

PHJCS3910

主要参数 MAIN CHARACTERISTICS

I_D	16A
V_{DSS}	100 V
$R_{dson-max}$ (@ $V_{gs}=10V$)	115 m Ω
Q_g-typ	18.9 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 90pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

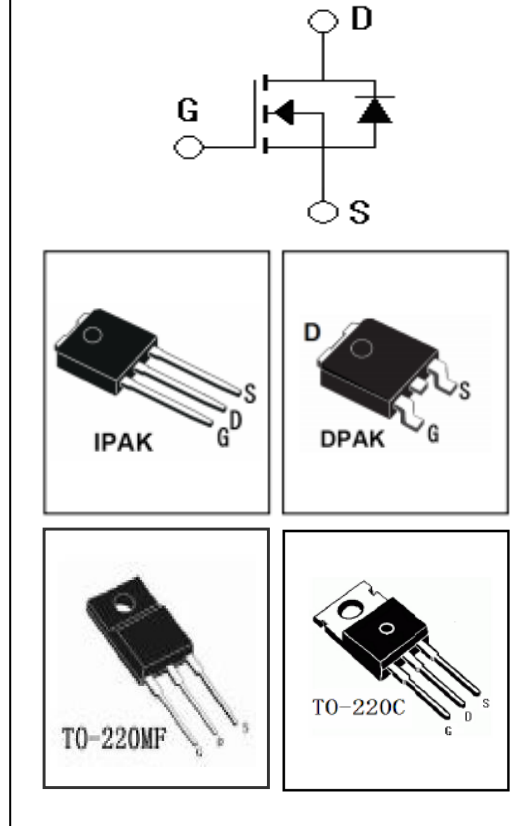
APPLICATIONS

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

FEATURES

- Low gate charge
- Low C_{rss} (typical 90pF)
- 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		
JCS3910V-V-B	JCS3910V-V-BR	N/A	N/A	JCS3910V	IPAK
JCS3910R-R-B	JCS3910R-R-BR	JCS3910R-R-A	JCS3910R-R-AR	JCS3910R	DPAK
JCS3910F-F-B	JCS3910F-F-BR	N/A	N/A	JCS3910F	TO-220MF
JCS3910C-C-B	JCS3910C-C-BR	N/A	N/A	JCS3910C	TO-220C

绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项 目 Parameter	符 号 Symbol	数 值 Value		单 位 Unit
		PHJCS3910V/R/C	PHJCS3910F	
最高漏极-源极直流电压 Drain-Source Voltage	V _{DSS}	100		V
连续漏极电流 Drain Current -continuous	I _D T=25℃	16*		A
	T=100℃	12*		A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	I _{DM}	64*		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}	153.6		mJ
雪崩电流 (注1) Avalanche Current (note 1)	I _{AR}	16		A
重复雪崩能量 (注1) Repetitive Avalanche Current (note 1)	E _{AR}	7.9		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	5.1		V/ns
MOSFET 最大电压变化速率 MOSFET dv/dt ruggedness	dv/dt	20.5		V/ns
耗散功率 Power Dissipation	P _D T _C =25℃ -Derate above 25℃	79	47	W
		0.53	0.31	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T _J , T _{STG}	-55~+175		℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T _L	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
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	100	-	-	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 $25^\circ C$	-	0.09	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V,$ $T_C=25^\circ C$	0	-	1	μA
		$V_{DS}=80V, T_C=125^\circ C$	0	-	10	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	0	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	0	-	-100	nA
通态特性 On-Characteristics						
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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=8.0A$	0	95	115	m Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS} = 40V, I_D=16.0A$ (note 4)	-	7.8	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	318	623	828	pF
输出电容 Output capacitance	C_{oss}		80	164	218	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		40	90	119	pF

电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=50V, I_D=16A, R_G=25\Omega$ (note 4, 5)	-	7.1	9.4	ns
上升时间 Turn-On rise time	t_r		-	31	41	ns
延迟时间 Turn-Off delay time	$t_d(\text{off})$		-	42	55	ns
下降时间 Turn-Off Fall time	t_f		-	24	31	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=80V,$ $I_D=16A$ $V_{GS}=10V$ (note 4, 5)	9	18.9	27	nC
栅-源电荷 Gate-Source charge	Q_{gs}		2	4.1	10	nC
栅-漏电荷 Gate-Drain charge	Q_{gd}		3	7.4	15	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	-	-	16	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	64	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V,$ $I_S=16A$	-	-	1.4	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=16A$ $di/dt=100A/\mu s$ (note 4)	-	127	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	710	-	nC

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max		单 位 Unit
		JCS3910V/R/C	JCS3910F	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	1.89	3.2	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	45.9	$^{\circ}C/W$

注释:

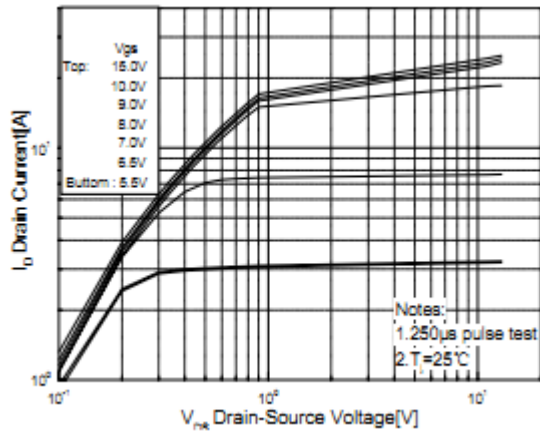
- 1: 脉冲宽度由最高结温限制
- 2: $L=1.2mH, I_{AS}=16A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 16A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

Notes:

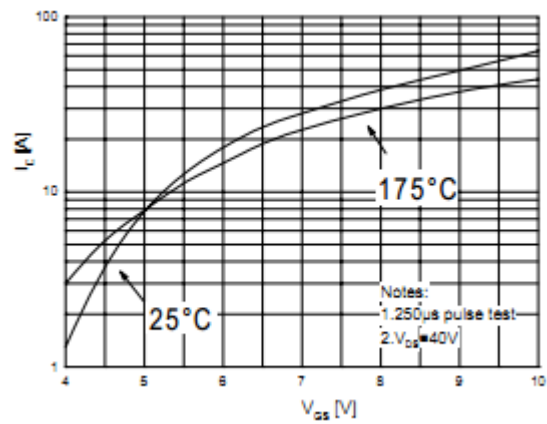
- 1: Pulse width limited by maximum junction temperature
- 2: $L=1.2mH, I_{AS}=16A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 16A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

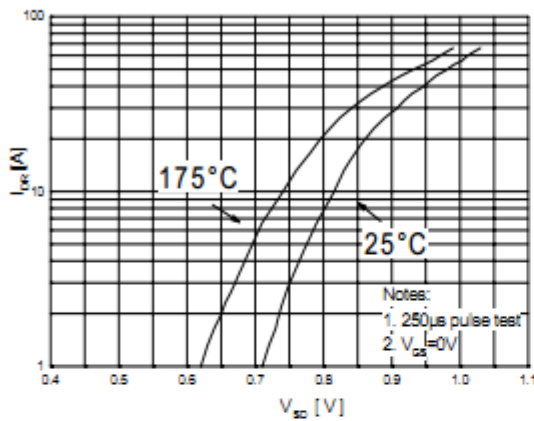
On-Region Characteristics



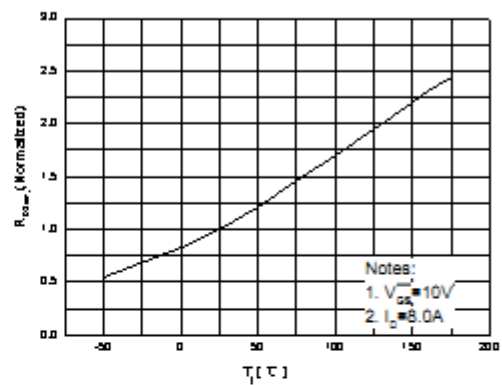
Transfer Characteristics



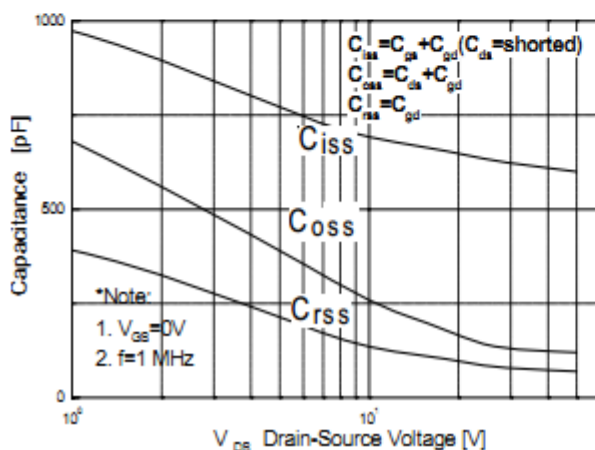
Body Diode Forward Voltage Variation vs. Source Current and Temperature



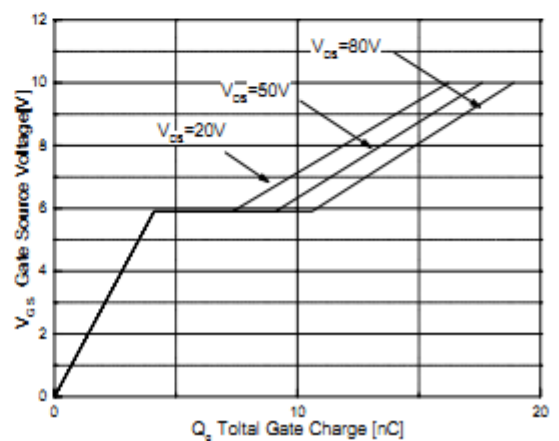
On-Resistance Variation vs. Temperature



Capacitance Characteristics

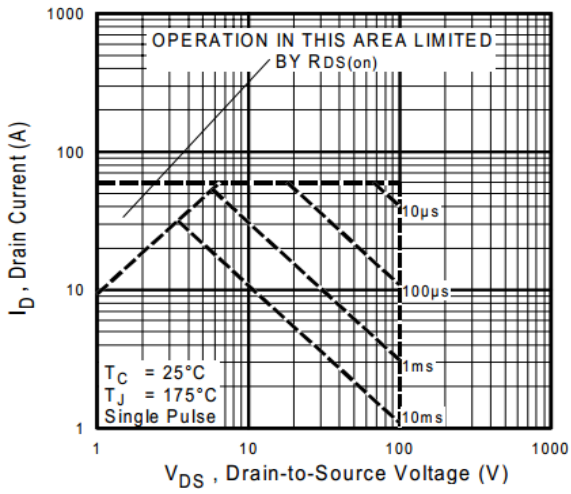


Gate Charge Characteristics

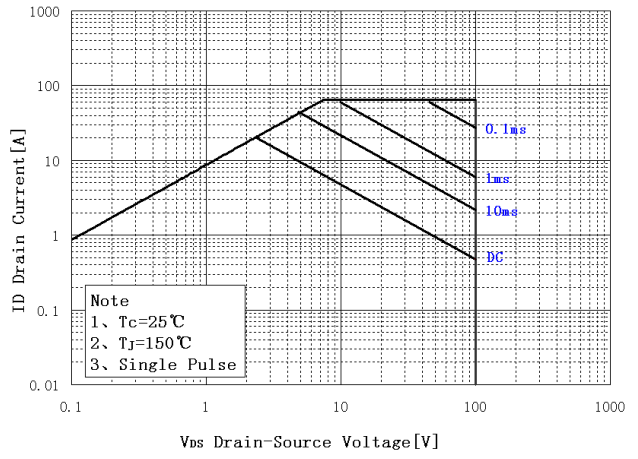


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

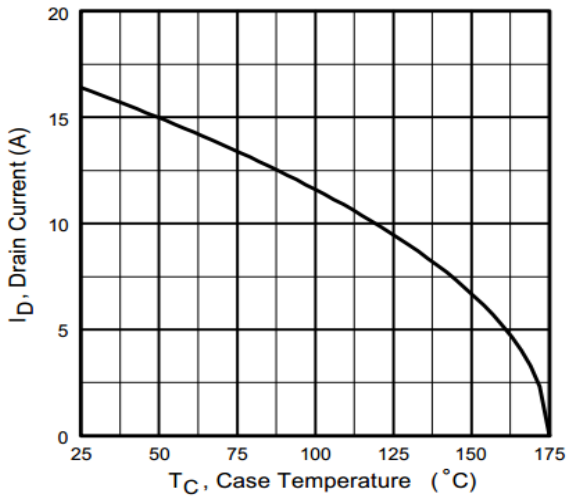
Maximum Safe Operating Area (PHJCS3910V/R/C)



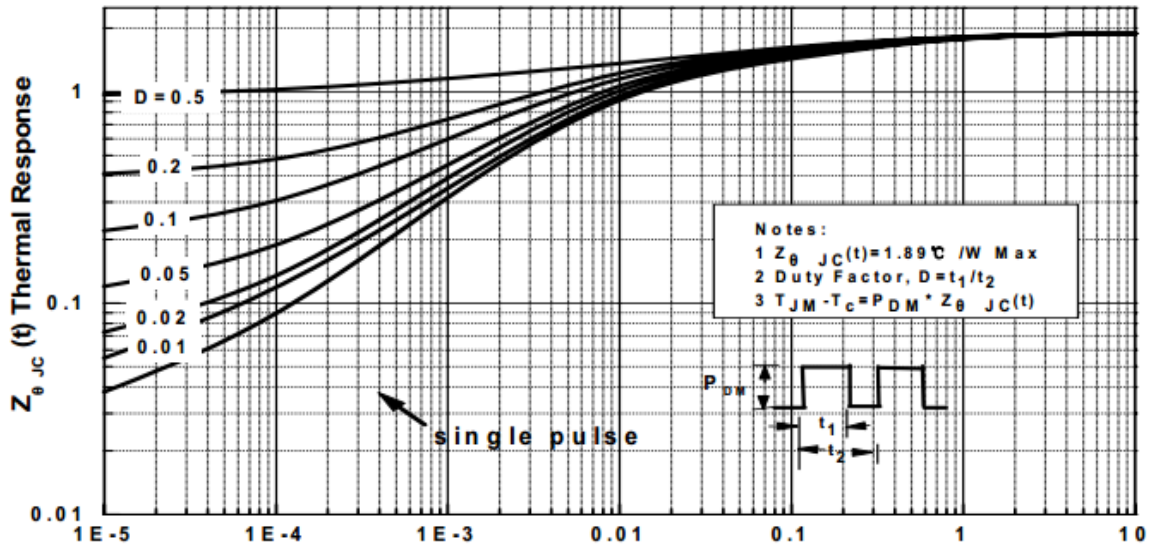
Maximum Safe Operating Area (PHJCS3910F)



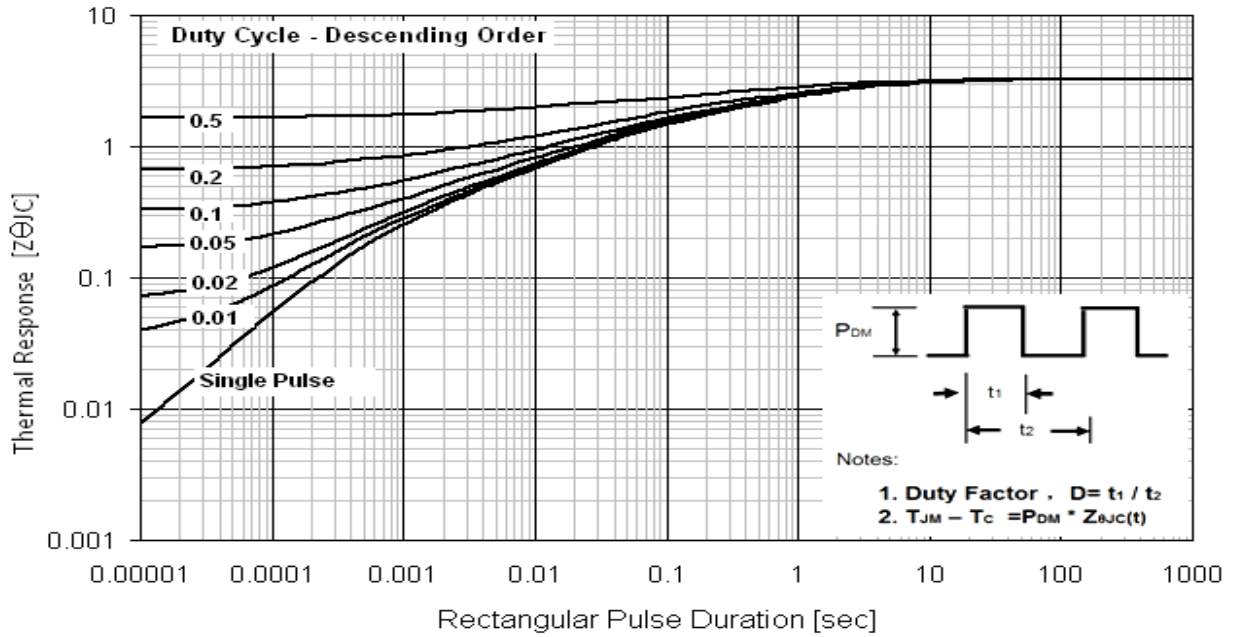
Maximum Drain Current vs. Case Temperature



**Transient Thermal Response Curve
(PHJCS3910V/R/C)**



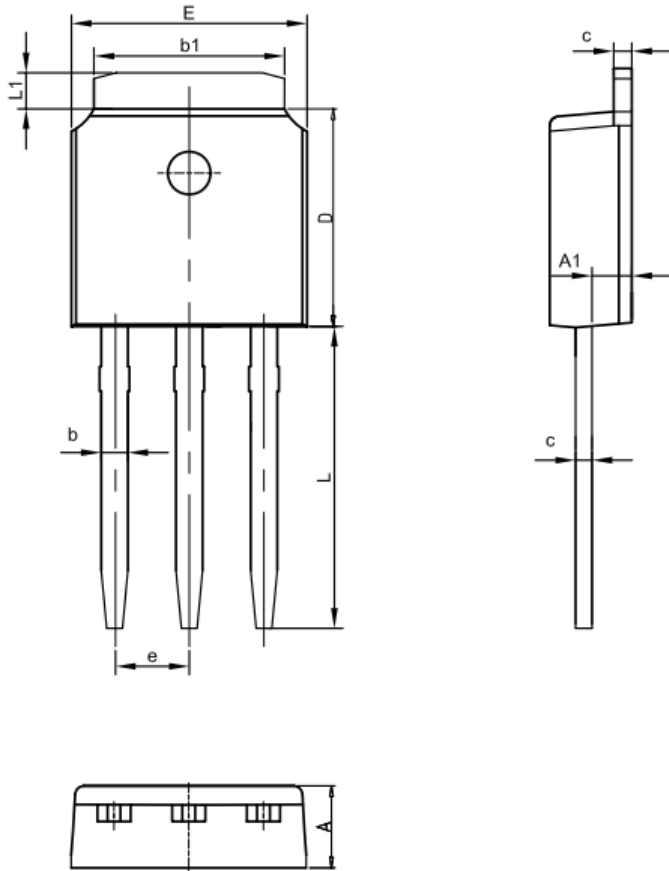
**Transient Thermal Response Curve
(PHJCS3910F)**



外形尺寸 PACKAGE MECHANICAL DATA

IPAK

单位 Unit: mm

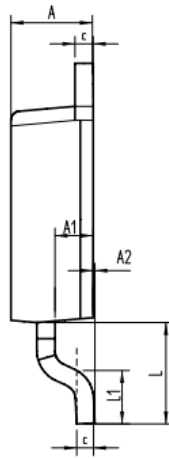
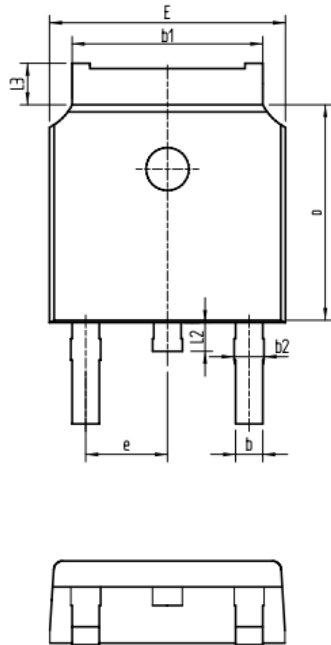


SYMBOL	MM	
	MIN	MAX
A	2.1	2.5
A1	0.87	1.27
b	0.63	0.93
b1	5.13	5.53
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
L	9.10	9.70
e	2.286BSC	
L1	0.82	1.22

外形尺寸 PACKAGE MECHANICAL DATA

DPAK

单位 Unit: mm

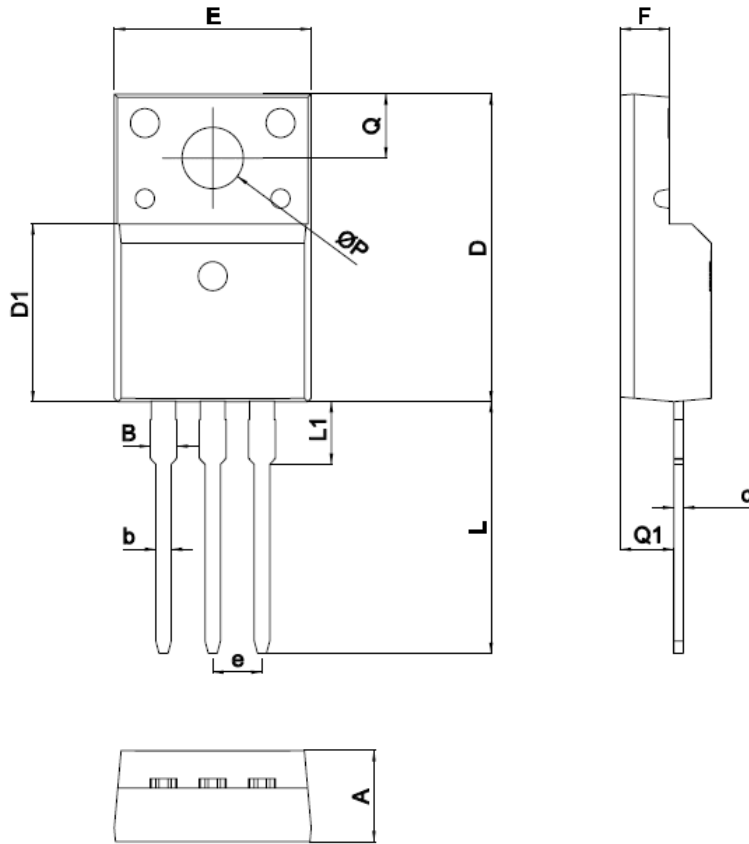


SYMBOL	mm	
	MIN	MAX
A	2.16	2.41
A1	0.97	1.17
A2	0.00	0.15
b	0.63	0.93
b1	5.13	5.53
b2	0.66	0.96
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30

外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF

单位 Unit: mm

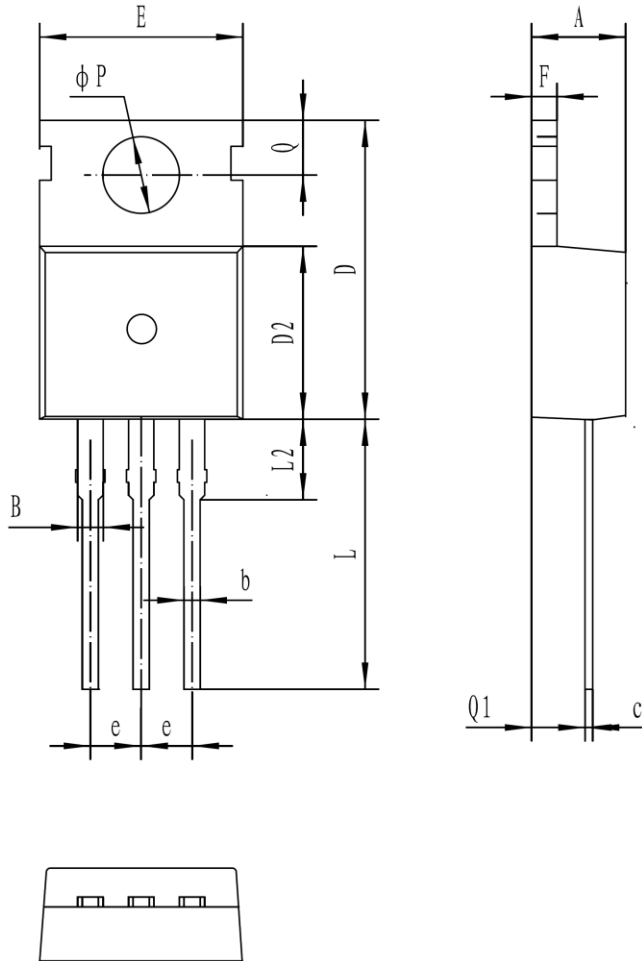


SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.47
b	0.7	0.9
c	0.45	0.60
D	15.67	16.07
D1	9.04	9.20
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.58	13.38
L1	3.13	3.33
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28

外形尺寸 PACKAGE MECHANICAL DATA

TO-220C

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.10	1.40
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