



# MP88N25C

## 主要参数 MAIN CHARACTERISTICS

ID	88 A
VDSS	250 V
Rdson ( Vgs=10V ) -MAX	43mΩ
Qg-Typ	99.36 nC

### 用途

- 高频开关电源.
- 电子镇流器
- UPS 电源

### APPLICATIONS

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS power supplies

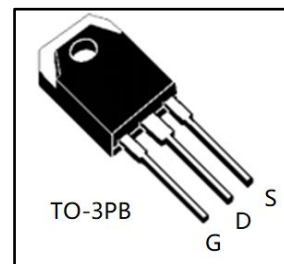
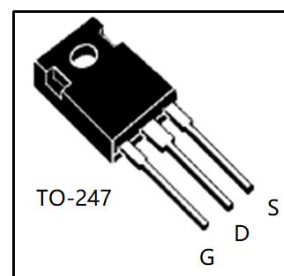
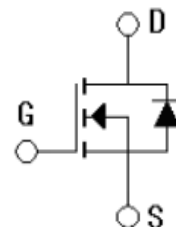
### 产品特性

- 低栅极电荷
- 低 Crss(典型值 308pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

### FEATURES

- Low gate charge
- Low Crss (typical 308pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

### 封装 Package



### 订货信息 ORDER MESSAGE

订货型号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 Halogen-Free-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
N/A	MP88N25C-GE-BR	N/A	N/A	MP88N25C	TO-247
N/A	MP88N25C-GD-BR	N/A	N/A	MP88N25C	TO-3PB

绝对最大额定值 ABSOLUTE RATINGS ( $T_C=25^\circ\text{C}$ )

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		MP88N25C	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	250	V
连续漏极电流 Drain Current - continuous	$I_D$ $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	88	A
		53	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	$I_{DM}$	352	A
最高栅源电压 Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	$E_{AS}$	4646	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	$I_{AR}$	88	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( $T_C=25^\circ\text{C}$ ) Power Dissipation	$P_D$ $T_C=25^\circ\text{C}$ -Derate above $25^\circ\text{C}$	560	W
		4.5	W
最高结温及存储温度 Operating and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

\*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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	250	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficien	$BV_{DSS}/\Delta T_J$	$I_D=250\mu A$ , referenced to $25^\circ C$	-	0.25	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=250V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	10	$\mu A$
		$V_{DS}=200V, T_C=125^\circ C$	-	-	100	$\mu A$
正向栅极体漏电流 Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
<b>通态特性 On-Characteristics</b>						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0	-	5.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=44A$	-	25	43	m $\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS}=40V, I_D=88A$ (note 4)	-	61.3	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	4132	6198	pF
输出电容 Output capacitance	$C_{oss}$		-	1946	2919	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	308	462	pF



## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=125V, I_D=88A, R_G=25\Omega,$ $V_{GS}=10V$ (note 4, 5)	-	85.6	128.4	ns
上升时间 Turn-On rise time	$t_r$		-	123.8	185.7	ns
延迟时间 Turn-Off delay time	$t_d(\text{off})$		-	164.4	246.6	ns
下降时间 Turn-Off Fall time	$t_f$		-	174.6	261.9	ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=200V,$ $I_D=88A$ $V_{GS}=10V$ (note 4, 5)	-	99.36	149.0	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	31.95	47.93	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	55.8	83.7	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		$I_S$	-	-	88	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		$I_{SM}$	-	-	352	A
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V,$ $I_S=88.0A$	-	-	1.4	V
反向恢复电流 Reverse Recovery Current	$I_{RRM}$	$V_{GS}=0V,$ $I_S=20A$ $di/dt=100A/\mu s$ (note 4)		18.46	27.69	A
反向恢复时间 Reverse recovery time	$t_{rr}$		-	196.3	-	ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$		-	1818	-	nC

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		MP88N25C	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.186	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2:  $L=1.2mH, I_{AS}=88A, V_{DD}=50V, R_G=25\Omega$ , 起始结温  $T_J=25^{\circ}C$
- 3:  $I_{SD}\leq 88A, di/dt\leq 200A/\mu s, V_{DD}\leq BV_{DSS}$ , 起始结温  $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$ , 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

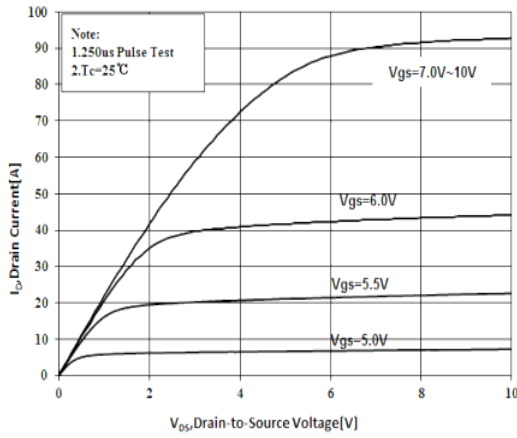
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2:  $L=1.2mH, I_{AS}=88A, V_{DD}=50V, R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$
- 3:  $I_{SD}\leq 88A, di/dt\leq 200A/\mu s, V_{DD}\leq BV_{DSS}$ , Starting  $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
- 5: Essentially independent of operating temperature

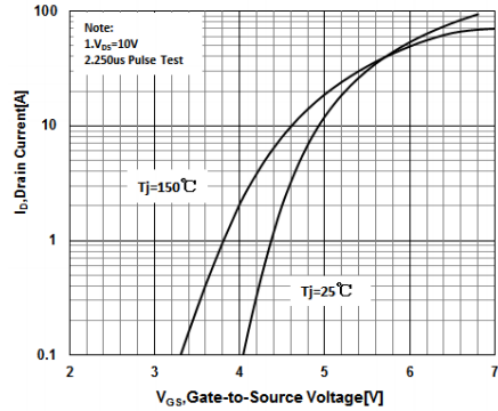


## 特征曲线 ELECTRICAL CHARACTERISTICS (curves)

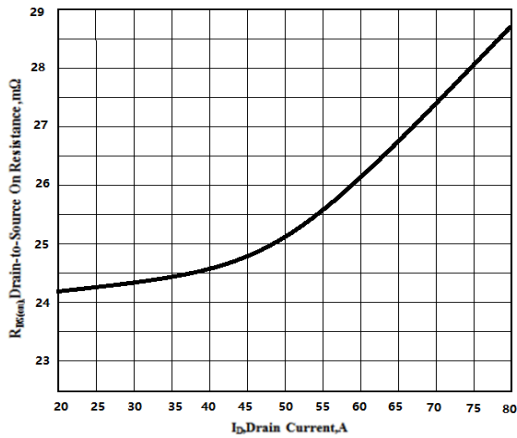
### Transfer Characteristics



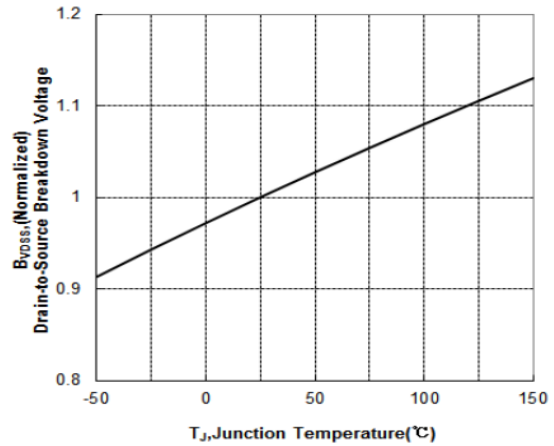
### On-Region Characteristics



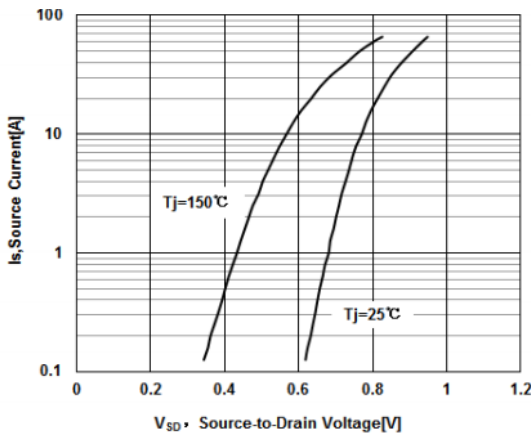
### On-Resistance Variation vs. ID



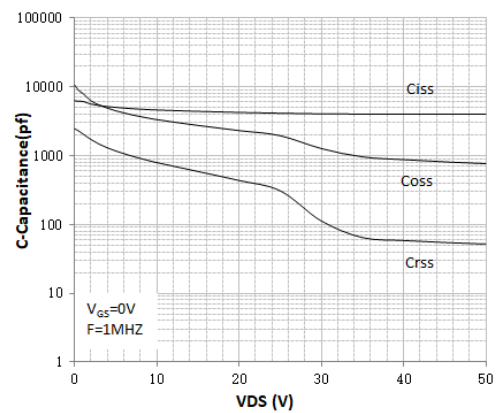
### Breakdown Voltage Variation vs. Temperature



### Body Diode Forward Voltage Variation vs. Source Current and Temperature



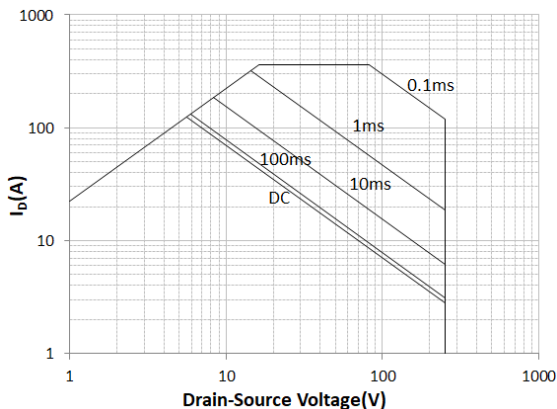
### Capacitance Characteristics



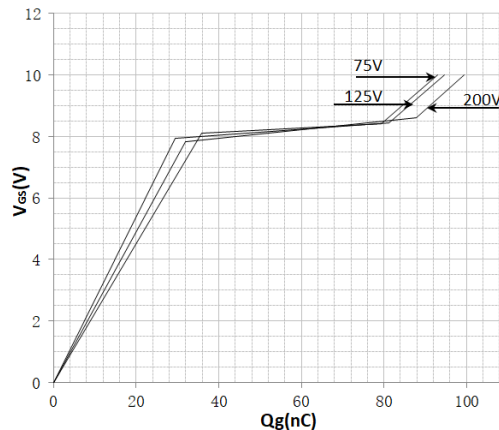


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

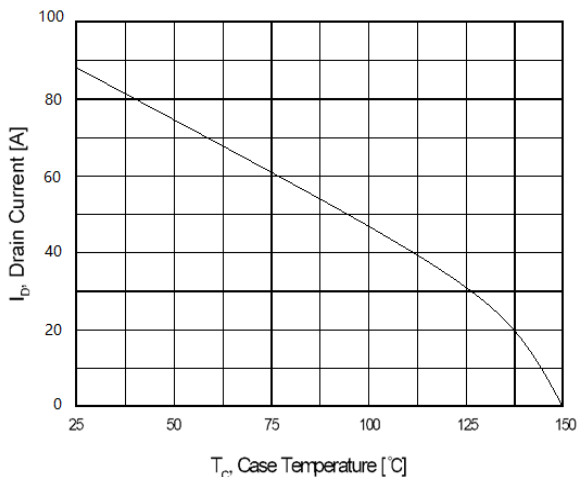
Maximum Safe Operating Area for



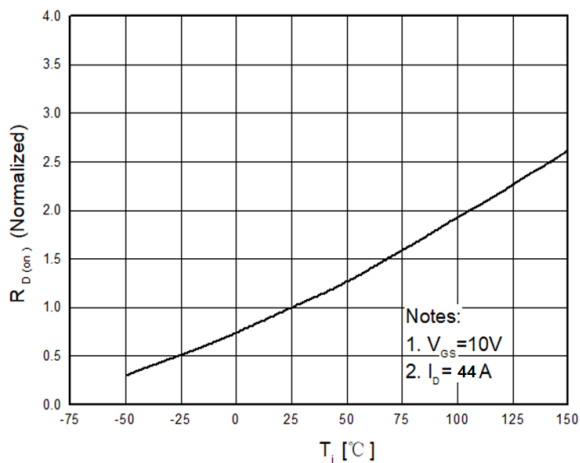
Gate charge vs. Vgs



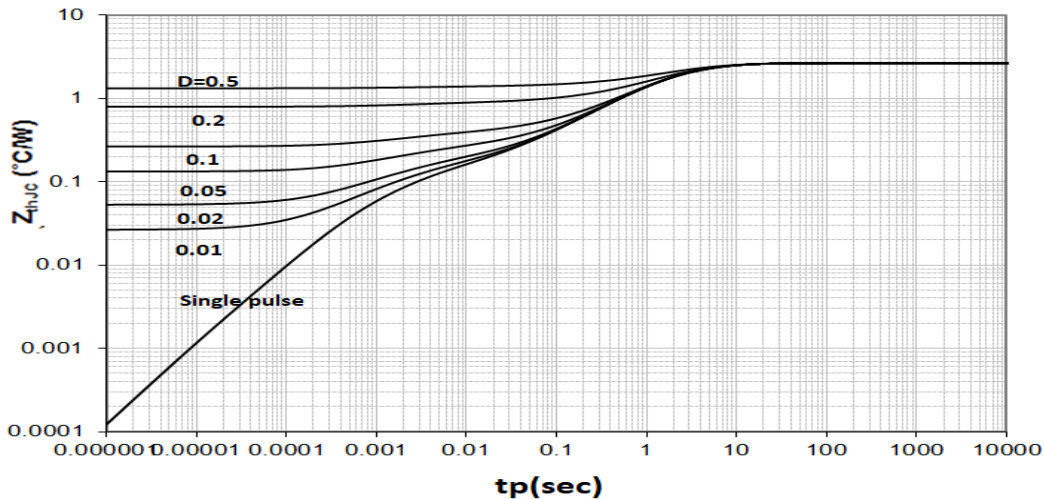
Maximum Drain Current vs. Case Temperature



On-Resistance Variation vs. Temperature



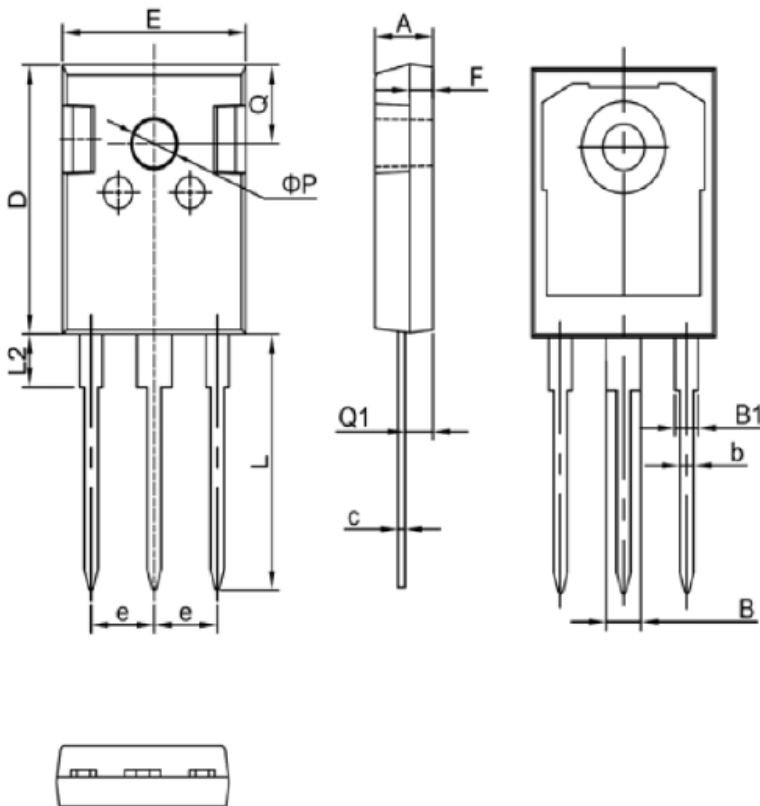
Thermal impedance Response Curve





TO-247

单位 Unit: mm

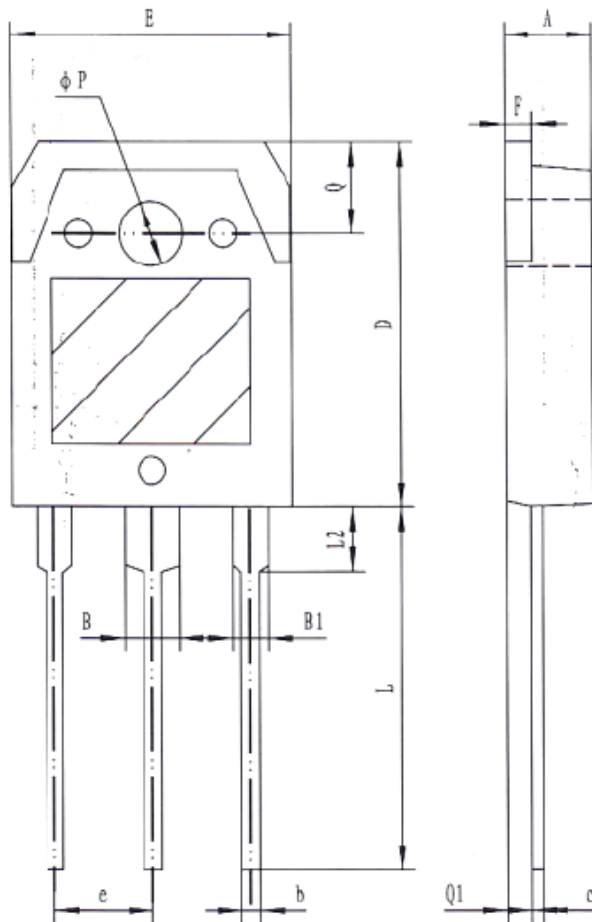


符号 symbol	MIN	MAX
A	4.90	5.10
B	2.95	3.35
B1	1.95	2.35
b	1.15	1.35
c	0.50	0.70
D	20.90	21.10
E	15.70	15.90
e	5.34	5.54
F	1.90	2.10
L	19.40	20.40
L2	4.03	4.23
Q	6.00	6.40
Q1	2.30	2.50
P	3.50	3.70



TO-3PB

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.60	5.00
B	2.90	3.20
B1	1.90	2.20
b	0.90	1.10
c	0.50	0.70
D	19.40	20.40
E	15.40	15.80
e	5.45(TYP)	
F	1.40	1.60
L	19.50	20.50
L2	3.30	3.70
Q	4.90	5.10
Q1	1.30	1.50
P	3.10	3.50





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