-55~+175	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	TL	300	°C

\*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 <b>Off –Characteristics</b>						
漏-源击穿电压 Drain-Source Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	55	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	I <sub>D</sub> =250μA, referenced to 25°C	-	0.055	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =55V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C	-	-	1	μA
		V <sub>DS</sub> =44V, T <sub>C</sub> =125°C	-	-	100	μA
栅极体漏电流 Gate-body leakage current	I <sub>GSS</sub> (F/R)	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
通态特性 <b>On-Characteristics</b>						
阈值电压 Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.0	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V , I <sub>D</sub> =40A	-	7.2	9	mΩ
正向跨导 Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 20V, I <sub>D</sub> =40A (note 4)	40	-	-	S
动态特性 <b>Dynamic Characteristics</b>						
栅电阻 Gate Resistance	R <sub>g</sub>	f=1.0MHz, V <sub>DS</sub> OPEN	-	1.7	-	Ω
输入电容 Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	3000	-	pF
输出电容 Output capacitance	C <sub>oss</sub>		-	2100	-	
反向传输电容 Reverse transfer capacitance	C <sub>rss</sub>		-	850	-	
开关特性 <b>Switching Characteristics</b>						
延迟时间 Turn-On delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =30V, I <sub>D</sub> =75A, R <sub>G</sub> =4.5Ω V <sub>GS</sub> =10V (note 4, 5)	-	14	-	ns
上升时间 Turn-On rise time	t <sub>r</sub>		-	101	-	ns
延迟时间 Turn-Off delay time	t <sub>d(off)</sub>		-	50	-	ns
下降时间 Turn-Off Fall time	t <sub>f</sub>		-	65	-	ns
栅极电荷总量 Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V , I <sub>D</sub> =75A , V <sub>GS</sub> =10V (note 4, 5)	-	118	-	nC
栅-源电荷 Gate-Source charge	Q <sub>gs</sub>		-	30	-	nC
栅-漏电荷 Gate-Drain charge	Q <sub>gd</sub>		-	55	-	nC
漏-源二极管特性及最大额定值 <b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current		I <sub>S</sub>	-	-	150	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	450	A
正向压降 Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =62A	-	0.9	1.3	V
反向恢复时间 Reverse recovery time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =62A ,dI <sub>F</sub> /dt=100A/μs (note 4)	-	69	-	ns
反向恢复电荷 Reverse recovery charge	Q <sub>rr</sub>		-	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	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	40	°C/W

注释:

- 1: 脉冲宽度由最高结温限制
- 2: L=1mH, IAS=25A, VDD=44V, RG=25 Ω, 起始结温 TJ=25°C
- 3: ISD ≤150A, di/dt ≤300A/μs, VDD≤BVDS, 起始结温 TJ=25°C
- 4: 脉冲测试: 脉冲宽度 ≤300μs, 占空比≤2%
- 5: 基本与工作温度无关

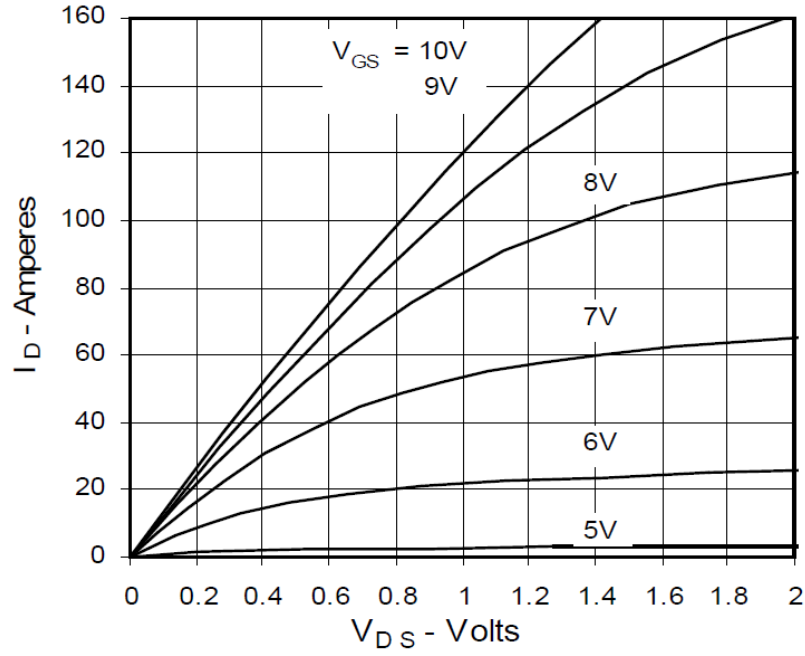
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: L=1mH, IAS=25A, VDD=44V, RG=25 Ω, Starting TJ=25°C
- 3: ISD ≤150A, di/dt ≤300A/μs, VDD≤BVDS, Starting TJ=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%
- 5: Essentially independent of operating temperatur

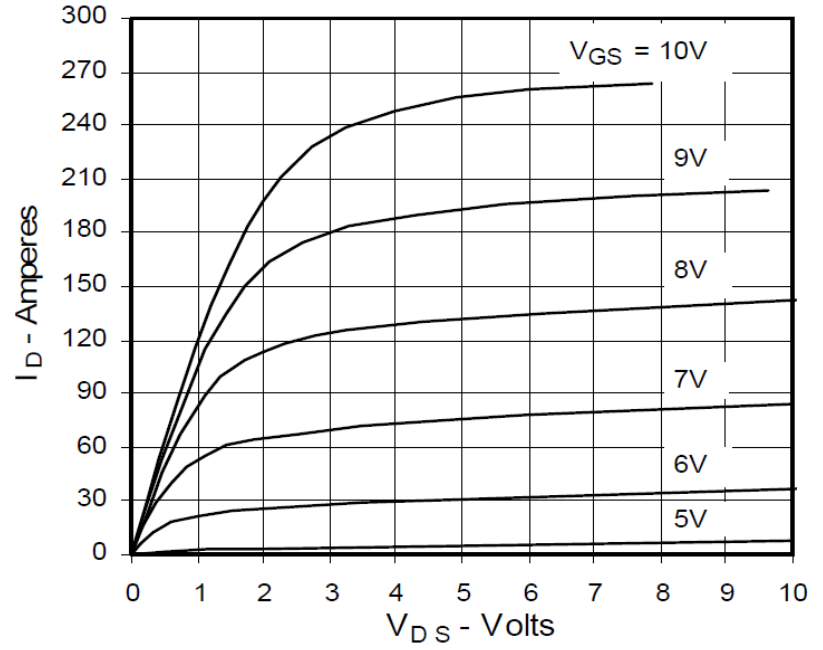
# 特性曲线

## Typical Characteristics

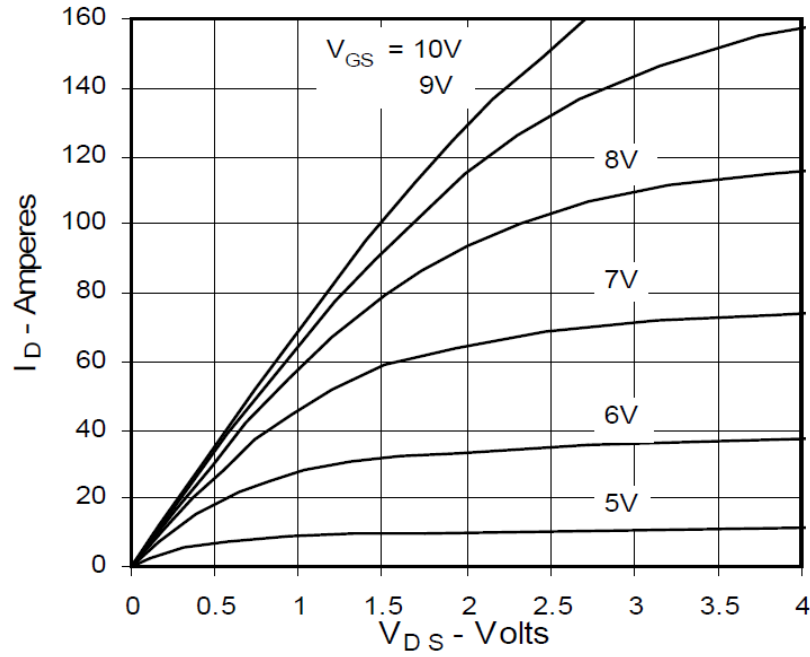
**Fig. 1. Output Characteristics @ 25°C**



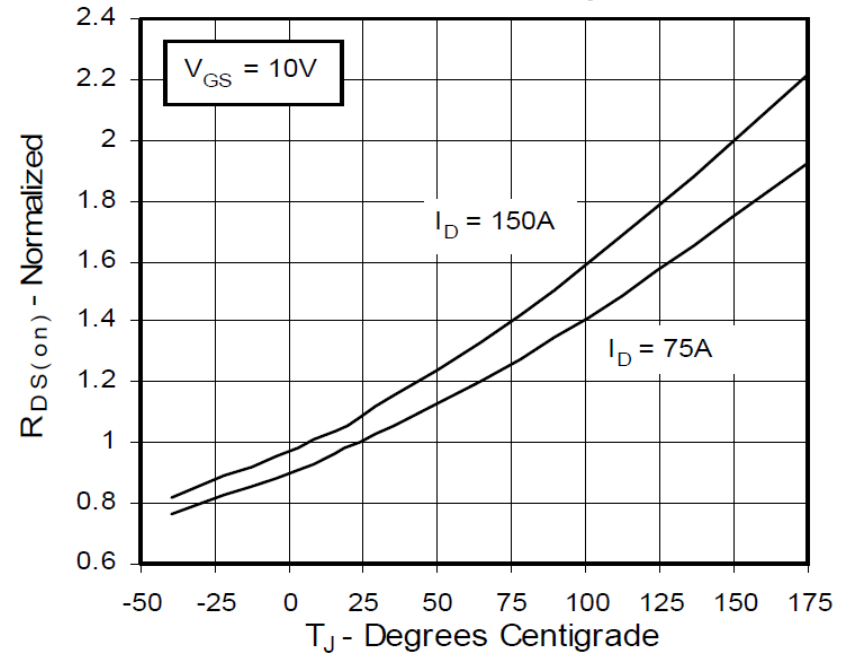
**Fig. 2. Extended Output Characteristics @ 25°C**



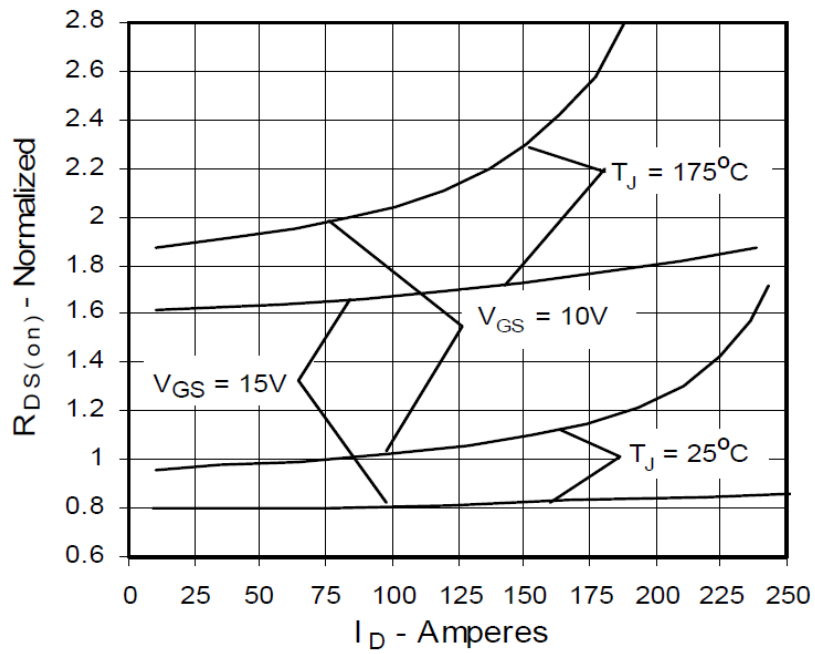
**Fig. 3. Output Characteristics @ 150°C**



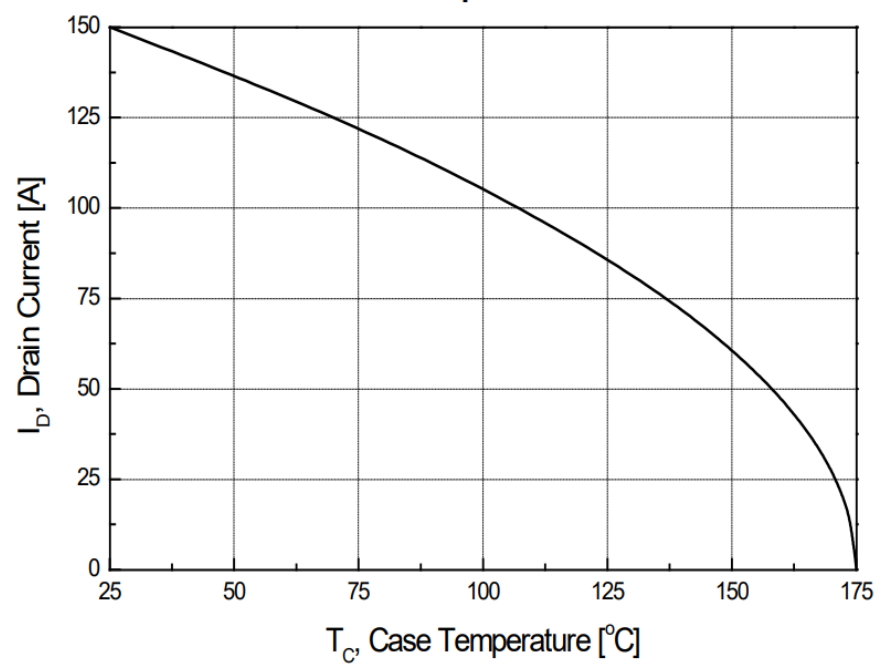
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



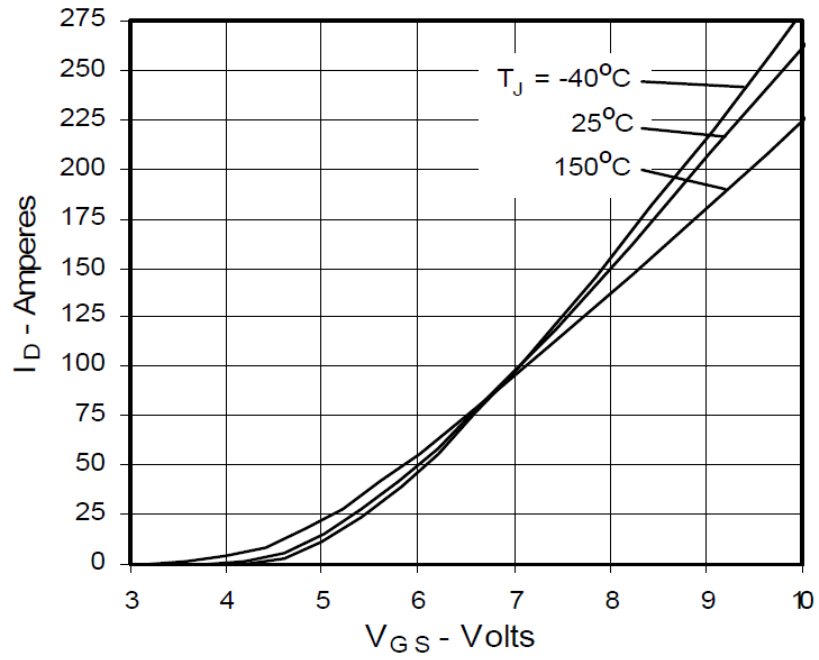
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Drain Current**



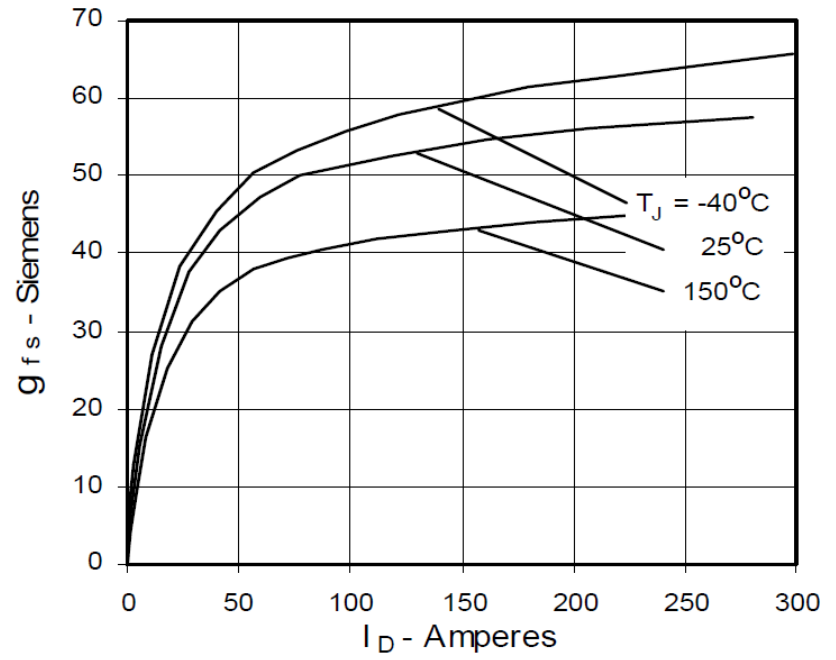
**Fig. 6. Drain Current vs. Case Temperature**



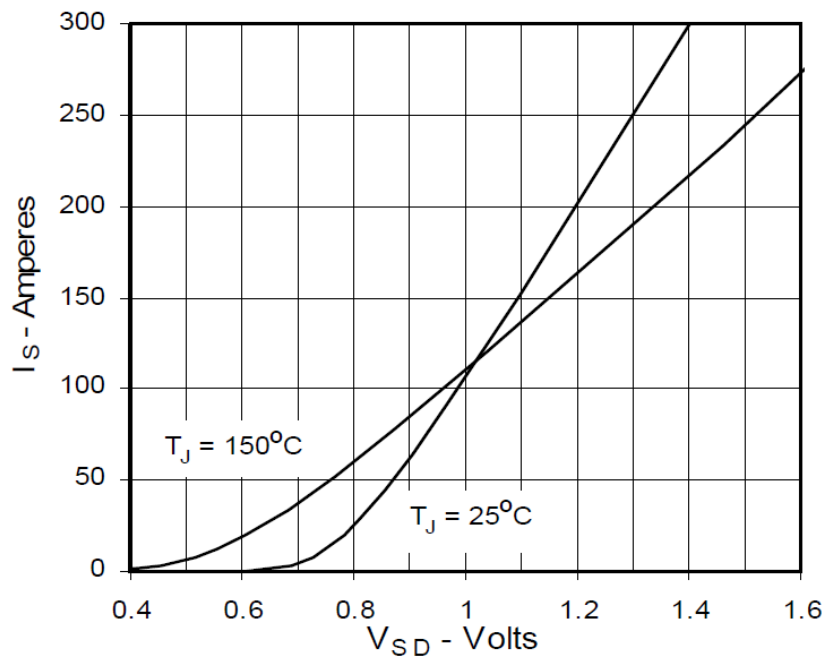
**Fig. 7. Input Admittance**



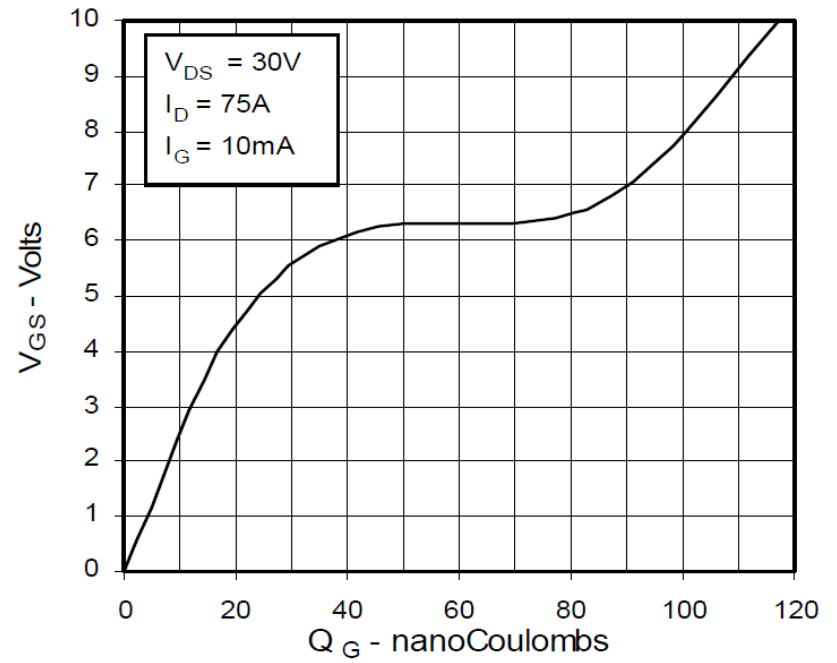
**Fig. 8. Transconductance**



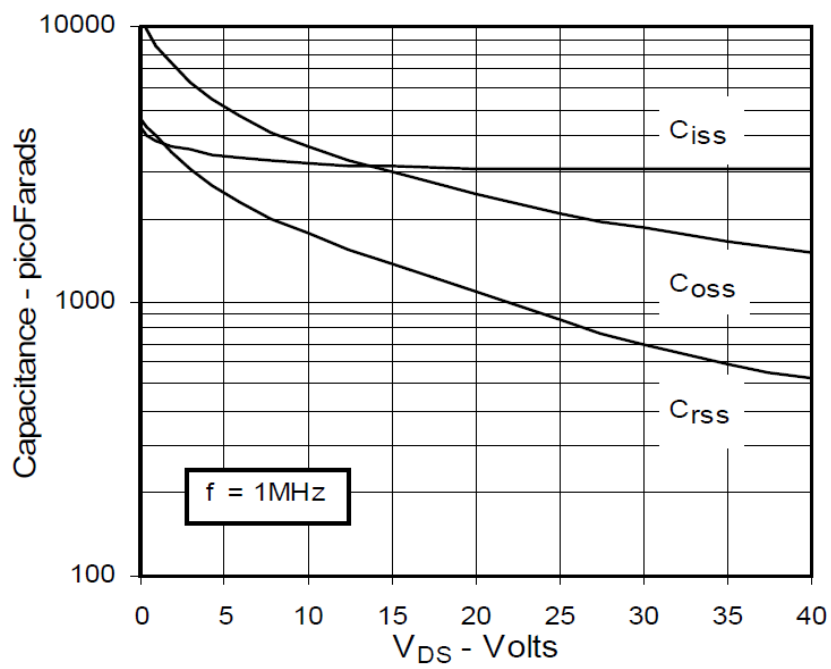
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**

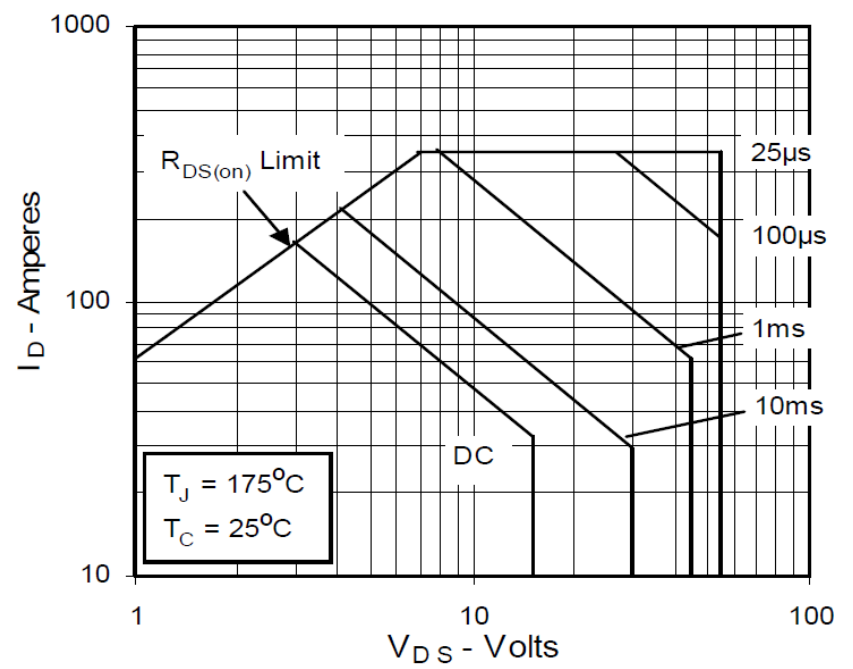
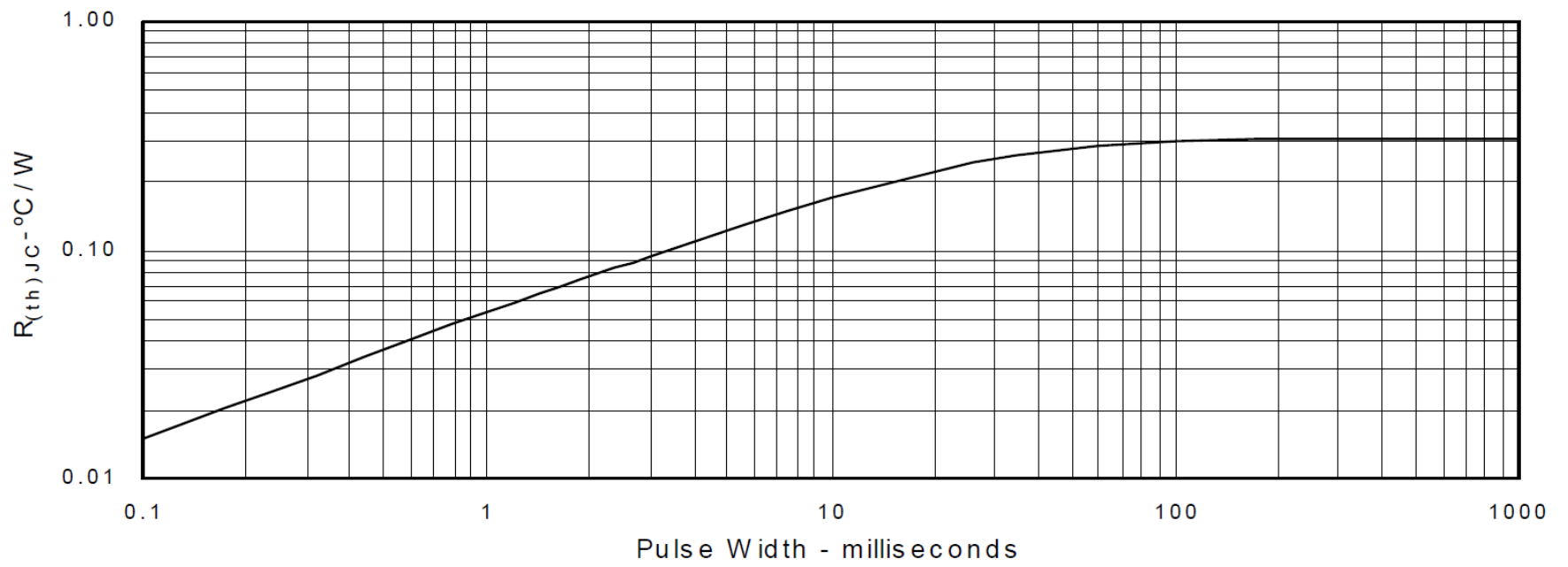
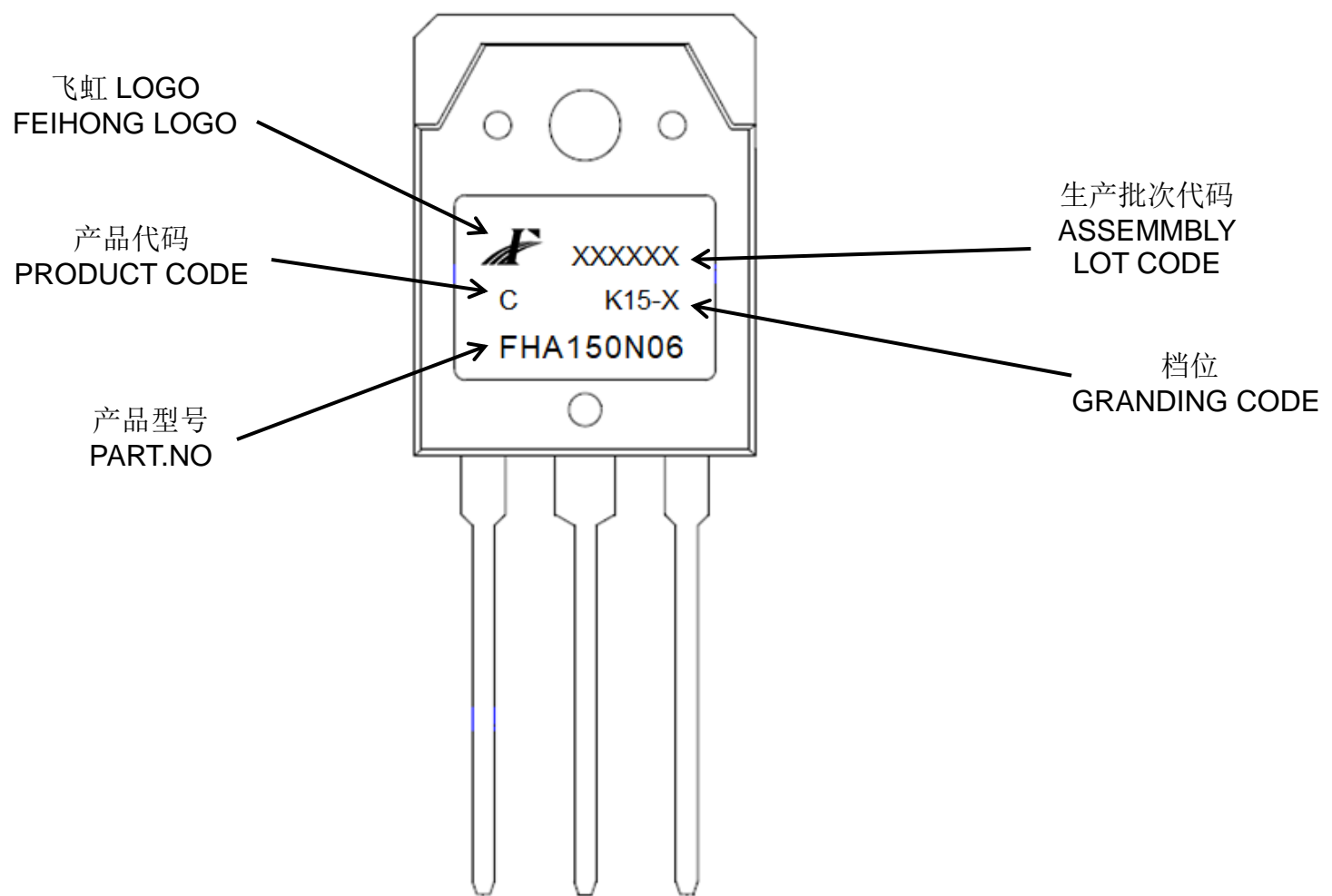


Fig. 13. Maximum Transient Thermal Resistance



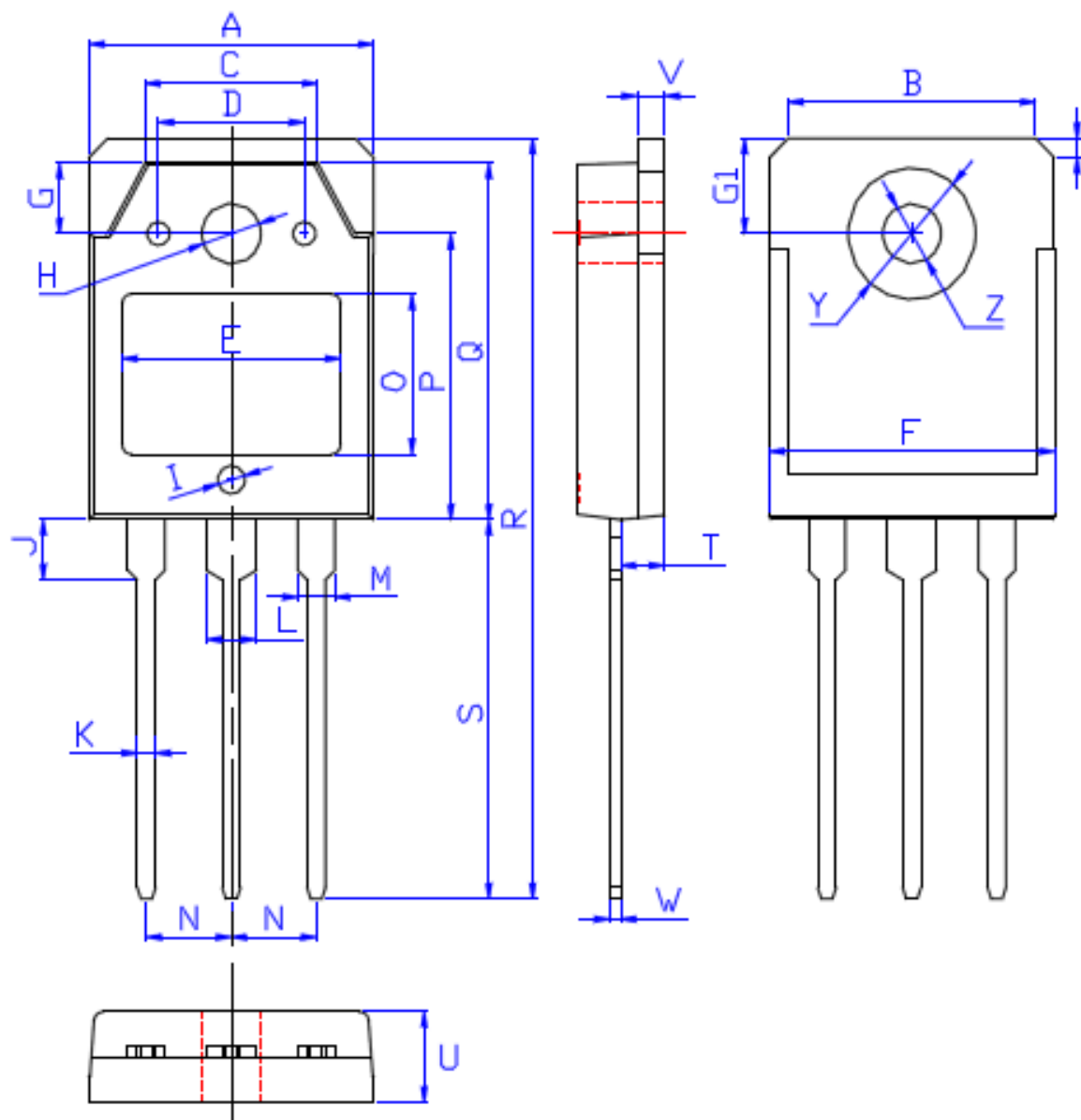
印记 Marking:



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)