

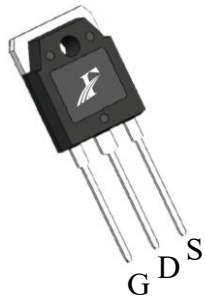
#### 主要参数 MAIN CHARACTERISTICS

ID	300 A
VDSS	85 V
Rdson-typ ( @Vgs=10V )	1.8 mΩ
Qg-typ	170 nC

#### 用途 APPLICATIONS

高频开关电源	High efficiency switch mode power supplies
逆变器	Power Management in Inverter System
直流转换器	DC-DC Converters
电机驱动	Motor Drive

#### 封装形式 Package

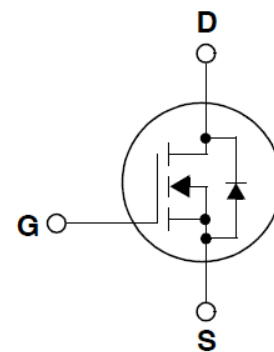


TO-3PN  
FHA series

#### 产品特性 FEATURES

低栅极电荷	Low gate charge
低 Crss (典型值 100 pF)	Low Crss (typical 100 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
RoHS 产品	RoHS product
SGT 工艺	SGT 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
		FHA300N8F2A	
最高漏极-源极直流电压 Drain-Source Voltage	VDSS	85	V
连续漏极电流* Drain Current -continuous *	ID (Tc=25°C)	300	A
	ID (Tc=100°C)	208	A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	IDM	1200	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	722	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	IAR	38	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	EAR	32	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)	400	W
	-Derate above 25°C	2.67	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	175, -55~+150	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	TL	260	°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	85	-	-	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	-	0.1	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =85V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C	-	-	1	μA
		V <sub>DS</sub> =68V, 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
<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> =50A	-	1.8	2.3	mΩ
正向跨导 Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> =50A (note 4)	-	100	-	S
<b>动态特性 Dynamic Characteristics</b>						
栅电阻 Gate Resistance	R <sub>g</sub>	f=1.0MHz, V <sub>DS</sub> OPEN	-	1.3	-	Ω
输入电容 Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1.0MHz	-	15500	-	pF
输出电容 Output capacitance	C <sub>oss</sub>		-	2040	-	
反向传输电容 Reverse transfer capacitance	C <sub>rss</sub>		-	100	-	
<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> =50V, I <sub>D</sub> =50A, R <sub>G</sub> =3Ω V <sub>GS</sub> =10V (note 4, 5)	-	30	-	ns
上升时间 Turn-On rise time	t <sub>r</sub>		-	85	-	ns
延迟时间 Turn-Off delay time	t <sub>d(off)</sub>		-	95	-	ns
下降时间 Turn-Off Fall time	t <sub>f</sub>		-	38	-	ns
栅极电荷总量 Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V , I <sub>D</sub> =50A , V <sub>GS</sub> =10V (note 4, 5)	-	170	-	nC
栅-源电荷 Gate-Source charge	Q <sub>gs</sub>		-	72	-	nC
栅-漏电荷 Gate-Drain charge	Q <sub>gd</sub>		-	35	-	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>	-	-	300	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	1200	A
正向压降 Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =50A	-	-	1.2	V
反向恢复时间 Reverse recovery time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =50A , dI <sub>F</sub> /dt=100A/μs (note 4)	-	135	-	ns
反向恢复电荷 Reverse recovery charge	Q <sub>rr</sub>		-	380	-	nC

## 热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	FHA300N8F2A	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.38	°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=1.0mH, VGS=10V, VDD=48V, RG=25 Ω, 起始结温 TJ=25°C
- 3: ISD ≤300A, 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=1.0mH, VGS=10V, VDD=48V, RG=25 Ω, Starting TJ=25°C
- 3: ISD ≤300A, di/dt ≤300A/μs, VDD ≤BVDS, Starting TJ=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%
- 5: Essentially independent of operating temperature

## Typical Characteristics

### 典型特性曲线

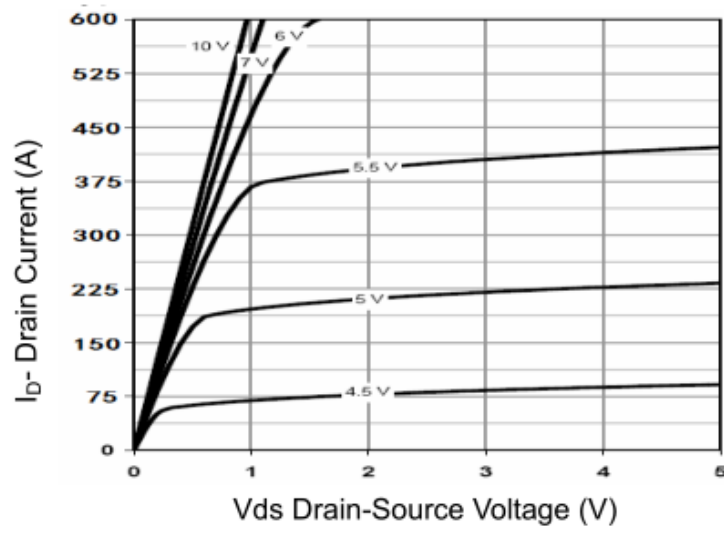


Figure 1 Output Characteristics

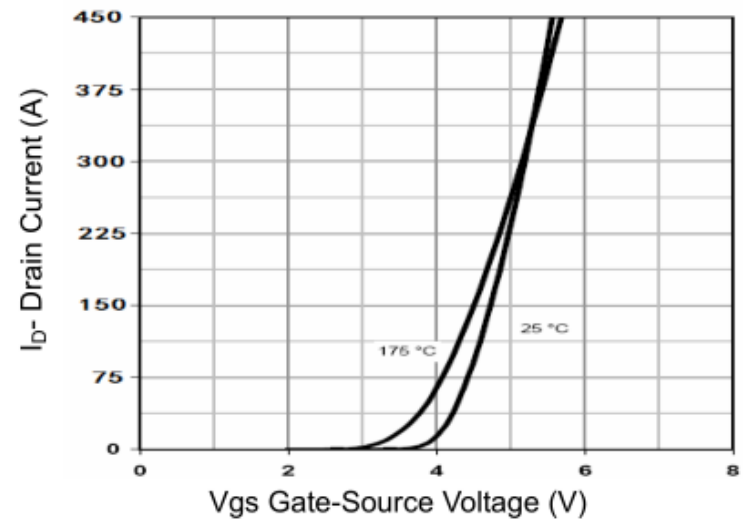


Figure 2 Transfer Characteristics

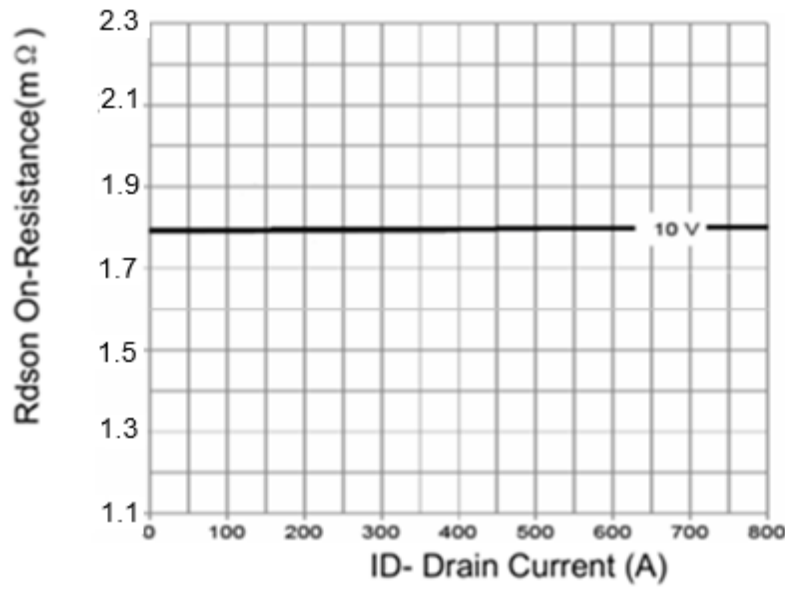


Figure 3 Rdson- Drain Current

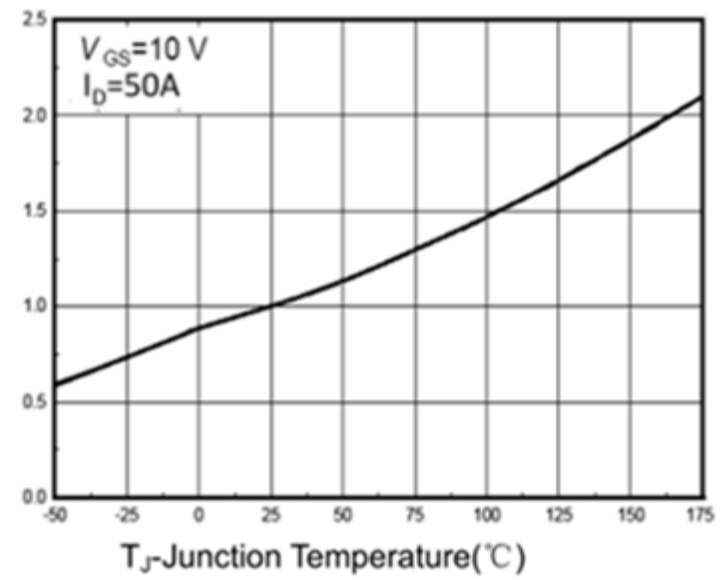


Figure 4 Rdson-Junction Temperature

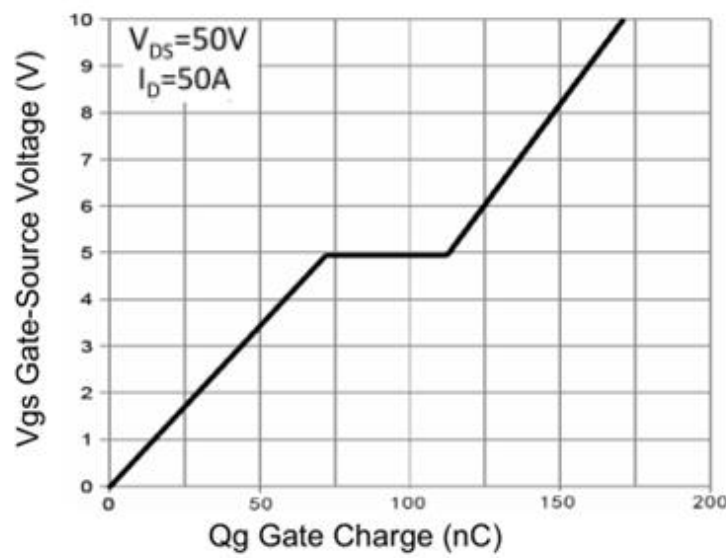


Figure 5 Gate Charge

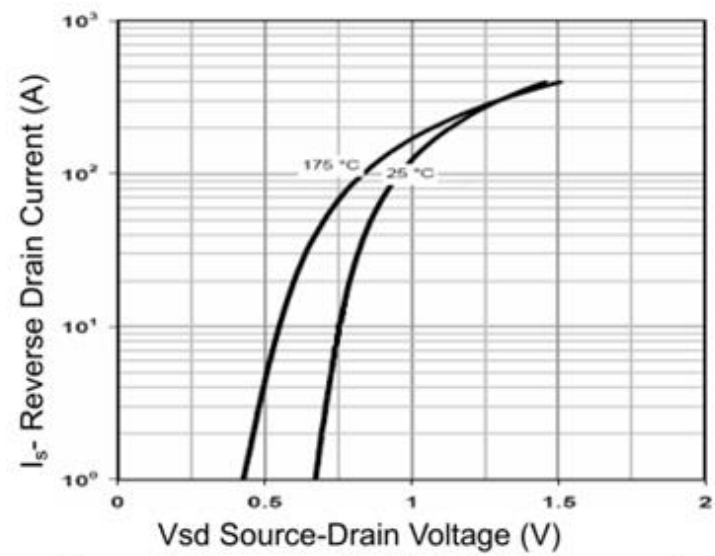
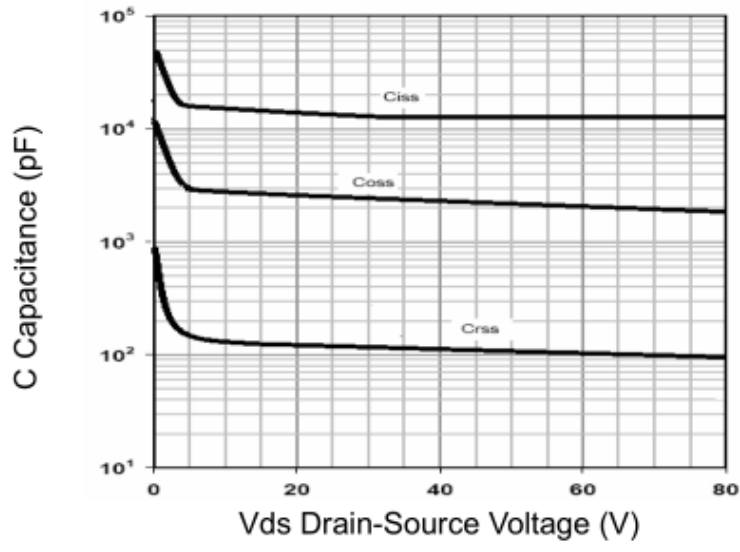
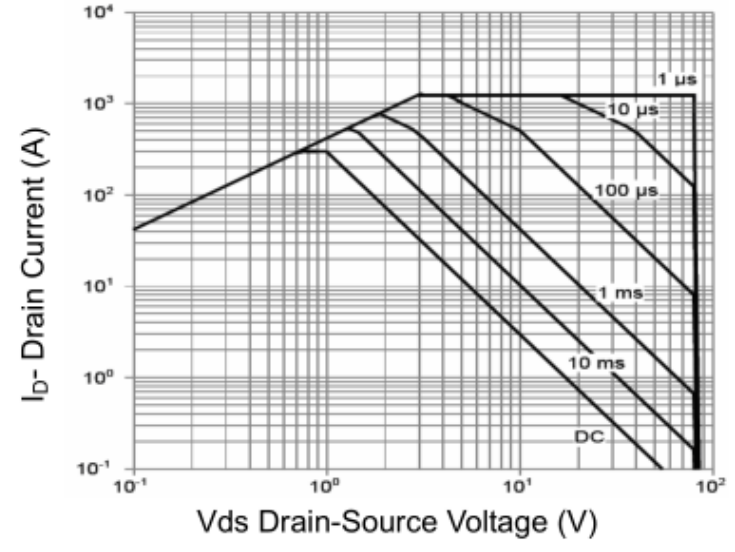


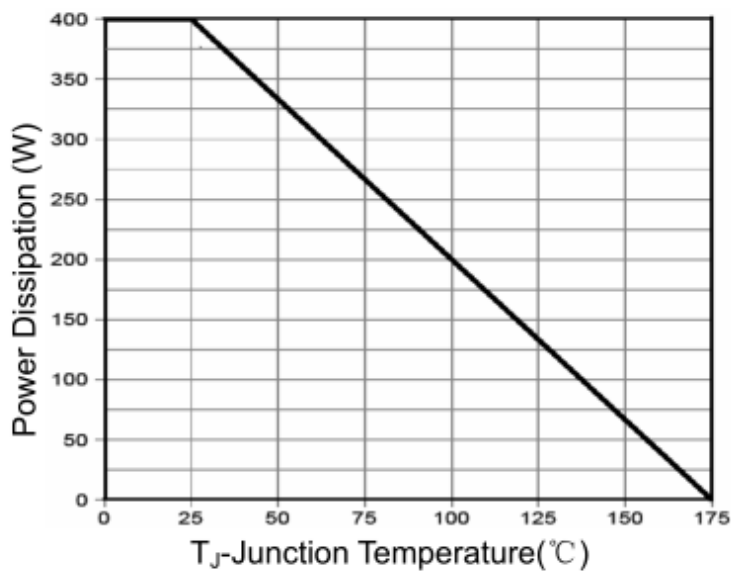
Figure 6 Source- Drain Diode Forward



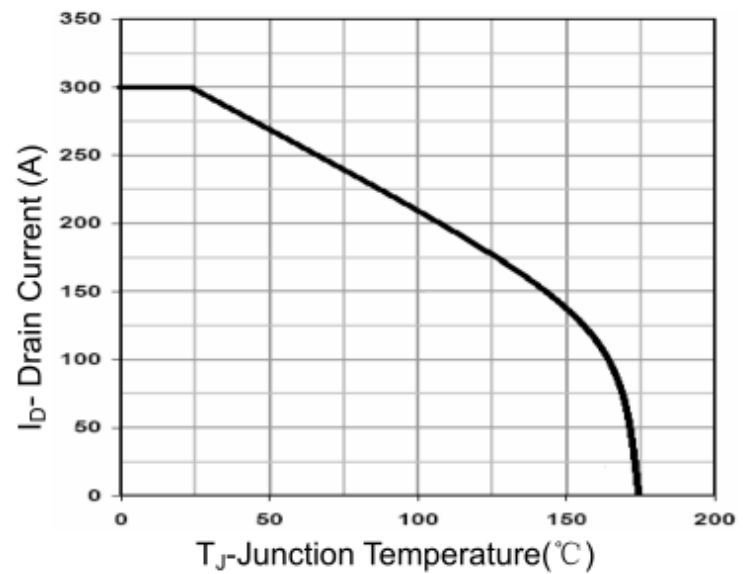
**Figure 7 Capacitance vs Vds**



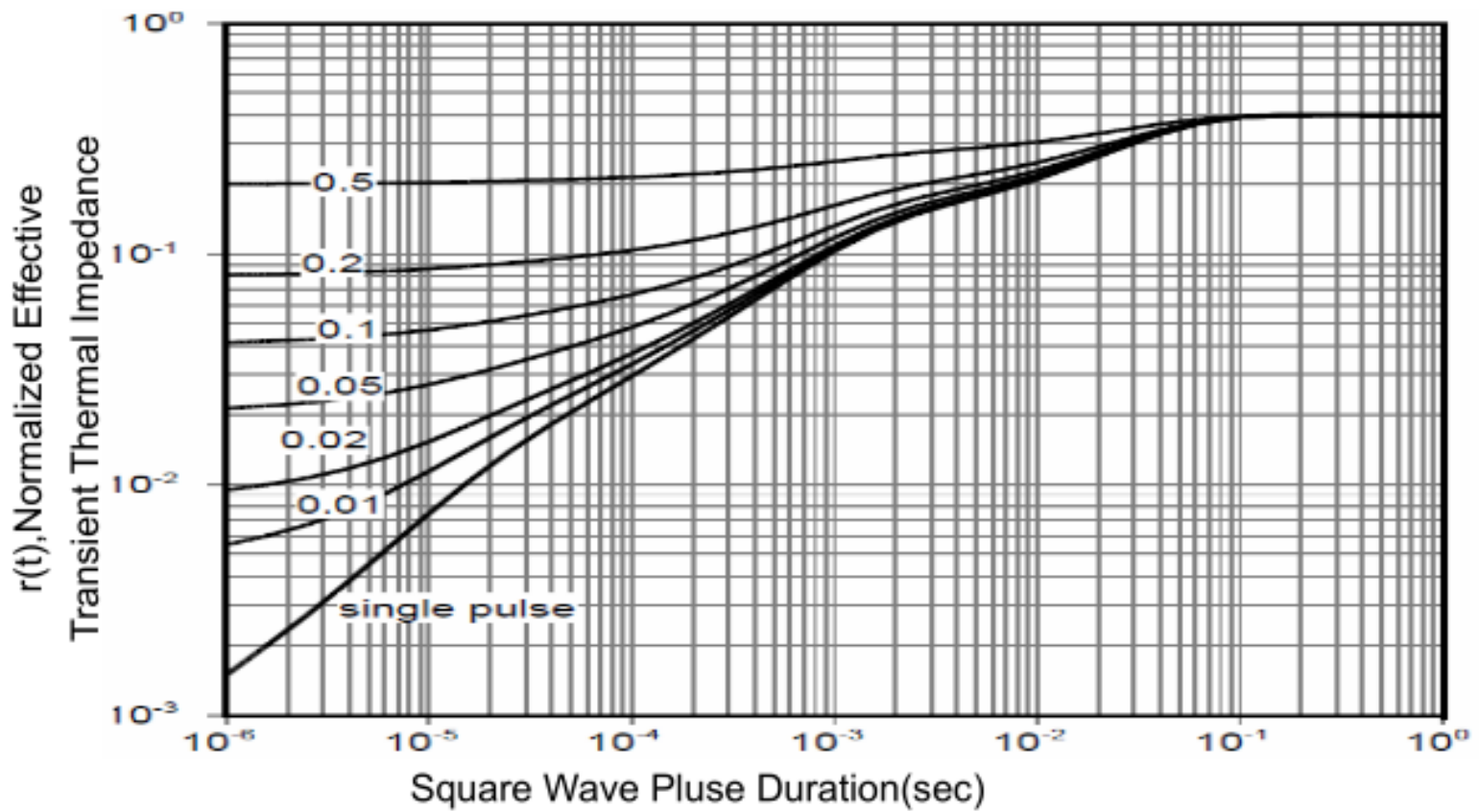
**Figure 8 Safe Operation Area**



**Figure 9 Power De-rating**



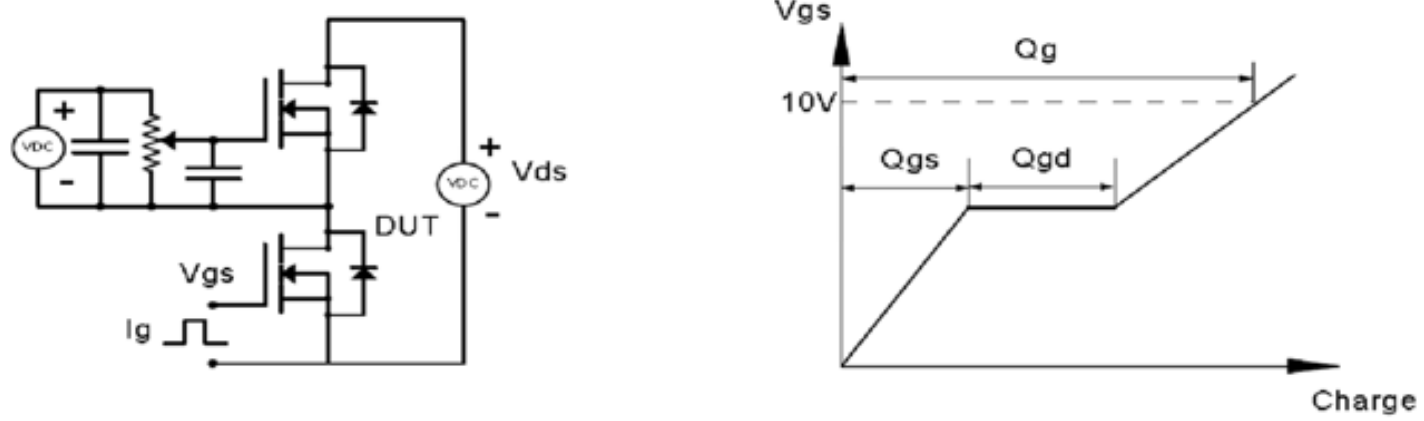
**Figure 10 Current De-rating**



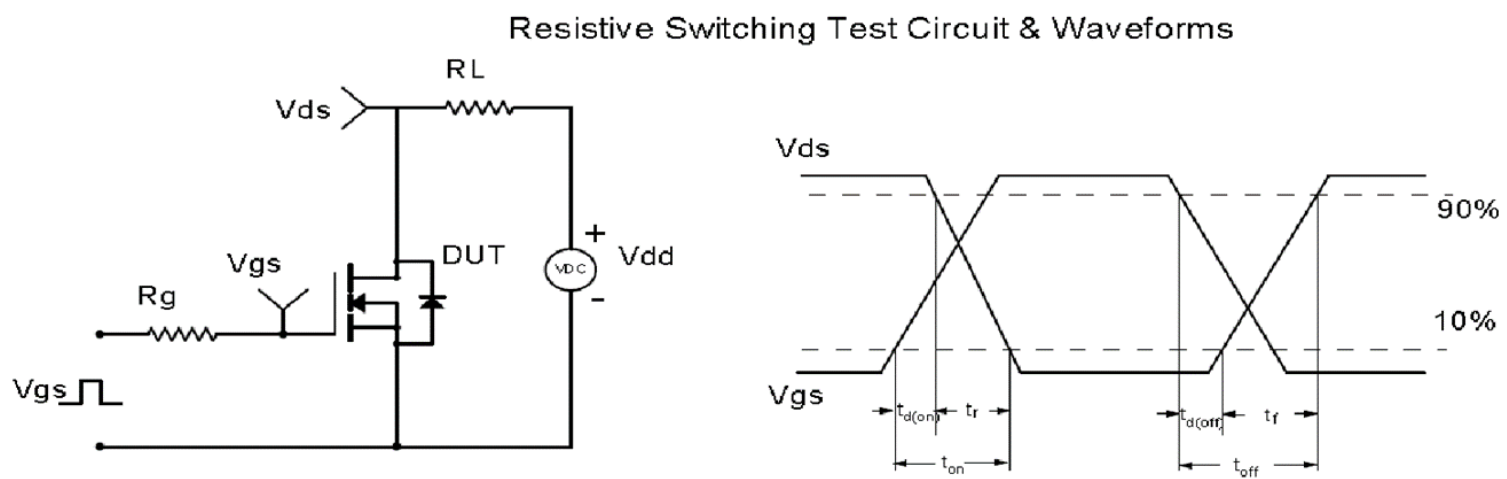
**Figure 11 Normalized Maximum Transient Thermal Impedance**

# Test Circuit & Waveform

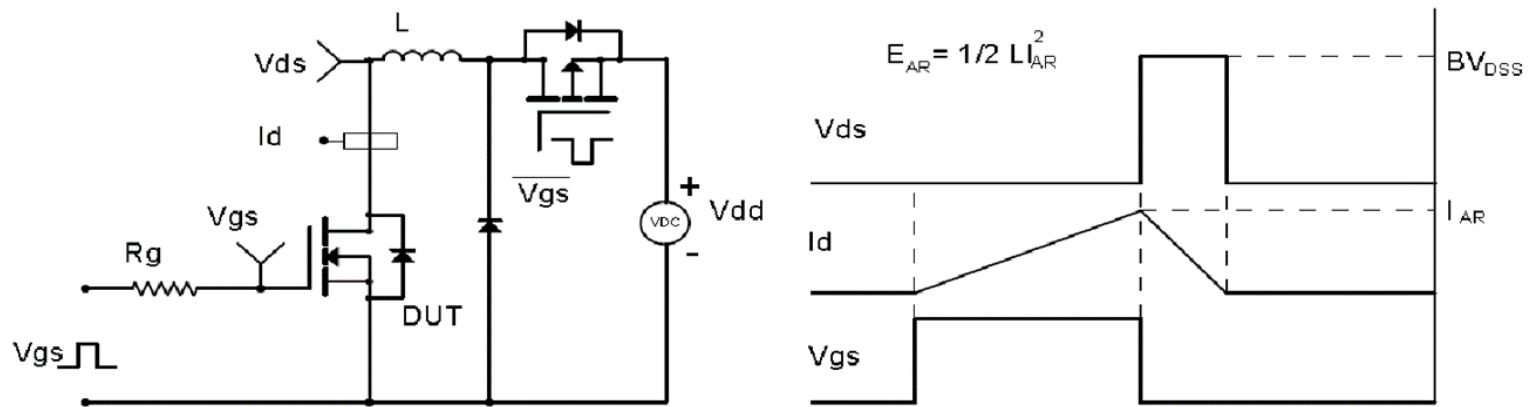
Gate Charge Test Circuit & Waveform



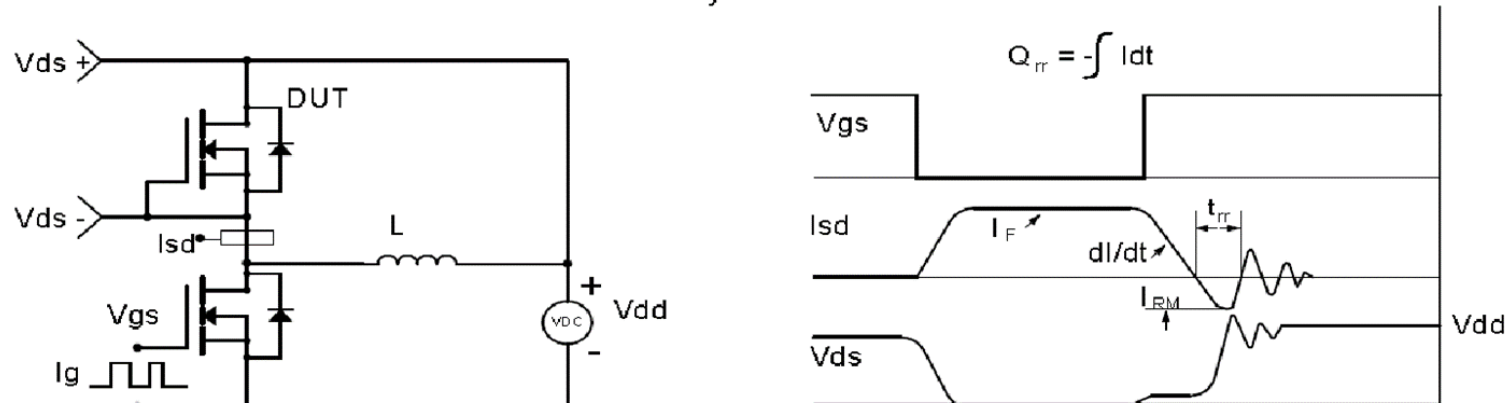
Resistive Switching Test Circuit & Waveforms



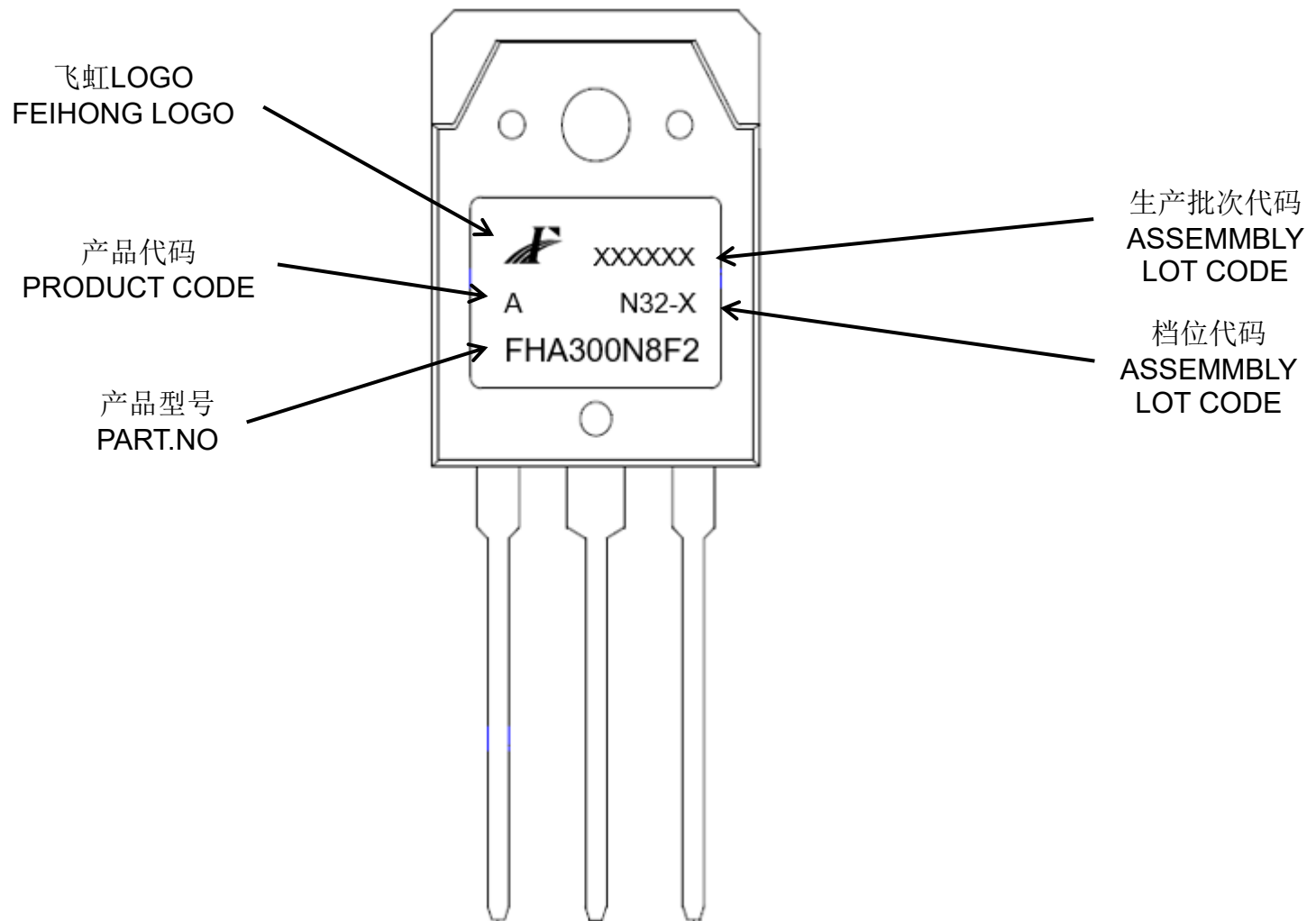
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



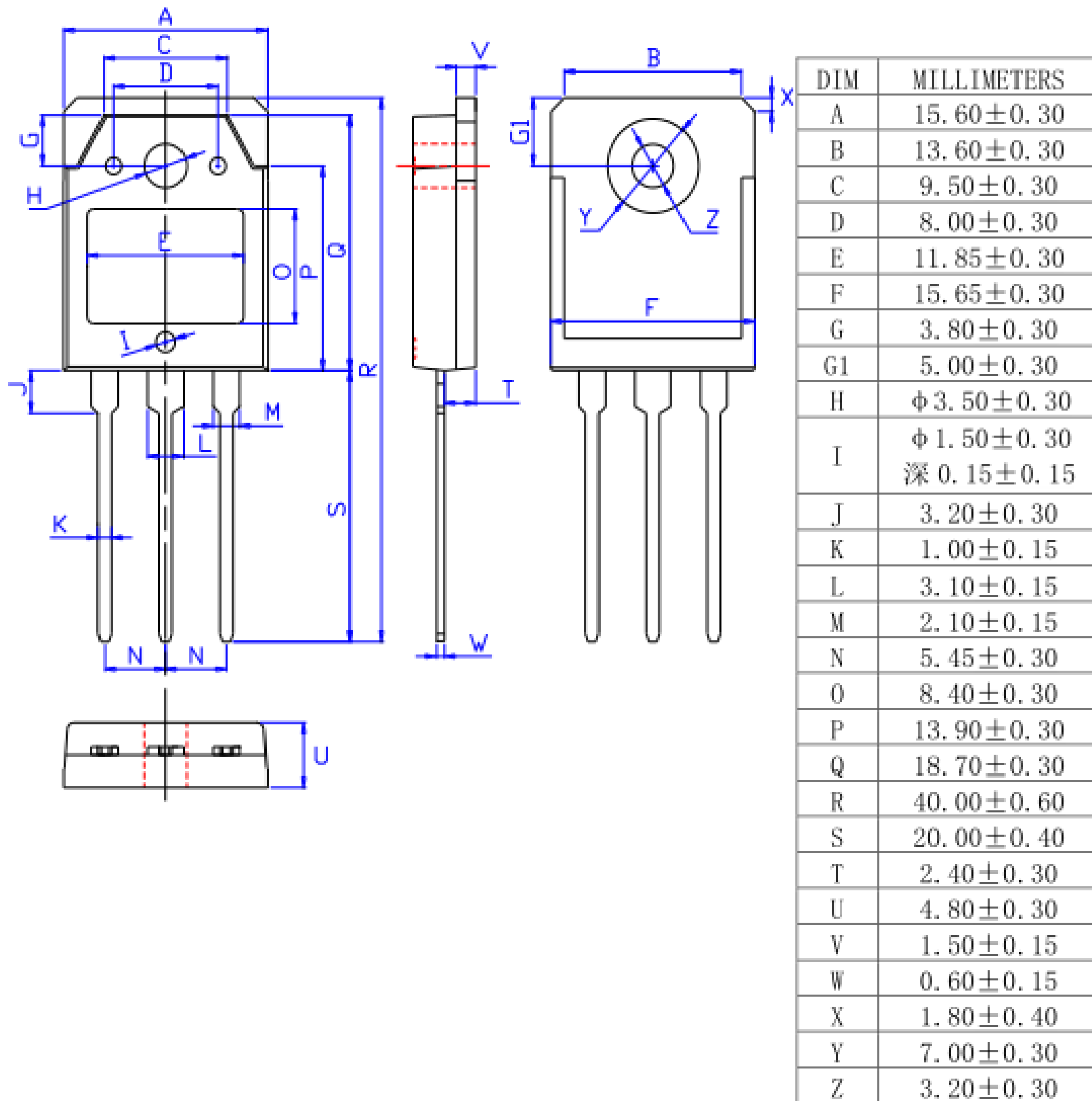
印记 Marking:



外形尺寸:

Package Dimension:

### TO-3PN



(Units: mm)