



# JCS15N70C

## 主要参数 MAIN CHARACTERISTICS

$I_D$	15.0 A
$V_{DSS}$	700 V
$R_{dson-max}$ (@ $V_{gs}=10V$ )	0.55 $\Omega$
$Q_g-typ$	44.6 nC

### 用途

- 高频开关电源
- 电子镇流器
- UPS 电源

### APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- UPS

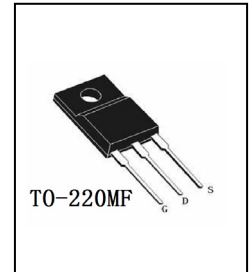
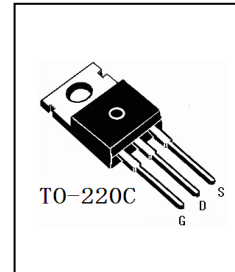
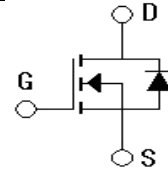
### 产品特性

- 低栅极电荷
- 低  $C_{rss}$  (典型值 10.79pF)
- 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  $C_{rss}$  (typical 10.79pF)
- 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
JCS15N70CC-O-C-N-B	JCS15N70C	TO-220C	否 NO	条管 Tube	2.15 g(typ)
JCS15N70FC-O-F-N-B	JCS15N70F	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	
		JCS15N70CC	JCS15N70FC		
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	700	700	V	
连续漏极电流 Drain Current -continuous	$I_D$	T=25℃	15.0	15.0*	A
		T=100℃	9.5	9.5*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	$I_{DM}$	60	60*	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)	$E_{AS}$	910		mJ	
雪崩电流 (注1) Avalanche Current (note 1)	$I_{AR}$	15.0		A	
重复雪崩能量 (注1) Repetitive Avalanche Energy (note 1)	$E_{AR}$	56.8		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	4.7		V/ns	
耗散功率 Power Dissipation	$P_D$ T <sub>C</sub> =25℃ -Derate above 25℃	568	62.5	W	
		4.5	0.5	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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	700	-	-	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 $25^\circ C$	-	0.64	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=700V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	10	$\mu A$
		$V_{DS}=560V, T_C=125^\circ C$	-	-	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7.5A$	-	0.45	0.55	$\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS}=40V, I_D=15A$ (note 4)	-	15.45	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	2185	2840	pF
输出电容 Output capacitance	$C_{oss}$		-	235	304	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	10.79	14.1	pF





## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	VDD=350V, ID=15A, RG=25Ω (note 4, 5)	-	52.8	66	ns
上升时间 Turn-On rise time	$t_r$		-	112	140	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	94.4	118	ns
下降时间 Turn-Off Fall time	$t_f$		-	43.2	54	ns
栅极电荷总量 Total Gate Charge	$Q_g$	V <sub>DS</sub> =560V , I <sub>D</sub> =15A V <sub>GS</sub> =10V (note 4, 5)	-	44.6	51.3	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	12.7	-	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	22	-	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>	-	-	15	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	60	A
正向压降 Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =15.0A	-	-	1.4	V
反向恢复时间 Reverse recovery time	$t_{rr}$	V <sub>GS</sub> =0V, I <sub>S</sub> =15.0A di/dt=100A/μs (note 4)	-	552	-	ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$		-	6.18	-	μC

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max		单 位 Unit
		JCS15N70CC	JCS15N70FC	
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.22	2.0	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	62.5	°C/W

注释:

- 1: 脉冲宽度由最高结温限制
- 2: L=7.5mH, I<sub>AS</sub>=15.0A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, 起始结温 T<sub>J</sub>=25°C
- 3: I<sub>SD</sub>≤15.0A, di/dt≤300A/μs, V<sub>DD</sub>≤BV<sub>DSS</sub>, 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:

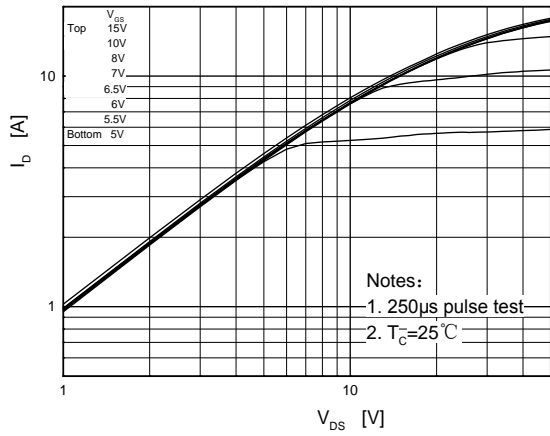
- 1: Pulse width by maximum junction temperature
- 2: L=7.5mH, I<sub>AS</sub>=15.0A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C
- 3: I<sub>SD</sub>≤15.0A, di/dt≤300A/μs, V<sub>DD</sub>≤BV<sub>DSS</sub>, Starting T<sub>J</sub>=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%
- 5: Essentially independent of operating temperature



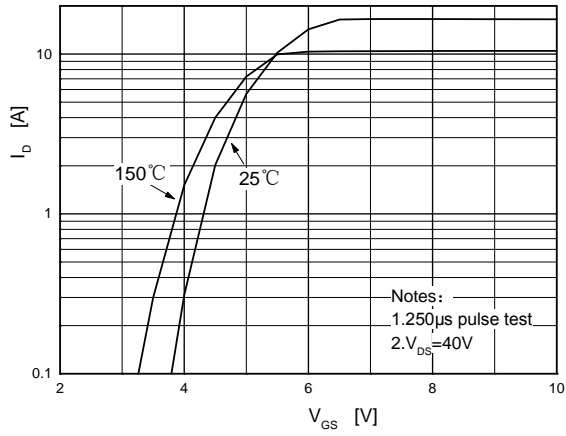


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

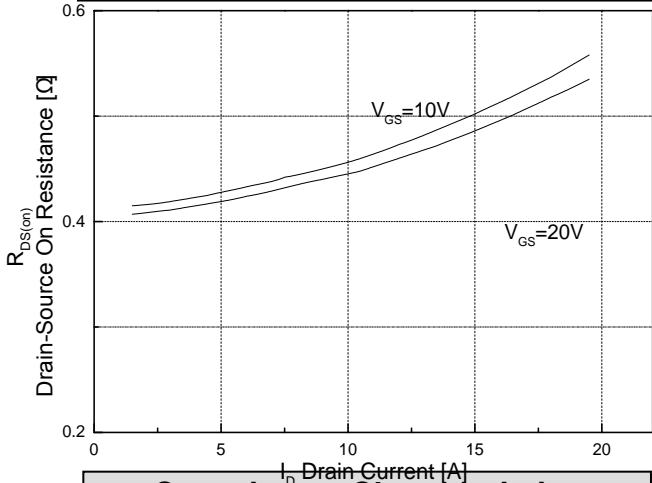
On-Region Characteristics



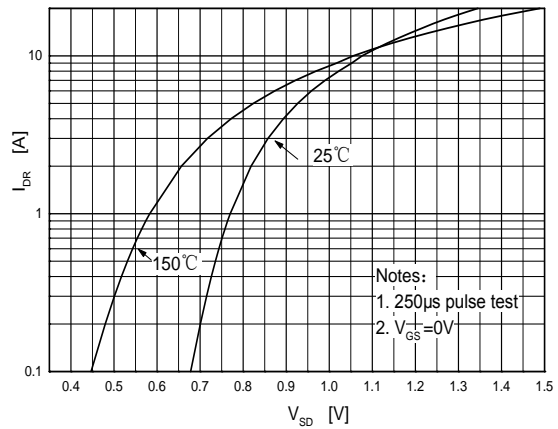
Transfer Characteristic



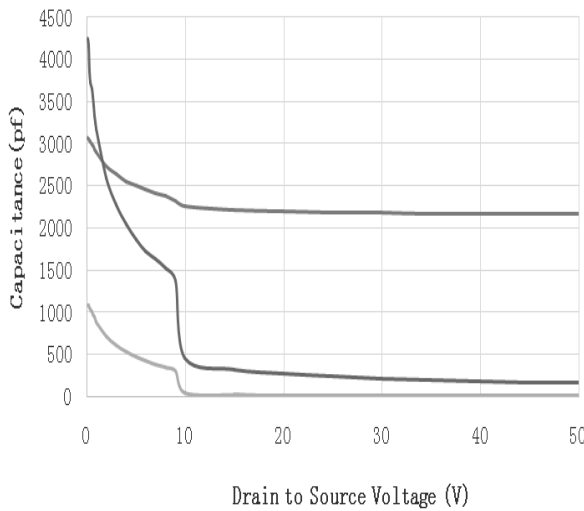
On-Resistance Variation vs. Drain Current and Gate Voltage



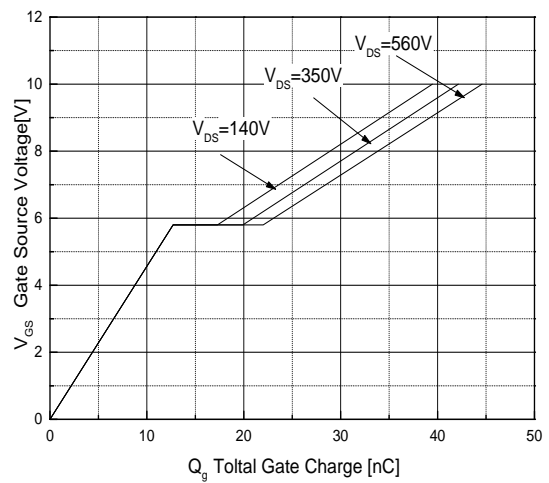
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



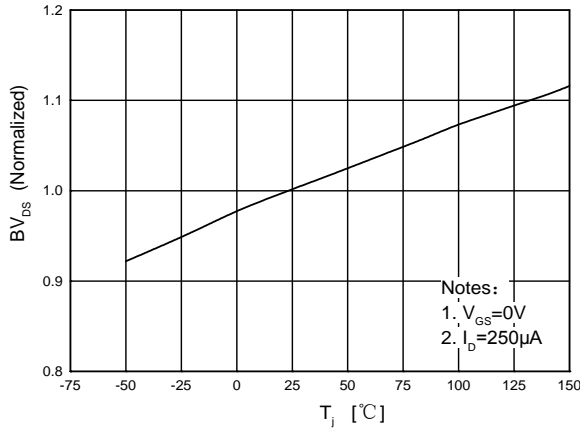
Gate Charge Characteristics



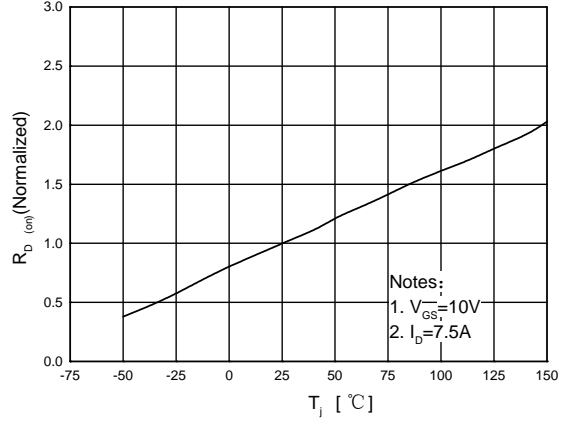


### 特征曲线 ELECTRICAL CHARACTERISTICS (curves)

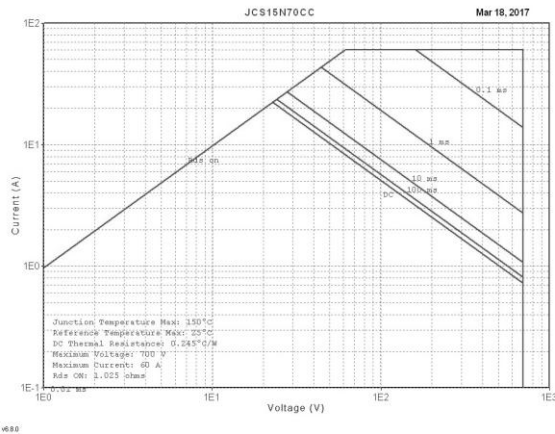
#### Breakdown Voltage Variation vs. Temperature



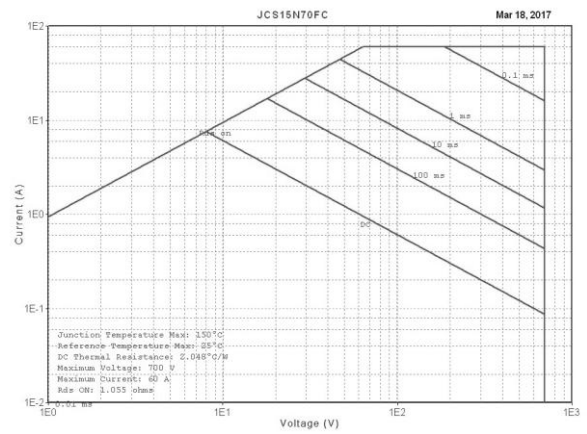
#### On-Resistance Variation vs. Temperature



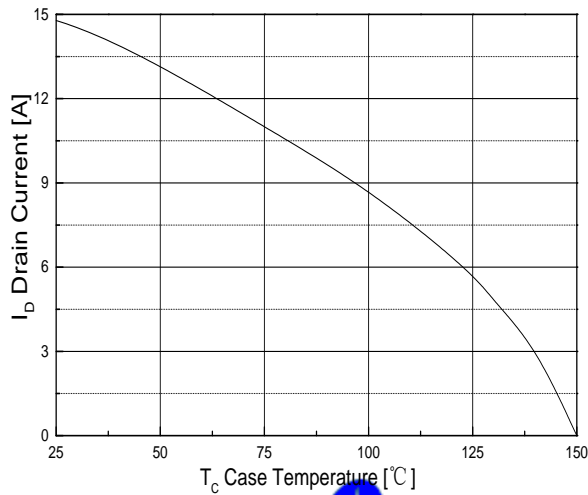
#### Maximum Safe Operating Area For JCS15N70CC



#### Maximum Safe Operating Area For JCS15N70FC

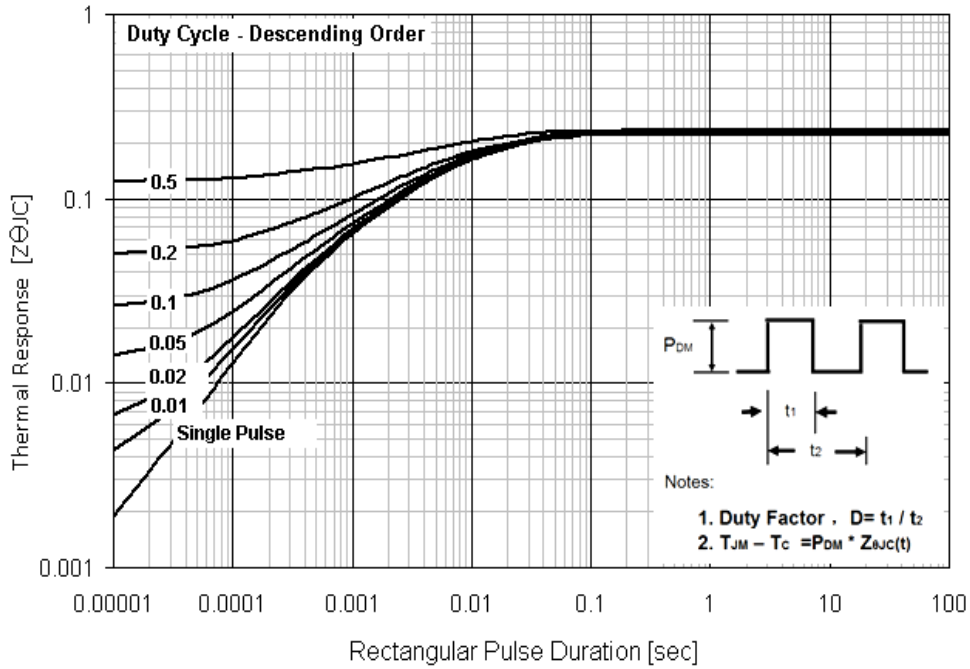


#### Maximum Drain Current vs. Case Temperature

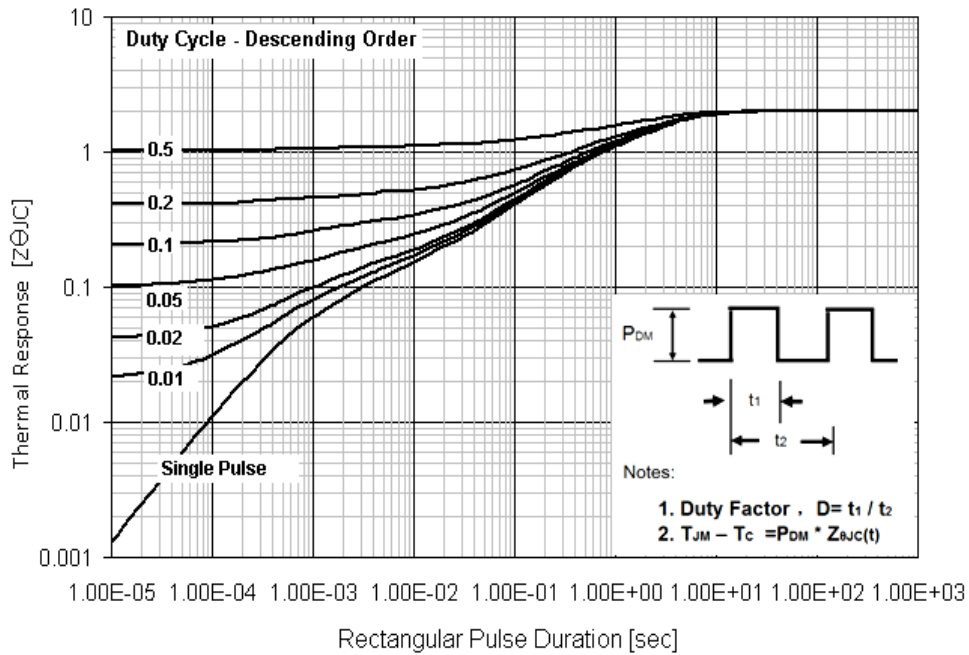




Transient Thermal Response Curve For JCS15N70CC



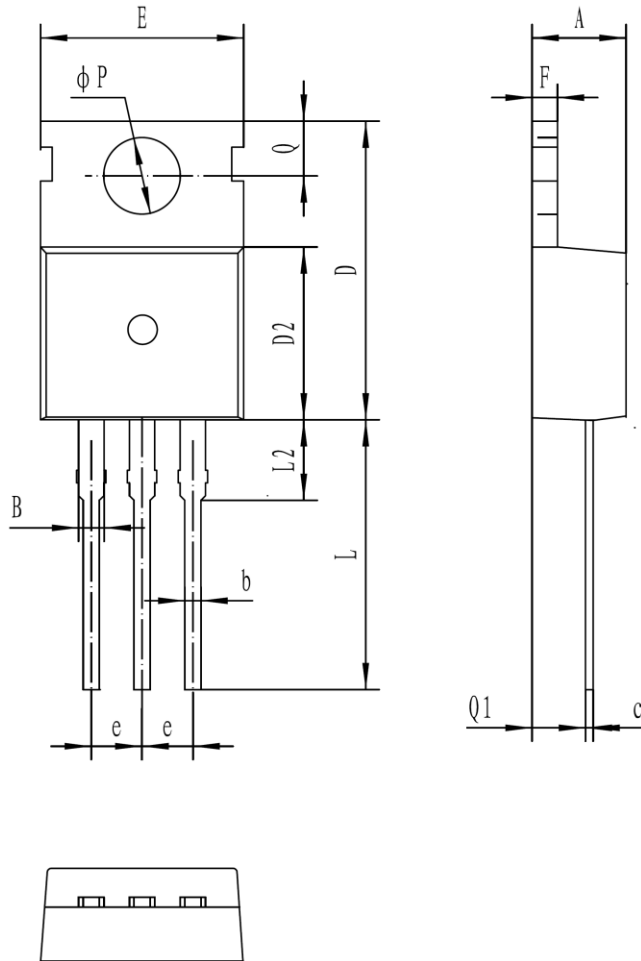
Transient Thermal Response Curve For JCS15N70FC





## TO-220C

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.47
b	0.70	0.95
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

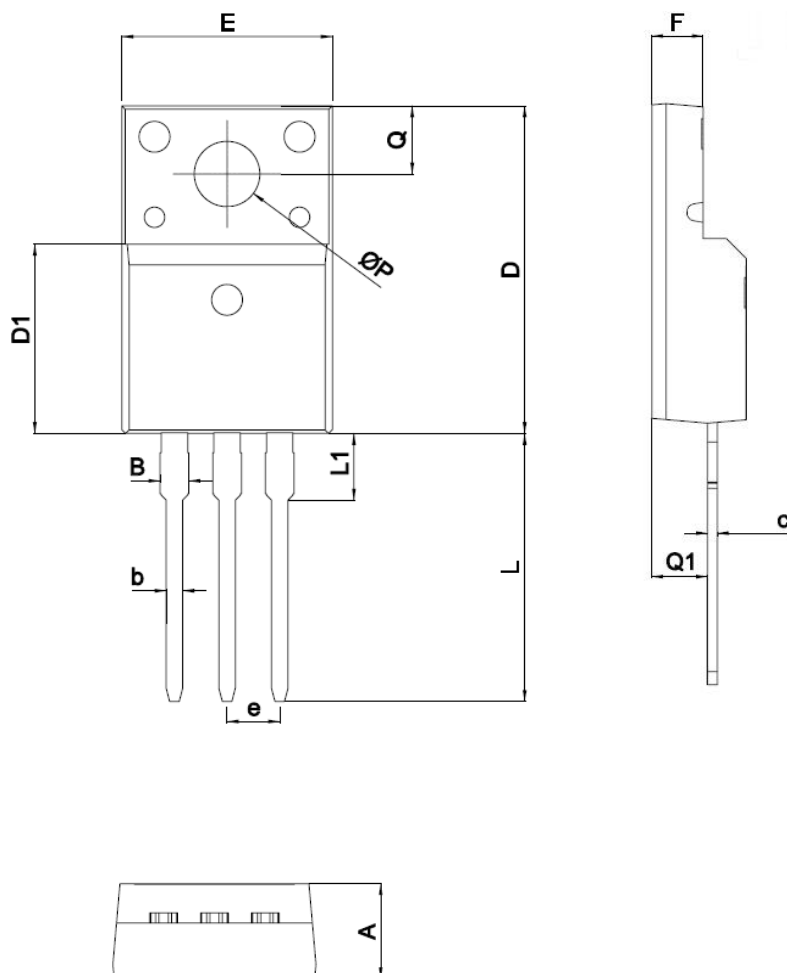






## TO-220MF

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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