



# JCS7N120A

## 主要参数 MAIN CHARACTERISTICS

$I_D$	7 A
$V_{DS}$	1200 V
$R_{dson} (V_{gs}=10V)$ -MAX	1.5 $\Omega$
$Q_g$ -Typ	61.13 nC

### 用途

- 高频开关电源.
- 电子镇流器
- LED 电源

### APPLICATIONS

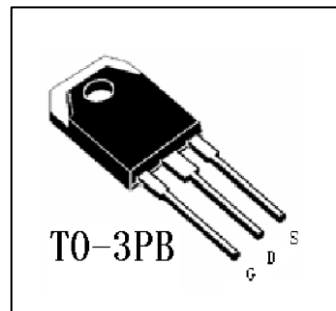
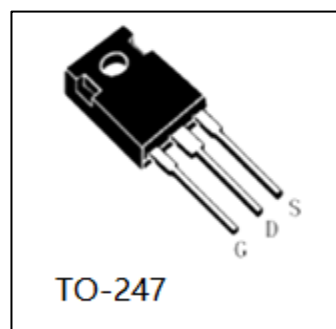
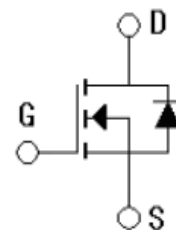
- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- LED power supplies

### 产品特性

- 平面 MOS
- 低栅极电荷
- 低  $C_{rss}$  (典型值 7.87pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗  $dv/dt$  能力
- RoHS 产品
- Planar MOS
- Low gate charge
- Low  $C_{rss}$  (typical 7.87pF)
- Fast switching
- 100% avalanche tested
- Improved  $dv/dt$  capability
- RoHS product

### FEATURES

## 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		
JCS7N120ABA-GD-B	JCS7N120ABA-GD-BR	N/A	N/A	JCS7N120ABA	TO-3PB
JCS7N120WA-GE-B	JCS7N120WA-GE-BR	N/A	N/A	JCS7N120WA	TO-247

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
		JCS7N120ABA	JCS7N120WA	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	1200		V
连续漏极电流 Drain Current -continuous	$I_D$ $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	7		A
		4.2		A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	$I_{DM}$	28		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)	$E_{AS}$	142		mJ
雪崩电流 (注 1) Avalanche Current (note 1)	$I_{AR}$	7		A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	$E_{AR}$	42		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	4.5		V/ns
耗散功率( $T_c=25^\circ\text{C}$ ) Power Dissipation	$P_D$ $T_c=25^\circ\text{C}$ -Derate above $25^\circ\text{C}$	484		W
		3.87		W/ $^\circ\text{C}$
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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	1200	-	-	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°C	-	9.6	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=1200V,$ $V_{GS}=0V, T_C=25^\circ C$	-	-	5	$\mu A$
		$V_{DS}=960V,$ $T_C=125^\circ C$	-	-	10	$\mu A$
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.5A$	-	1.35	1.5	$\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS}=40V, I_D=7A$ (note 4)	-	7.1	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	3241	4860	pF
输出电容 Output capacitance	$C_{oss}$		-	229	343	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	7.87	12	pF



## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	V <sub>DD</sub> =600V, I <sub>D</sub> =7A, V <sub>GS</sub> =10V, R <sub>G</sub> =25Ω (note 4, 5)	-	66.6	100	ns
上升时间 Turn-On rise time	$t_r$		-	51	76.5	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	154	231	ns
下降时间 Turn-Off Fall time	$t_f$		-	47.2	70.8	ns
栅极电荷总量 Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =960V, V <sub>GS</sub> =10V, I <sub>D</sub> =7A (note 4, 5)	-	61.13	91.7	nC
栅-源电荷 Gate-Source charge	Q <sub>gs</sub>		-	22.92	34.4	nC
栅-漏电荷 Gate-Drain charge	Q <sub>gd</sub>		-	18.64	28	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 <sub>S</sub>	-	-	7	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	28	A
正向压降 Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =7.0A	-	-	1.5	V
反向恢复时间 Reverse recovery time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =7.0A di/dt=100A/μs (note 4)	-	686	-	ns
反向恢复电荷 Reverse recovery charge	Q <sub>rr</sub>		-	5904	-	nC

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max		单 位 Unit
		JCS7N120ABA	JCS7N120WA	
结到管壳的热阻 Thermal Resistance, Junction to Case	R <sub>th(j-c)</sub>	0.215		°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	R <sub>th(j-A)</sub>	62.5		°C/W

注释:

- 1: 脉冲宽度由最高结温限制
- 2: L=5.8mH, I<sub>AS</sub>=7A, V<sub>DD</sub>=100V, R<sub>G</sub>=25 Ω, 起始结温 T<sub>J</sub>=25°C
- 3: I<sub>SD</sub>≤7A, di/dt≤200A/μs, V<sub>DD</sub>≤BVDSS, 起始结温 T<sub>J</sub>=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

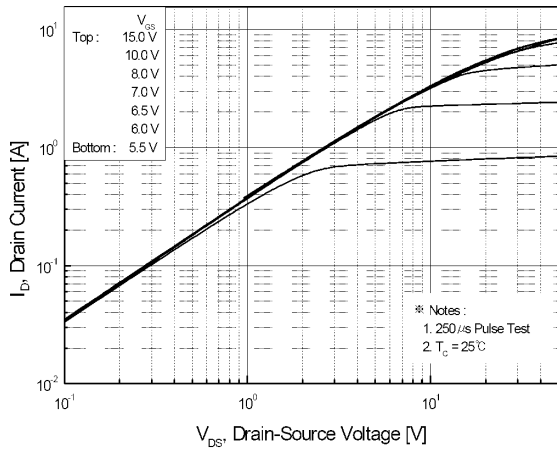
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: L=5.8mH, I<sub>AS</sub>=7A, V<sub>DD</sub>=100V, R<sub>G</sub>=25 Ω, Starting T<sub>J</sub>=25°C
- 3: I<sub>SD</sub>≤7A, di/dt≤200A/μs, V<sub>DD</sub>≤BVDSS, Starting T<sub>J</sub>=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%
- 5: Essentially independent of operating temperature

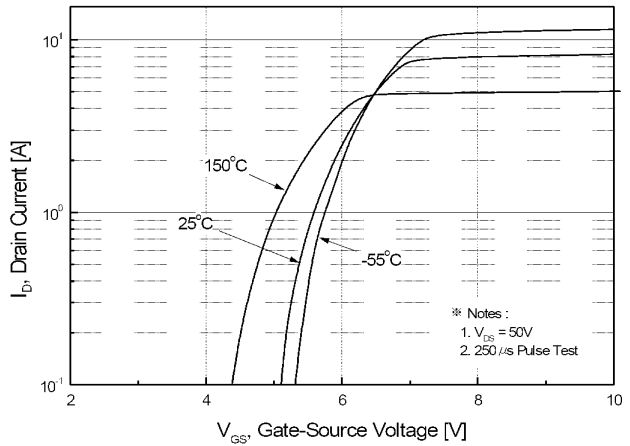


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

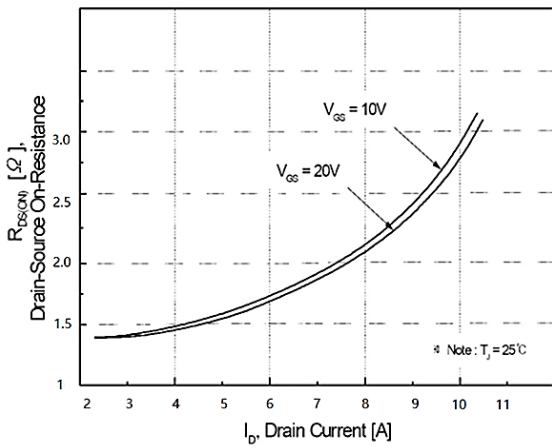
On-Region Characteristics



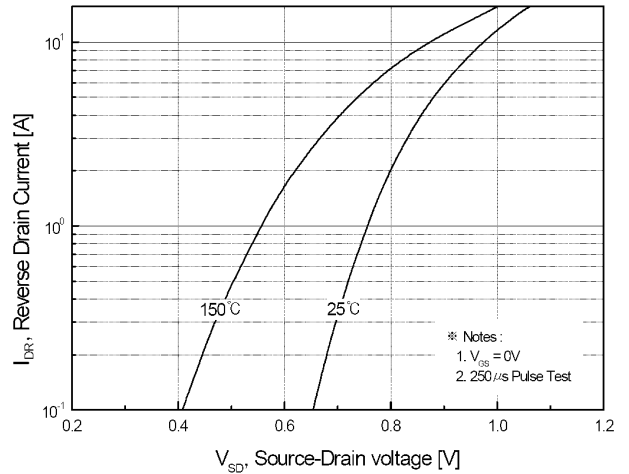
Transfer Characteristics



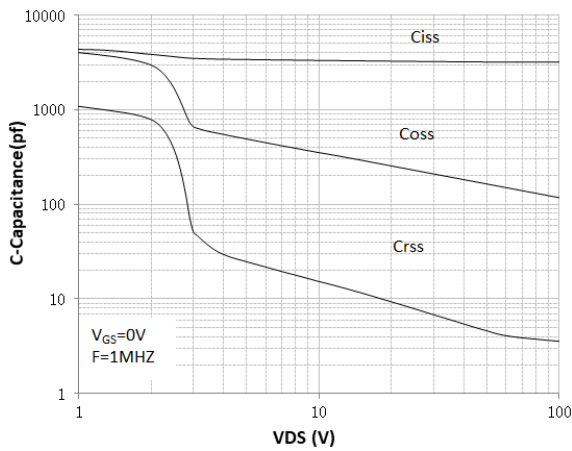
On-Resistance Variations vs.  $I_D$



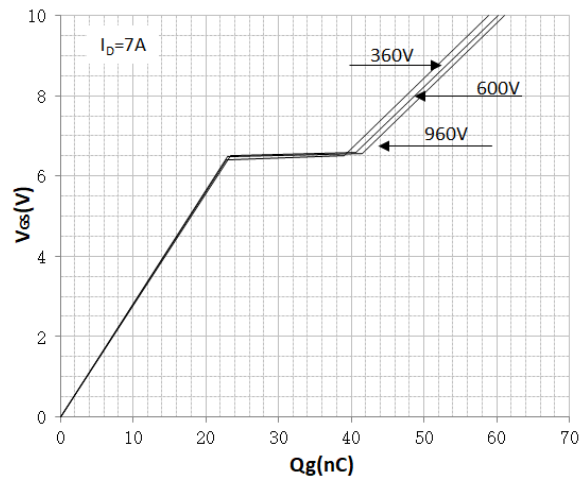
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



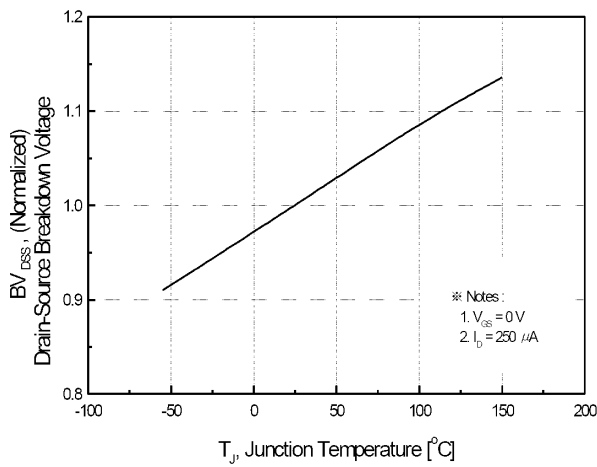
Gate charge vs.  $V_{GS}$



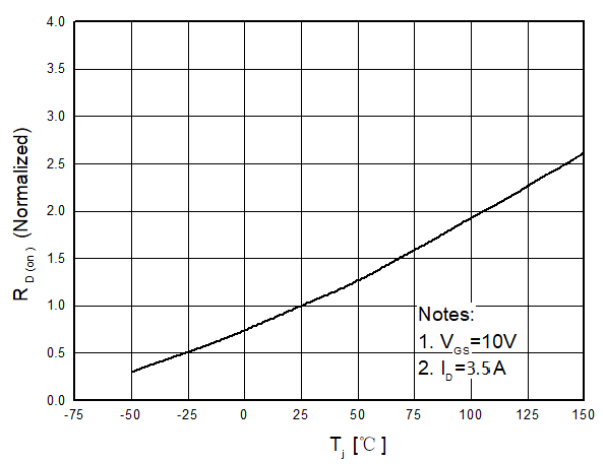


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

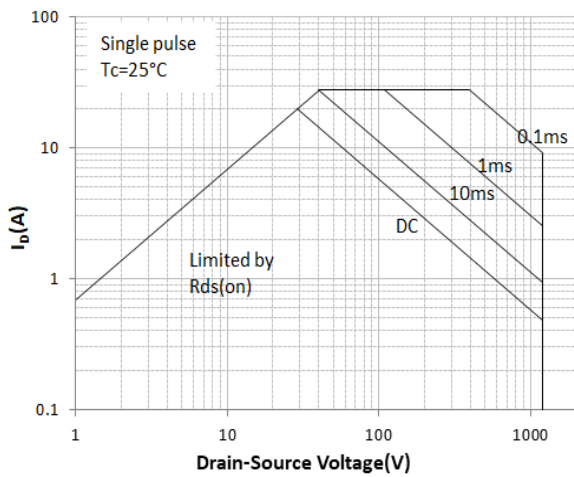
Breakdown Voltage Variation vs. Temperature



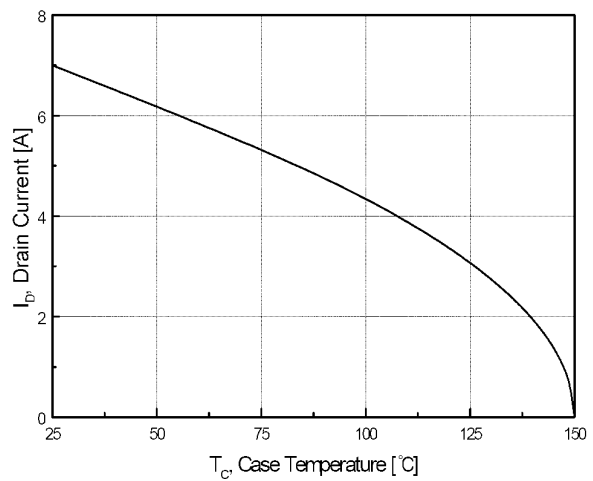
On-Resistance Variation vs. Temperature



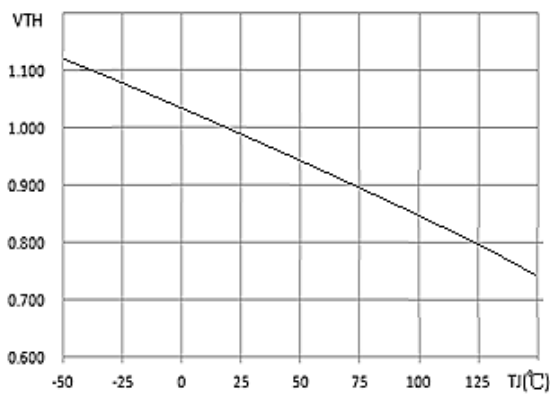
Maximum Safe Operating Area for JCS7N120ABA/WA



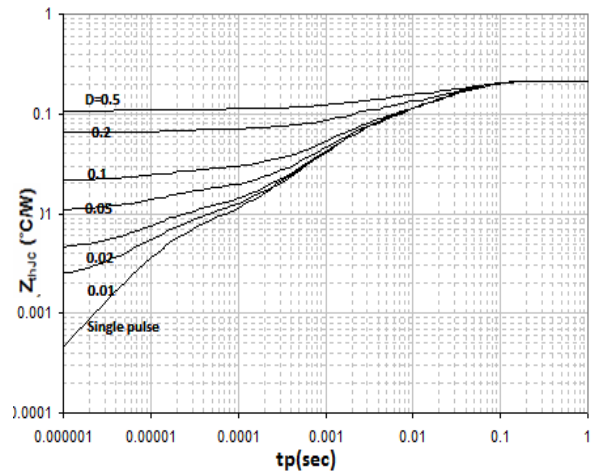
Maximum Drain Current vs. Case Temperature



Normalized VTH vs. temperature



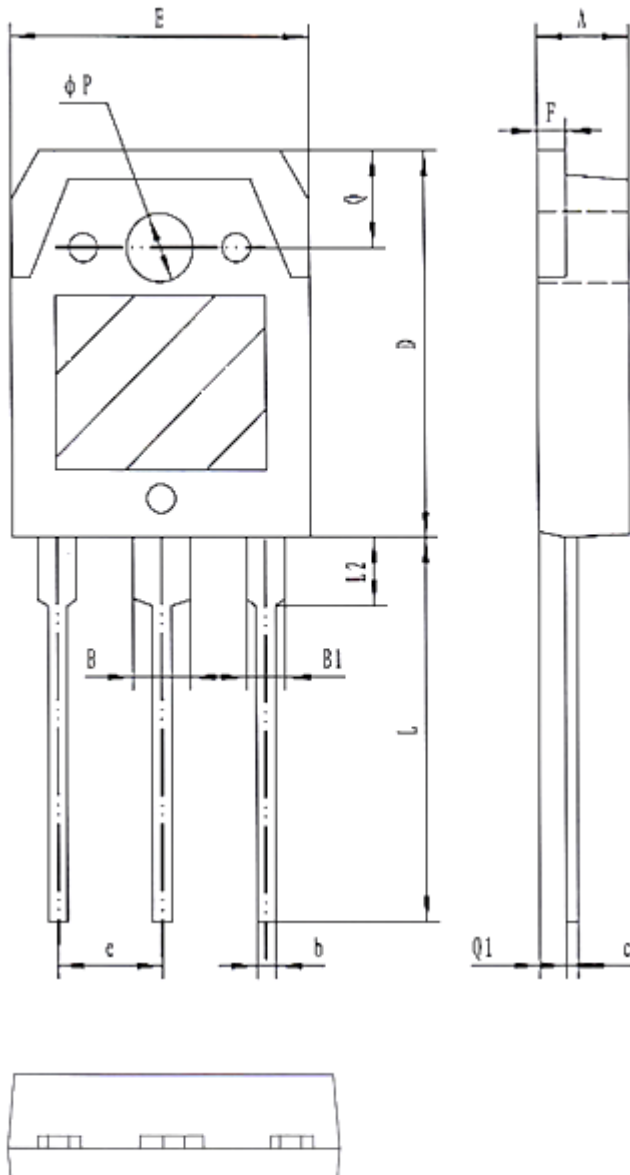
Thermal impedance for JCS7N120ABA/WA





TO-3PB

单位 Unit: mm

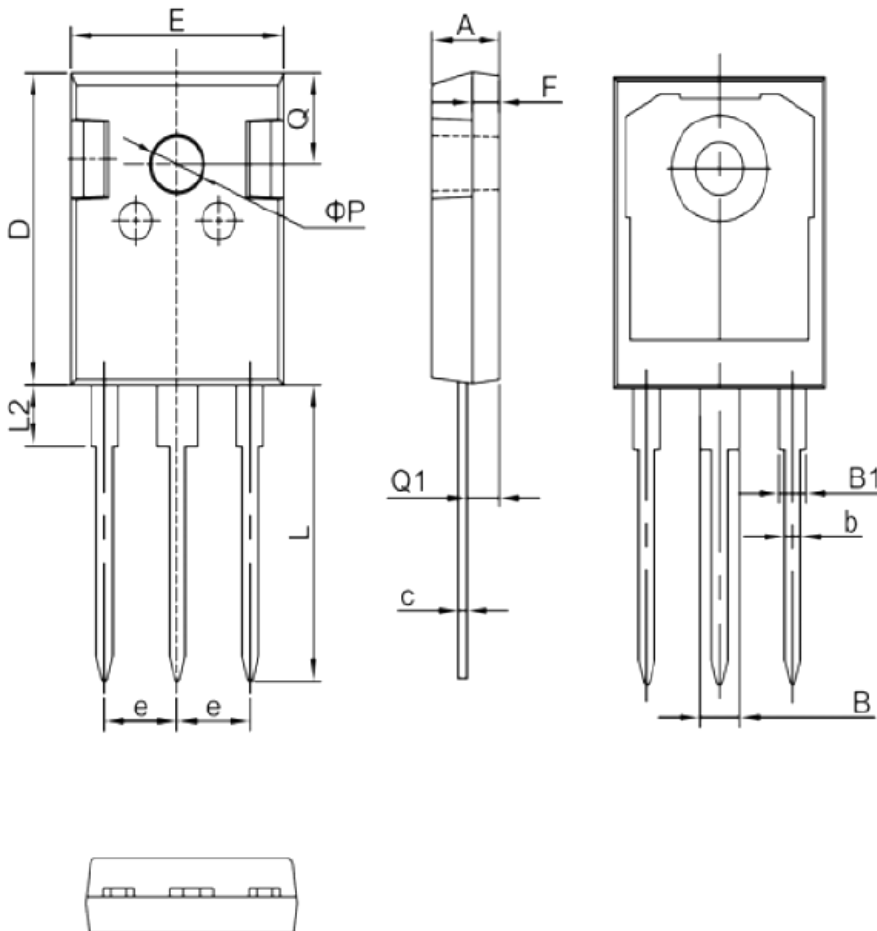


符号 symbol	MIN	MAX
A	4.60	5.00
B	2.90	3.20
B1	1.90	2.20
b	0.90	1.10
c	0.50	0.70
D	19.40	20.40
E	15.40	15.80
e	5.45(TYP)	
F	1.40	1.60
L	19.50	20.50
L2	3.30	3.70
Q	4.90	5.10
Q1	1.30	1.50
P	3.10	3.50



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





## 注意事项

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