



N 沟道增强型场效应晶体管

N-CHANNEL MOSFET

FHT5N60D

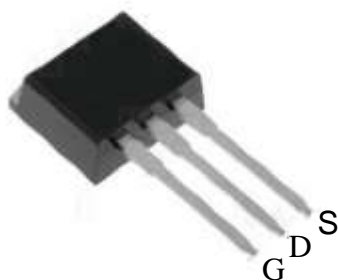
**主要参数 MAIN CHARACTERISTICS**

ID	5A
VDSS	600V
Rdson-typ ( @Vgs=10V)	1.7Ω
Qg-typ	13.3nC

**用途 APPLICATIONS**

高频开关电源	High efficiency switch mode power supplies
电子镇流器	Electronic ballast
LED 电源	LED power supply

**封装形式 Package**

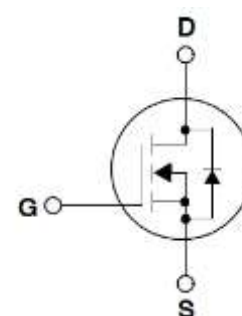


TO-262  
FHT 系列

**产品特性 FEATURES**

低栅极电荷	Low gate charge
低 Crss (典型值 17pF)	Low Crss (typical 17pF)
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

**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
		FHT5N60D	
最高漏极-源极直流电压 Drain-Source Voltage	VDS	600	V
连续漏极电流* Drain Current -continuous *	ID (Tc=25°C)	5	A
	ID (Tc=100°C)	3.1	A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	IDM	20	A
最高栅源电压 Gate-Source Voltage	VGS	±30	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	EAS	128	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	IAR	1.9	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	EAR	4.4	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)	75	W
	-Derate above 25°C	0.6	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	150, -55 to 150	°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
<b>关态特性 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	600	-	-	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	-	0.66	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C	-	-	10	μA
		V <sub>DS</sub> =480V, 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> =±30V	-	-	±100	μA
<b>通态特性 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	-	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> =2.5A	-	1.7	2.1	Ω
正向跨导 Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> =2.5A (note 4)	-	2.5	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	560	-	pF
输出电容 Output capacitance	C <sub>oss</sub>		-	45	-	
反向传输电容 Reverse transfer capacitance	C <sub>rss</sub>		-	17	-	
<b>开关特性 Switching Characteristics</b>						
延迟时间 Turn-On delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =300V, I <sub>D</sub> =5A, R <sub>G</sub> =25Ω V <sub>GS</sub> =10V (note 4, 5)	-	64	-	ns
上升时间 Turn-On rise time	t <sub>r</sub>		-	24	-	ns
延迟时间 Turn-Off delay time	t <sub>d(off)</sub>		-	28	-	ns
下降时间 Turn-Off Fall time	t <sub>f</sub>		-	200	-	ns
栅极电荷总量 Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V , I <sub>D</sub> =2.5A , V <sub>GS</sub> =10V (note 4, 5)	-	13.3	-	nC
栅-源电荷 Gate-Source charge	Q <sub>gs</sub>		-	3.0	-	nC
栅-漏电荷 Gate-Drain charge	Q <sub>gd</sub>		-	4.8	-	nC
<b>漏-源二极管特性及最大额定值 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>	-	-	5	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	20	A
正向压降 Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =2A	-	-	1.4	V
反向恢复时间 Reverse recovery time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =2A , dI <sub>F</sub> /dt=100A/μs (note 4)	-	390	-	ns
反向恢复电荷 Reverse recovery charge	Q <sub>rr</sub>		-	1.85	-	uC

## 热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	FHT5N60D	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	1.25	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	°C/W

注释:

Notes:

- 1: 脉冲宽度由最高结温限制
- 2: L=25mH, IAS=4A, VDD=48V, RG=25 Ω, 起始结温 TJ=25°C
- 3: ISD ≤4A, di/dt ≤100A/μs, VDD≤BVDSS, 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

- 1: Pulse width limited by maximum junction temperature
- 2: L=25mH, ID=4A, VDD=48V, RG=25 Ω, Start TJ=25°C;
- 3: ISD ≤4A, di/dt ≤100A/μs, VDD≤BV<sub>DSS</sub>, Starting TJ=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%
- 5: Essentially independent of operating temperatur

# 特性曲线

## (ELECTRICAL CHARACTERISTICS (curves))

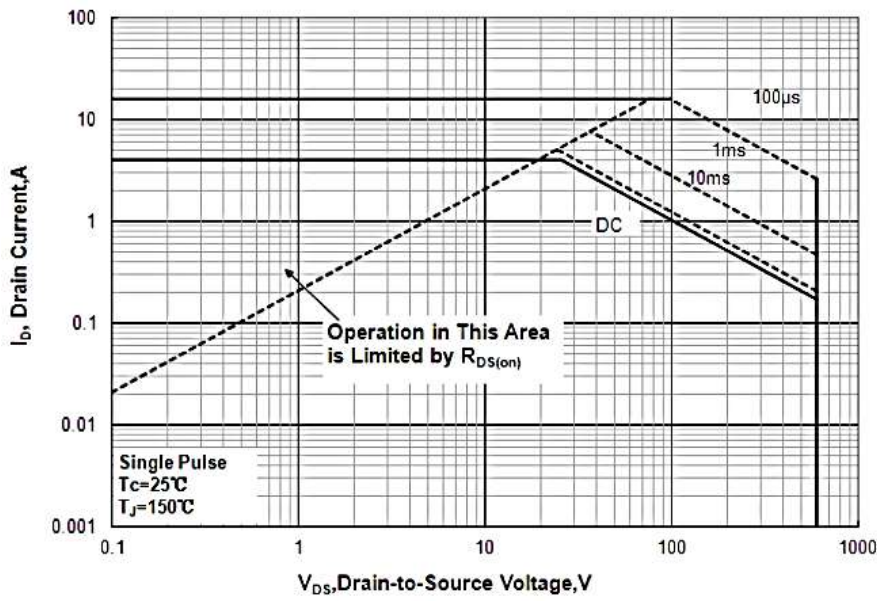


Figure 1 Maximum Forward Bias Safe Operating Area

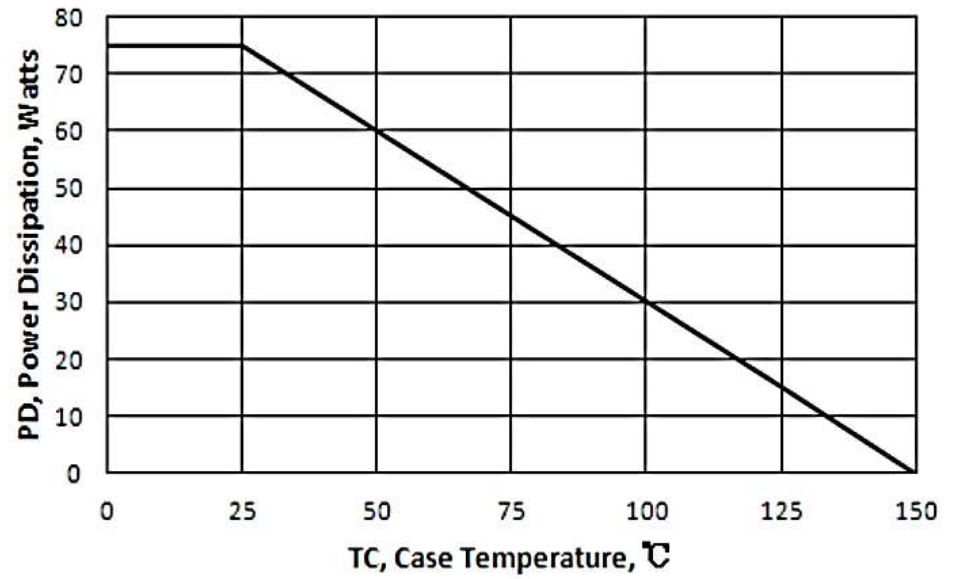


Figure 2 Maximum Power Dissipation vs Case Temperature

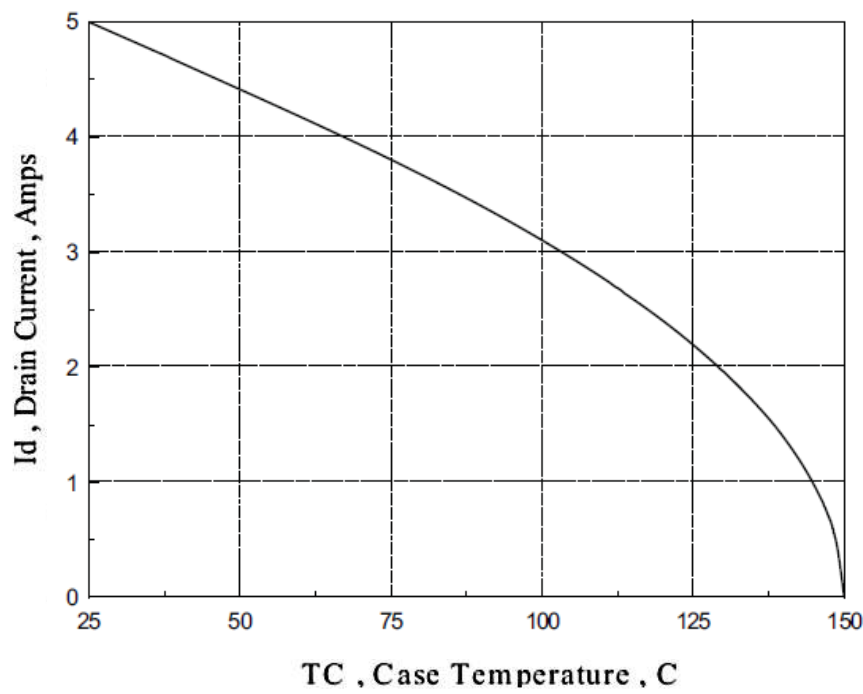


Figure 3 Maximum Continuous Drain Current vs Case Temperature

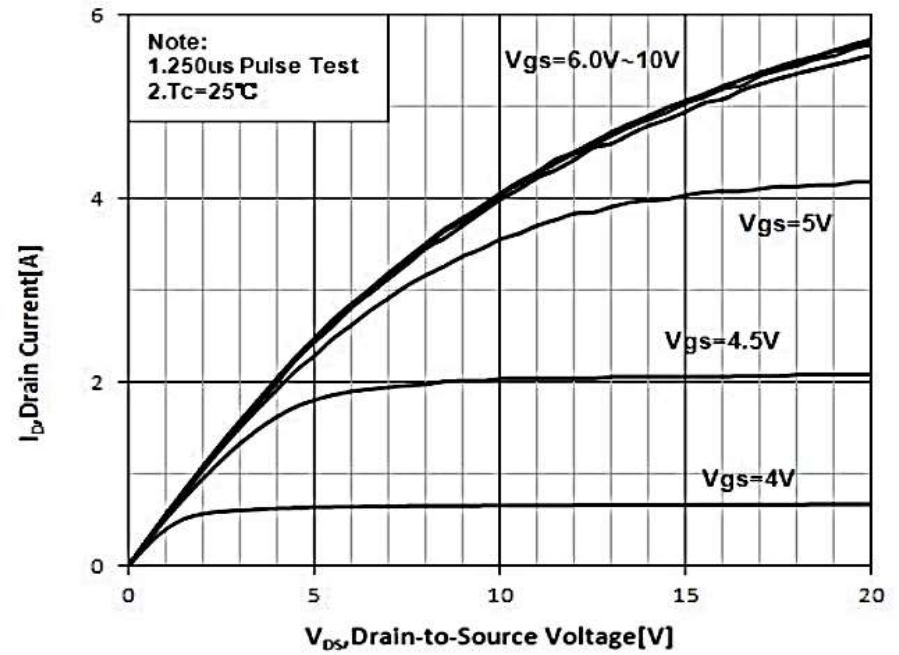


Figure 4 Typical Output Characteristics

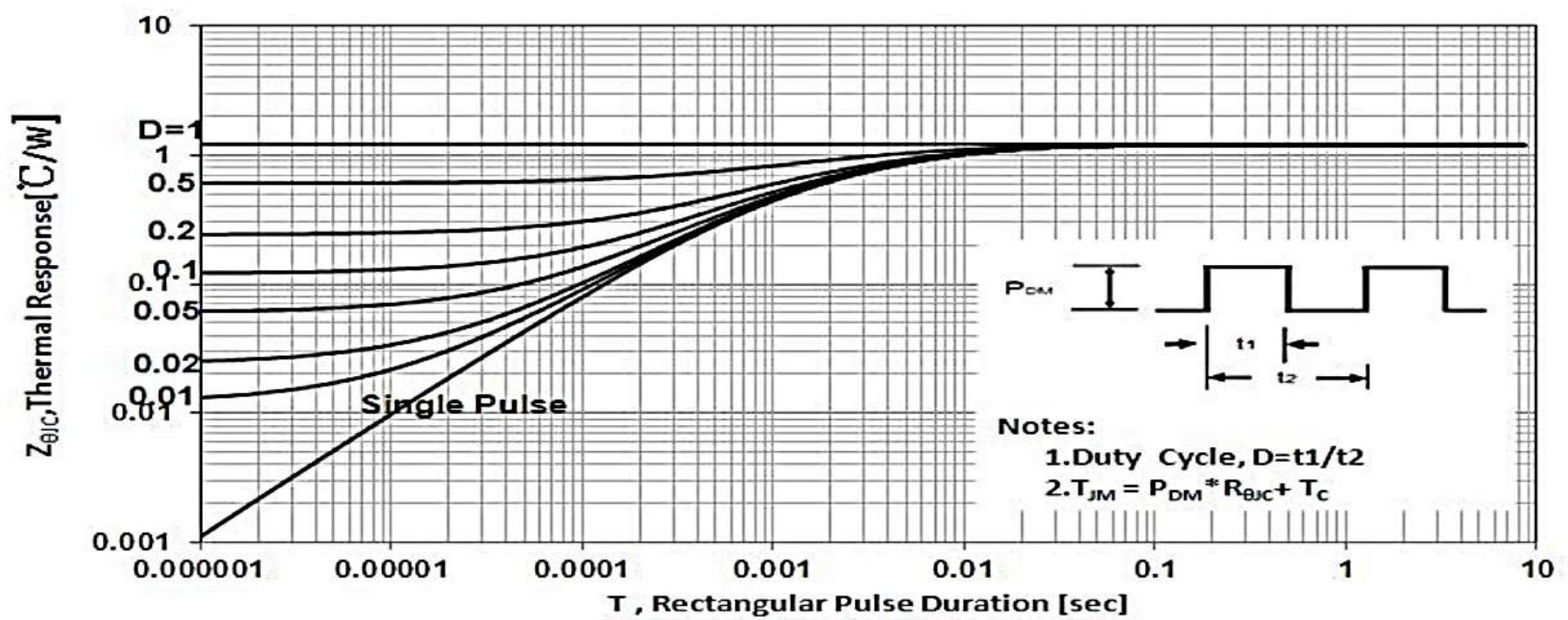


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

# 特性曲线 (ELECTRICAL CHARACTERISTICS (curves))

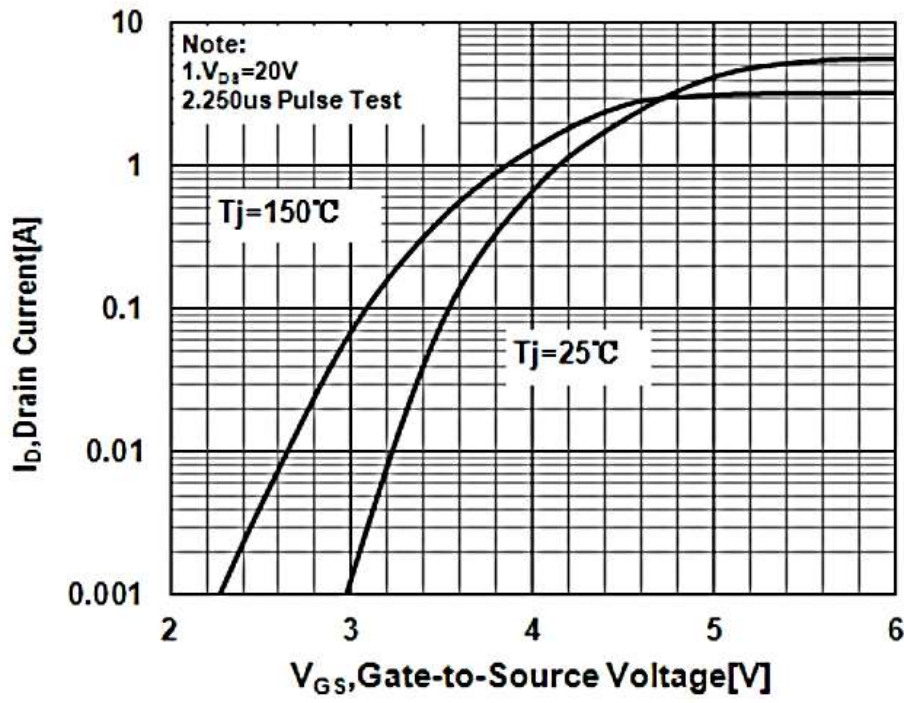


Figure 6 Typical Transfer Characteristics

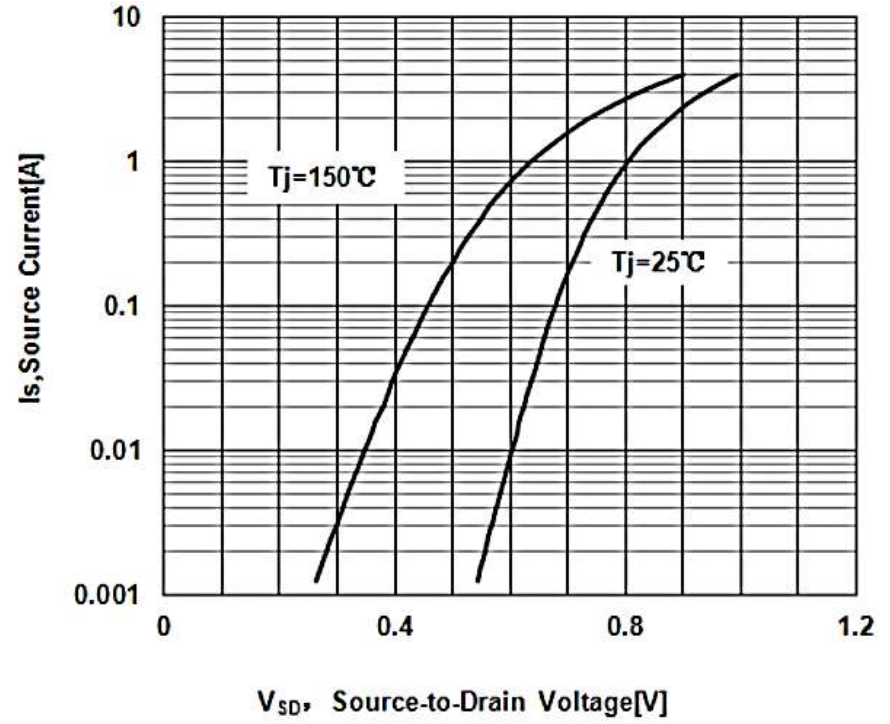


Figure 7 Typical Body Diode Transfer Characteristics

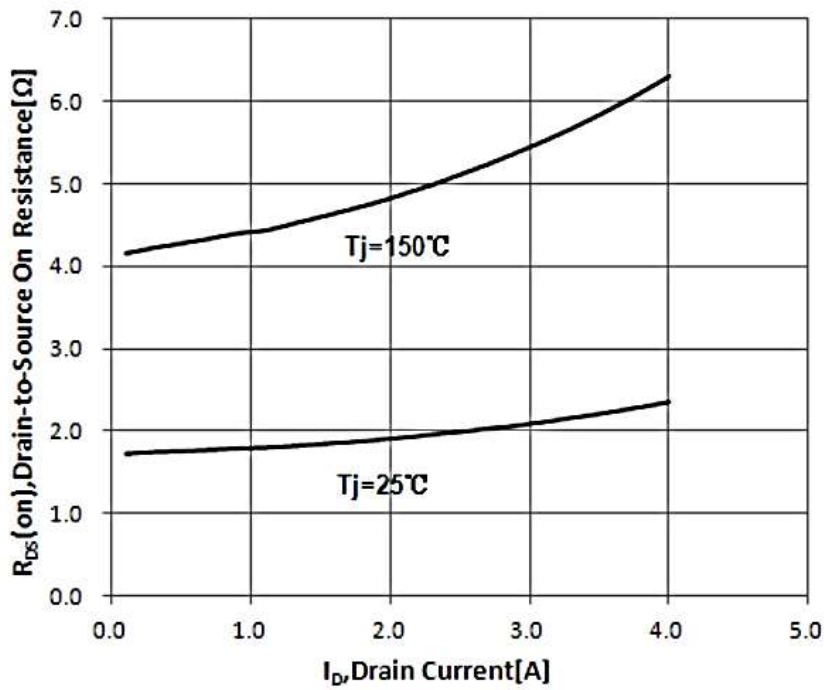


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

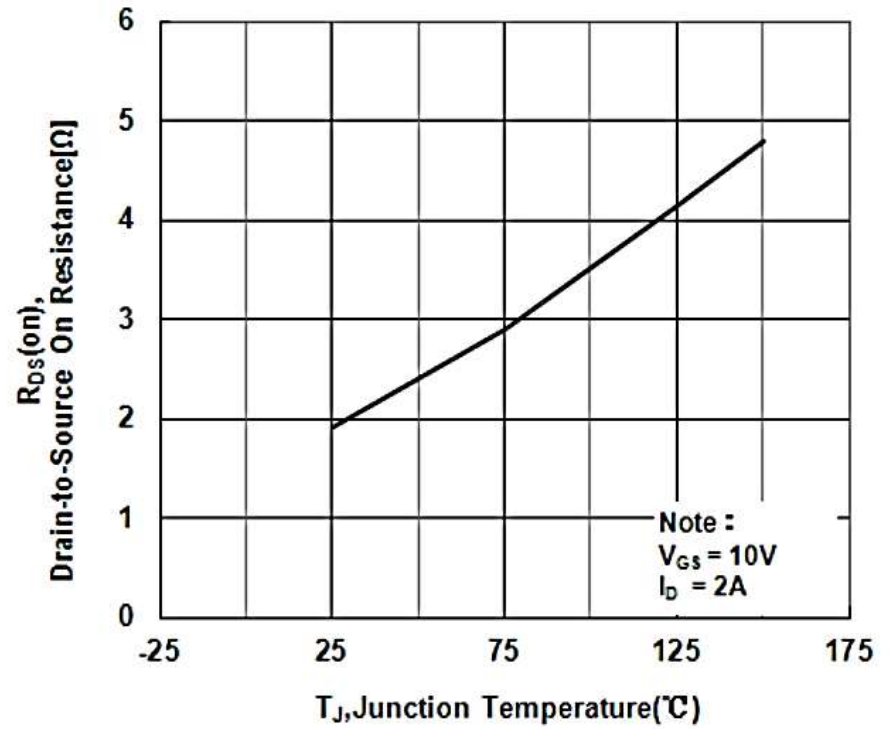


Figure 9 Typical Drain to Source on Resistance vs Junction Temperature

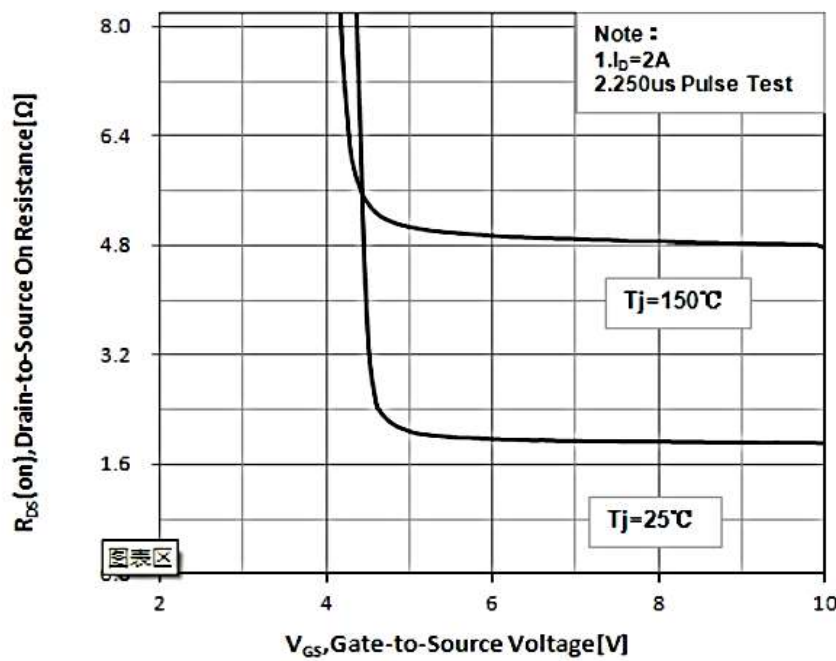


Figure 10 Drain to Source ON Resistance vs Gate-to-Source Voltage

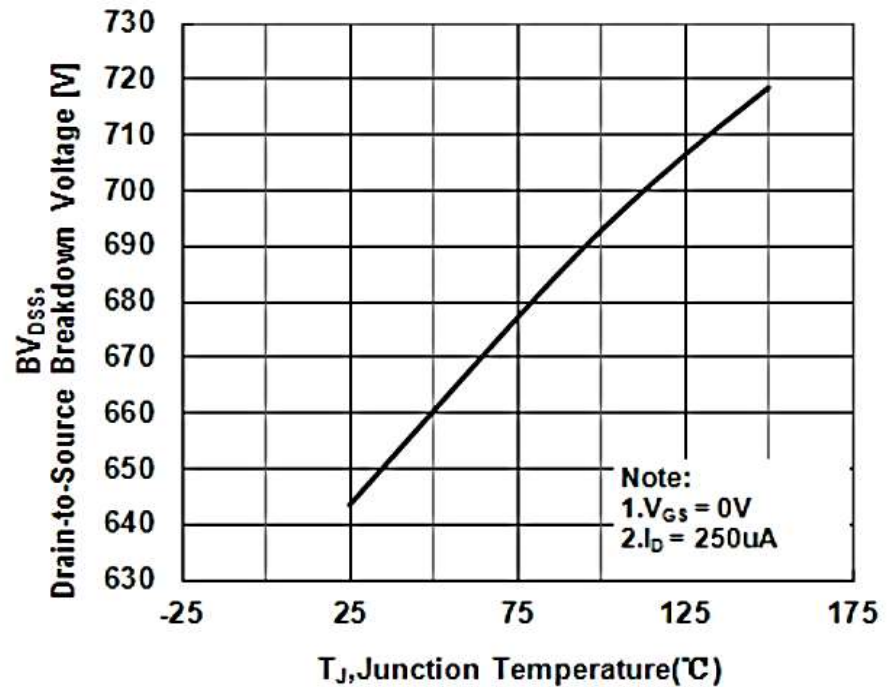


Figure 11 Typical Breakdown Voltage vs Junction Temperature

# 特性曲线 (ELECTRICAL CHARACTERISTICS (curves))

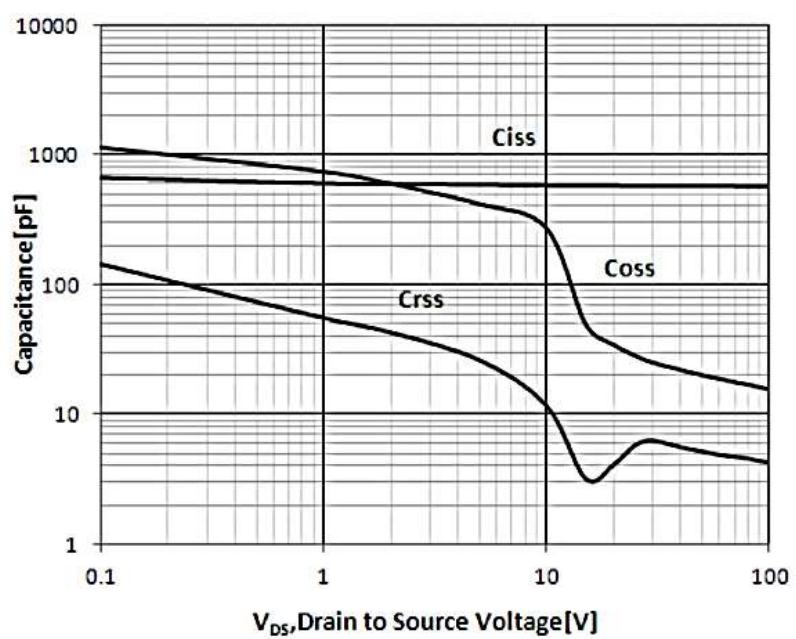


Figure 12 Typical Capacitance vs Drain to Source Voltage

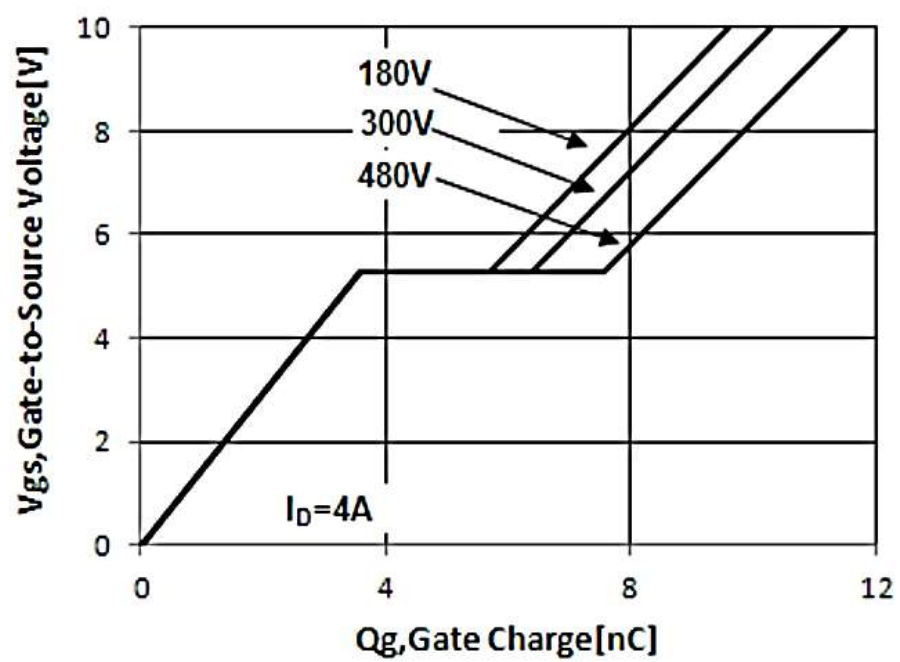
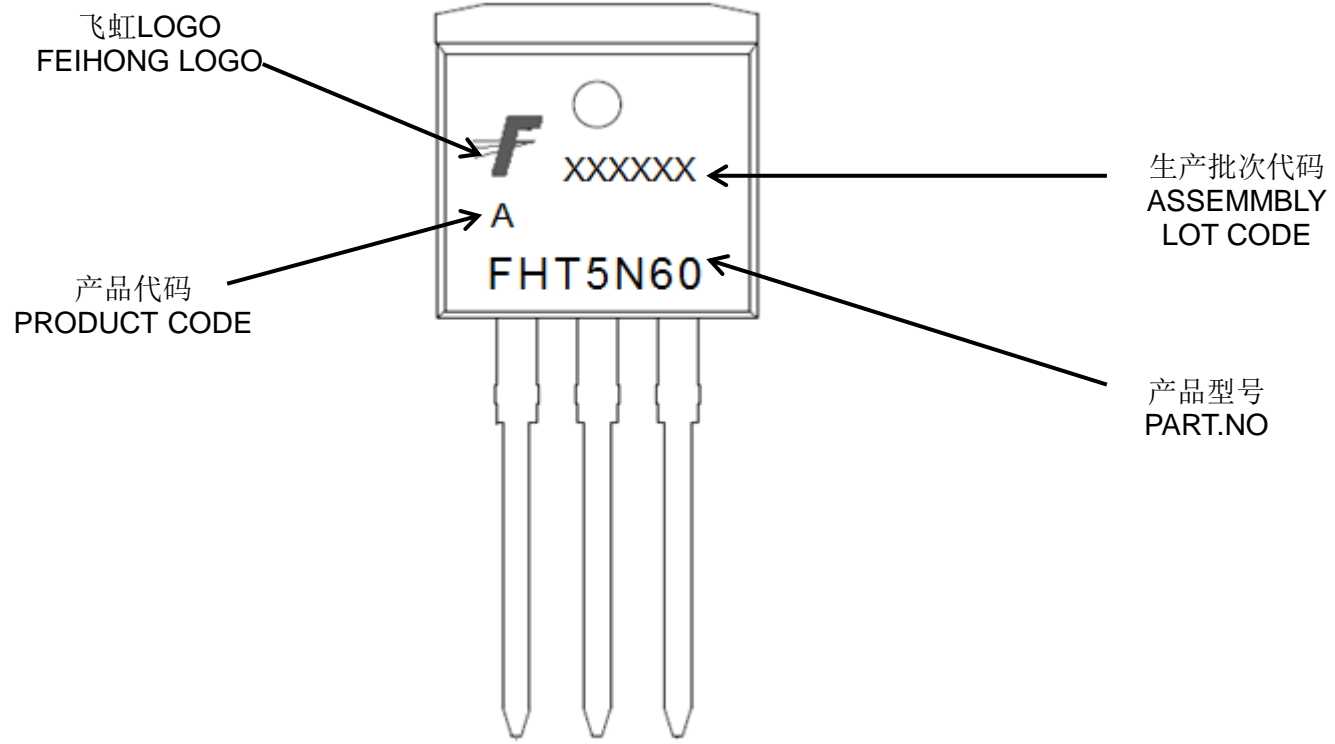


Figure 13 Typical Gate Charge vs Gate to Source Voltage

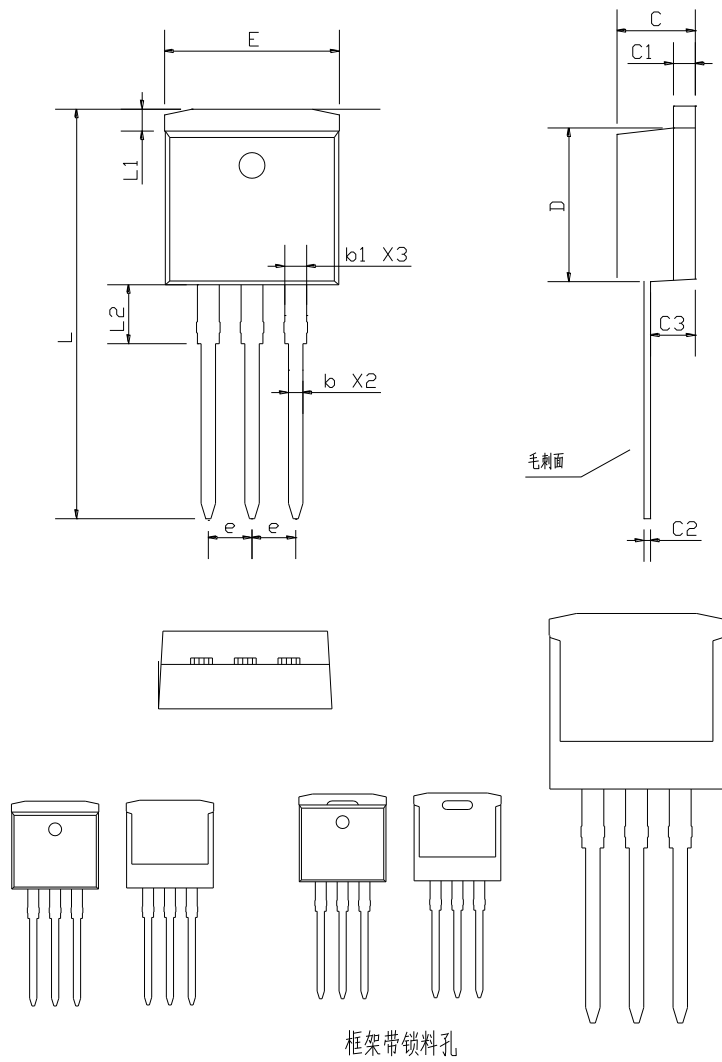
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印记 Marking:



外形尺寸：  
Package Dimension:

TO-262



DIM	MILLIMETERS	
	MIN	MAX
E	9.80	10.50
L	23.35	24.20
L1	1.00	1.55
L2	3.05	3.85
b	0.60	0.99
b1	1.00	1.50
C	4.30	4.80
C1	1.10	1.45
C2	0.25	0.52
C3	2.40	2.80
D	8.50	9.50
e	Typical	2.54

(Units: mm)