



# JCS840

## 主要参数 MAIN CHARACTERISTICS

$I_D$	8 A
$V_{DSS}$	500 V
$R_{dson-max}$ (@ $V_{gs}=10V$ )	0.8 $\Omega$
$Q_g-typ$	59 nC

### 用途

- 高频开关电源
- 电子镇流器
- UPS 电源

### 产品特性

- 低栅极电荷
- 低 $C_{rss}$  (典型值 35pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

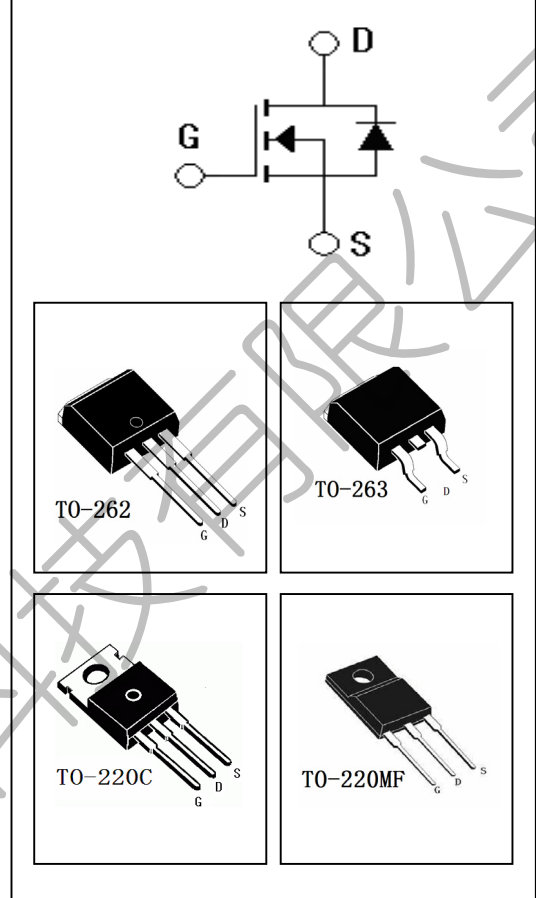
### APPLICATIONS

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

### FEATURES

- Low gate charge
- Low  $C_{rss}$  (typical 35pF)
- 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	无卤素 Halogen Free	包 装 Packaging	器件重量 Device Weight
JCS840S-O-S-N-B	JCS840S	TO-263	否 NO	条管 Tube	1.37 g(typ)
JCS840B-O-B-N-B	JCS840B	TO-262	否 NO	条管 Tube	1.71 g(typ)
JCS840C-O-C-N-B	JCS840C	TO-220C	否 NO	条管 Tube	2.15 g(typ)
JCS840F-O-F-N-B	JCS840F	TO-220MF	否 NO	条管 Tube	2.20 g(typ)





## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项 目 Parameter	符 号 Symbol	数 值 Value		单 位 Unit
		JCS840S/B/C	JCS840F	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	500		V
连续漏极电流 Drain Current -continuous	$I_D$ T=25℃ T=100℃	8.0	8.0*	A
		5.1	5.1*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	$I_{DM}$	32	32*	A
最高栅源电压 Gate-Source Voltage	$V_{GSS}$	±30		V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	$E_{AS}$	320		mJ
雪崩电流 (注1) Avalanche Current (note 1)	$I_{AR}$	8.0		A
重复雪崩能量 (注1) Repetitive Avalanche Current (note 1)	$E_{AR}$	13.4	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	3.5		V/ns
耗散功率 Power Dissipation	$P_D$ T <sub>C</sub> =25℃ -Derate above 25℃	134	44	W
		1.08	0.35	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+150		℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300		℃

\*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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	500	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$ , referenced to $25^\circ C$	-	0.50	-	$V/^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=500V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	10	$\mu A$
		$V_{DS}=400V, T_C=125^\circ C$	-	-	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	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=4.0A$	-	0.65	0.8	$\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS} = 40V, I_D=4.0A$ (note 4)	-	7.3	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	1400	1800	pF
输出电容 Output capacitance	$C_{oss}$		-	145	190	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	35	45	pF



**电特性 ELECTRICAL CHARACTERISTICS**

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=250V, I_D=8.0A, R_G=25\Omega$	-	22	55	ns
上升时间 Turn-On rise time	$t_r$	$V_{GS}=10V$	-	65	140	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$	(note 4, 5)	-	125	260	ns
下降时间 Turn-Off Fall time	$t_f$		-	75	160	ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=400V,$	-	59	70	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$	$I_D=8.0A$	-	6.5	-	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$	$V_{GS}=10V$ (note 4, 5)	-	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		$I_S$	-	-	8.0	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		$I_{SM}$	-	-	32	A
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=8.0A$	-	-	1.4	V
反向恢复时间 Reverse recovery time	$t_{rr}$	$V_{GS}=0V, I_S=8.0A$	-	390	-	ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$	$di/dt=100A/\mu s$ (note 4)	-	4.2	-	$\mu C$

**热特性 THERMAL CHARACTERISTIC**

项 目 Parameter	符 号 Symbol	最大 Max		单 位 Unit
		JCS840S/B/C	JCS840F	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.93	2.86	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	62.5	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2:  $L=9.0mH, I_{AS}=8.0A, V_{DD}=50V, R_G=25\Omega$ , 起始结温  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 8.0A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , 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

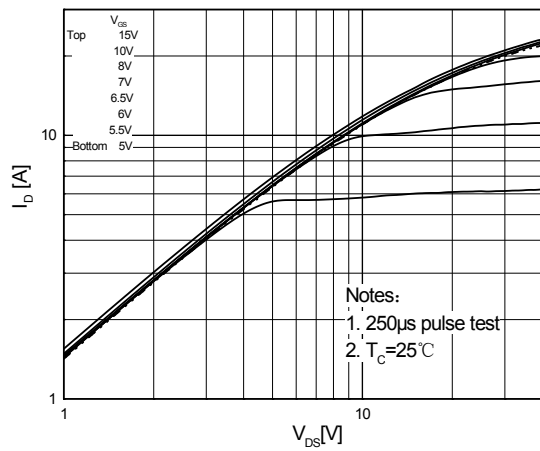
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2:  $L=9.0mH, I_{AS}=8.0A, V_{DD}=50V, R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 8.0A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , 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

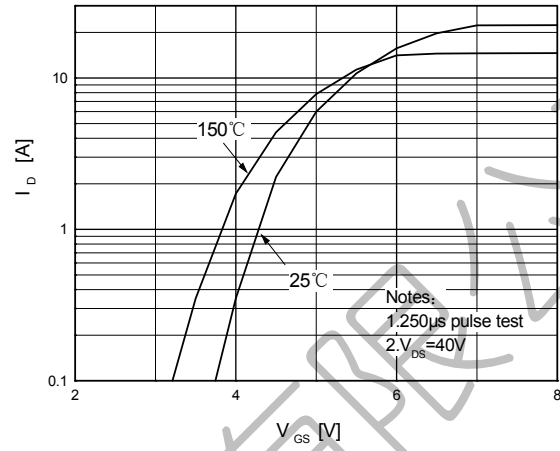


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

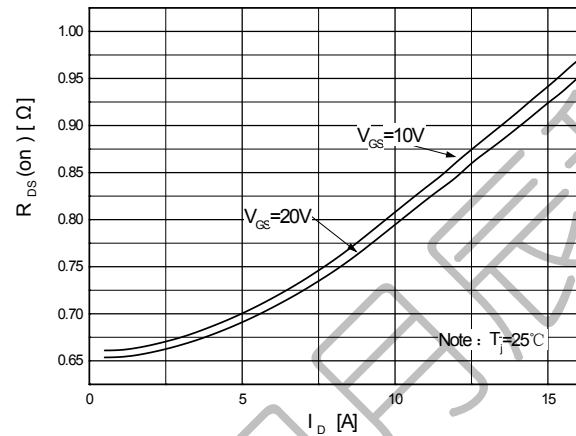
**On-Region Characteristics**



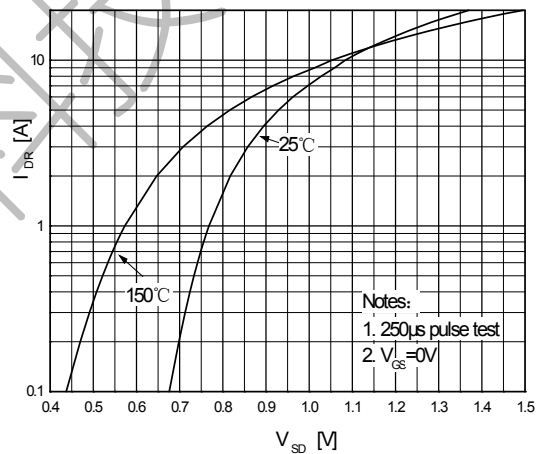
**Transfer Characteristics**



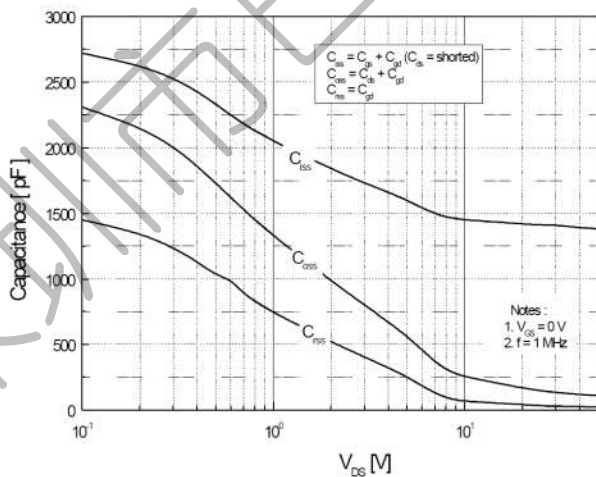
**On-Resistance Variation vs. Drain Current and Gate Voltage**



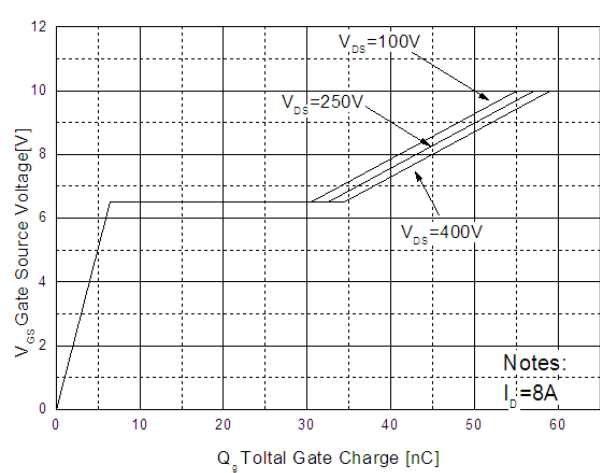
**Body Diode Forward Voltage Variation vs. Source Current and Temperature**



**Capacitance Characteristics**



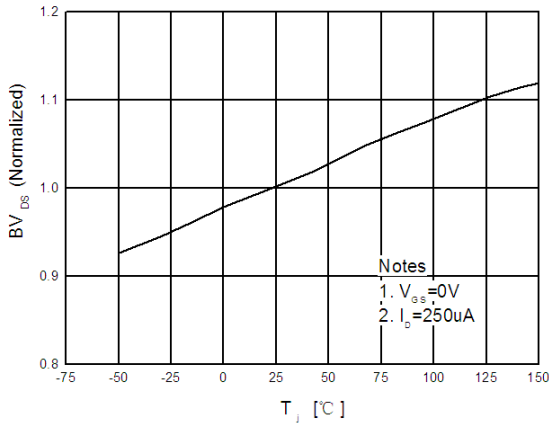
**Gate Charge Characteristics**



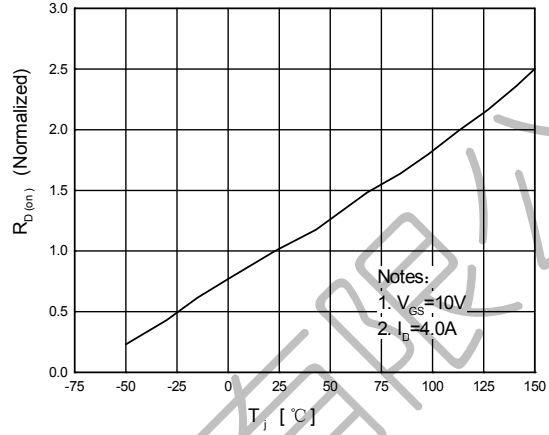


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

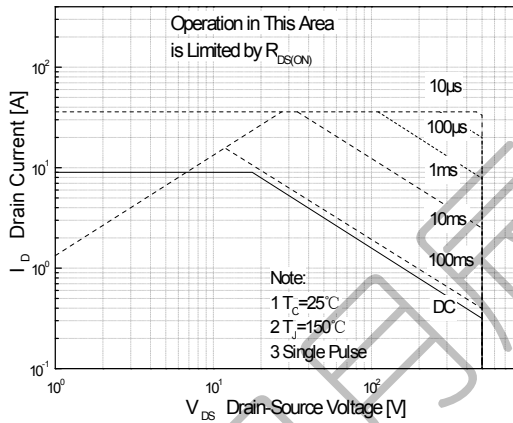
Breakdown Voltage Variation vs. Temperature



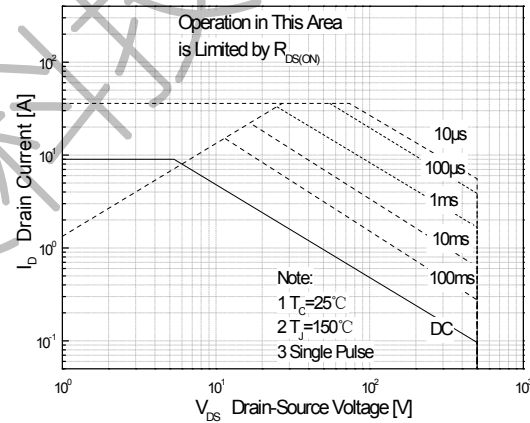
On-Resistance Variation vs. Temperature



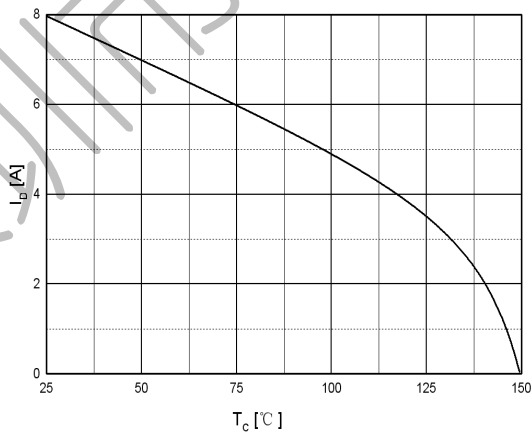
Maximum Safe Operating Area For JCS840S/B/C



Maximum Safe Operating Area For JCS840F

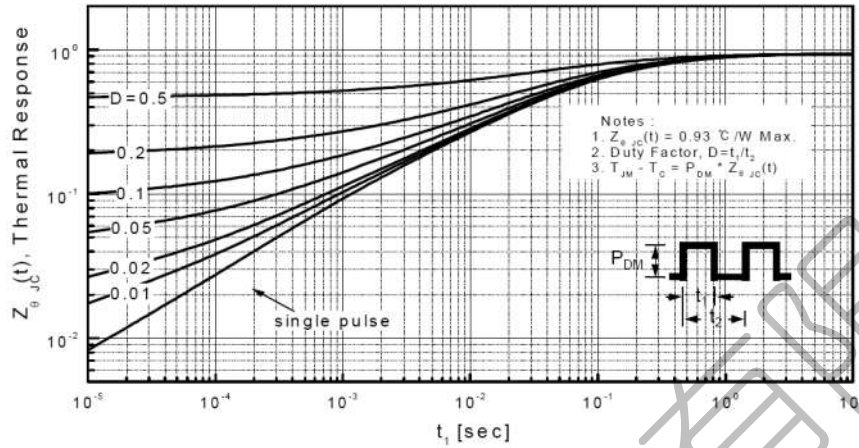


Maximum Drain Current vs. Case Temperature

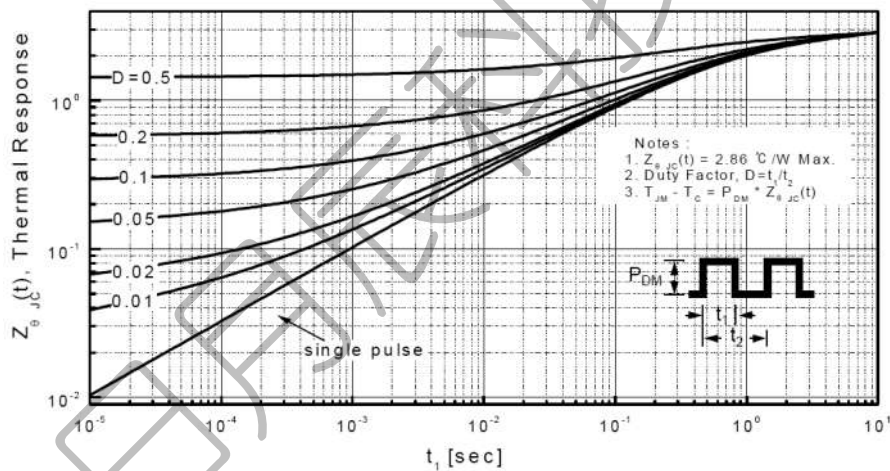


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

**Transient Thermal Response Curve  
For JCS840S/B/C**



**Transient Thermal Response Curve  
For JCS840F**

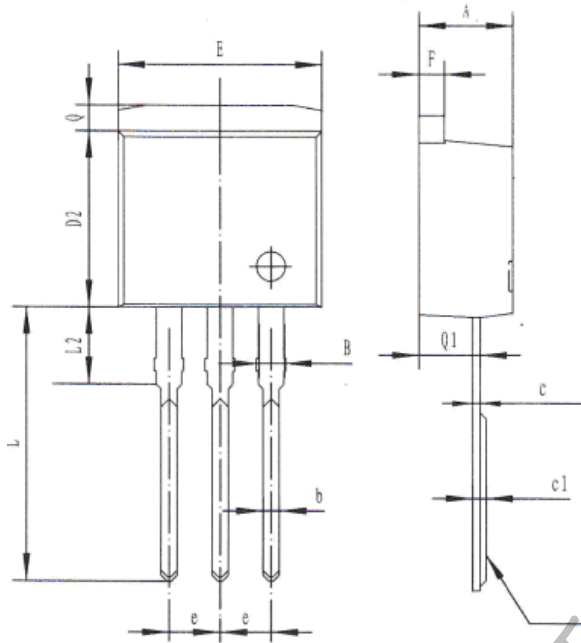




## 外形尺寸 PACKAGE MECHANICAL DATA

TO-262

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.40	4.90
B	1.10	1.40
b	0.70	0.95
c	0.30	0.60
c1	0.33	0.63
D2	8.20	9.20
E	9.60	10.50
e	2.39	2.69
F	1.20	1.35
L	13.11	14.61
L2	3.55	4.05
Q	1.10	1.40
Q1	2.65	2.85



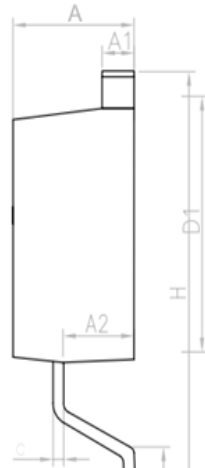
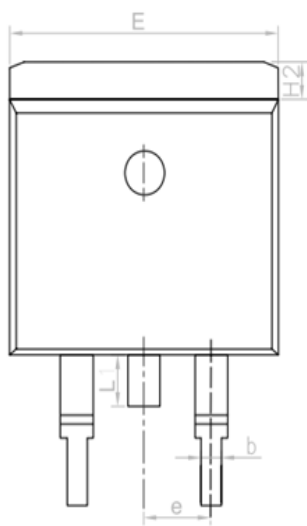




## 外形尺寸 PACKAGE MECHANICAL DATA

TO-263

单位 Unit: mm



SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70

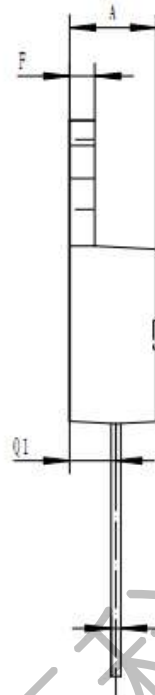
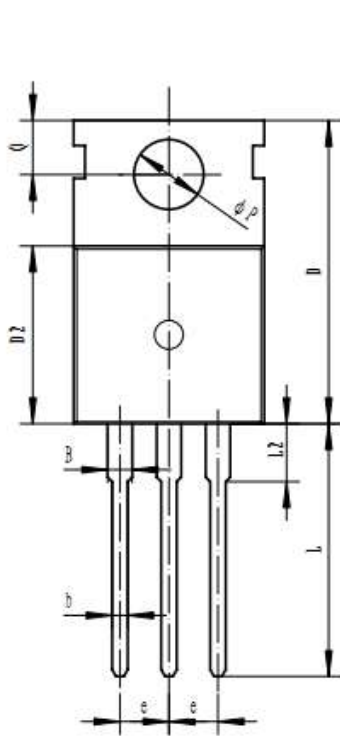




## 外形尺寸 PACKAGE MECHANICAL DATA

TO-220C

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.40
b	0.70	0.85
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80

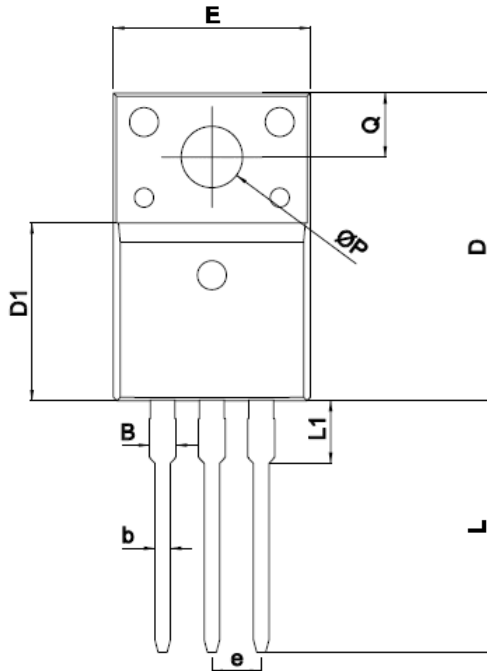




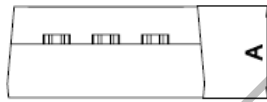
## 外形尺寸 PACKAGE MECHANICAL DATA

## TO-220MF

单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.47
b	0.7	0.9
c	0.45	0.60
D	15.67	16.07
D1	9.04	9.20
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.58	13.38
L1	3.13	3.33
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28



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