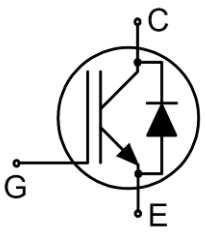
TP015N120CA

主要参数 MAIN CHARACTERISTICS

I_C	15 A
V_{CES}	1200 V
Vcesat_typ （Vge=15V）	1.7V

封装 **Package**



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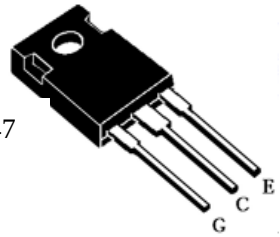


用途

- 逆变器
- 电磁炉
- UPS 电源

APPLICATIONS

- General purpose inverters
- Induction heating(IH)
- UPS

产品特性

- 低栅极电荷
- FS 技术
- 通态压降, VCE(sat), typ = 1.7V IC = 15A and TC = 25°C
- RoHS 产品

FEATURES

- Low gate charge
- FS Technology
- saturation voltage: VCE(sat), typ = 1.7V IC = 15A and TC = 25°C
- RoHS product

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		
TP015N120CA-GE-B	TP015N120CA-GE-BR	N/A	N/A	TP015N120CA	TO-247

绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项 目 Parameter	符 号 Symbol	数 值 Value TP015N120CA	单位 Unit
最高集电极－发射极直流电压 Collector-Emmiter Voltage	V_{ces}	1200	V
连续集电极极电流 Collector Current-continuous	I_C T=25℃	30	A
	I_C T=100℃	15	A
最大脉冲集电极极电流（注 1） Collector Current – pulse （note 1）	I_{CM}	45	A
二极管正向电流 Diode forward current	I_F T=25℃	30	A
	I_F T=100℃	15	A
二极管正向脉冲电流 Diode pulse current	I_{FSM}	45	A
最高栅极发射极电压 Gate-Emmiter Voltage	V_{GES}	±20	V
安全工作区 Turn-off safe area	-	45	A
耗散功率 Power Dissipation	P_D T_C=25℃	200	W
存储温度 Storage Temperature Range	T_{STG}	-55～+150	℃
结温 Junction Temperature Range	T_J	-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

*Collector 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						
集电极－发射极击穿电压 Collector-Emmiter Voltage	BV_{CES}	I_C=1mA, V_{GE}=0V	1200	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	I_C=1mA, referenced to 25℃	-	0.6	-	V/℃
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_C=25℃	-	-	0.2	mA
		T_C=100℃			1	mA
		T_C=175℃	-	-	2	mA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GESF}	V_{CE}=0V,　V_{GE} =20V	-	-	200	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GESR}	V_{CE}=0V,　V_{GE} =-20V	-	-	-200	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GE(th)}$	V_{CE} = V_{GE},　I_C=600μA	4.5	-	6.5	V
饱和压降 Collector-Emmiter saturation Voltage	V_{CESAT}	V_{GE}=15V I_C=15A Tc=25℃	-	1.7	2.5	V
		V_{GE}=15V I_C=15A Tc=125℃	-	1.9	-	V
		V_{GE}=15V I_C=15A Tc=175℃	-	2.1	-	V
短路电流（注 2） Short Collector current（Note 2）	Isc	V_{GE}=15V　V_{CE}=600V T_{Jstart}≤175°C,t≤10μs	-	120	-	A
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	V_{CE}=25V, V_{GE}=0V, f=1.0MHz	-	1330	-	pF
输出电容 Output capacitance	C_{oes}		-	100	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	70	-	pF
栅极电荷总量 Total Gate Charge	Q_g	V_{CE} =600V ,　I_C=15A V_{GE}=15V　（note 3）	-	100		nC

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
开关特性 Switching Characteristics						
开启延迟时间 Turn-On delay time	$t_d(on)$	V_{CE}=600V,I_c=15A,R_G=10Ω T_C=25℃　Inductive Load	-	80	-	ns
上升时间 Turn-On rise time	t_r		-	65	-	ns
关断延迟时间 Turn-Off delay time	$t_d(off)$		-	180	-	ns
下降时间 Turn-Off Fall time	t_f		-	80	-	ns
开启损耗 Turn-on energy	E_{on}			2.0	-	mJ
关断损耗 Turn-off energy	E_{off}			0.9	-	mJ
总的开关损耗 Total switching energy	E_{total}			2.9	-	mJ
开启延迟时间 Turn-On delay time	$t_d(on)$	V_{CE}=600V,I_c=15A,R_G=10Ω T_C=175℃　Inductive Load	-	78	-	ns
上升时间 Turn-On rise time	t_r		-	63	-	ns
关断延迟时间 Turn-Off delay time	$t_d(off)$		-	202	-	ns
下降时间 Turn-Off Fall time	t_f		-	115	-	ns
开启损耗 Turn-on energy	E_{on}		-	2.3	-	mJ
关断损耗 Turn-off energy	E_{off}		-	1.4	-	mJ
总的开关损耗 Total switching energy	E_{total}		-	3.7	-	mJ
反并联二极管特性及最大额定值 **Anti-Parallel Diode Characteristics and Maximum Ratings**						
正向压降 Drain-Source Diode Forward Voltage	V_F	V_{GE}=0V,　I_F=15A T_C=25℃	-	1.8	2.6	V
		V_{GE}=0V,　I_F=15A T_C=175℃	-	1.5	-	V
反向恢复时间 Diode Reverse recovery time	t_{rr}	V_{GE}=0V, V_R=600V I_F=15A dI_F/dt=200A/μs T_C=25℃	-	309	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	1.4	-	μC
反向恢复电流 Diode Reverse recovery Current	I_{RRM}		-	7.3	-	A
反向恢复时间 Diode Reverse recovery time	t_{rr}	V_{GE}=0V, VR=600V I_F=20A dI_F/dt=200A/μs T_C=175℃	-	539	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	4.5	-	μC
反向恢复电流 Diode Reverse recovery Current	I_{RRM}		-	15.6	-	A

热特性 THERMAL CHARACTERISTIC

项　　目 **Parameter**	符　号 **Symbol**	最大 **Max**	单 位 **Unit**
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.6	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	℃/W

注释：

1：脉冲宽度由最高结温限制

2：两次短路之间的间隔大于 1 秒时，允许短路测试的次数最大为 1000 次

3：脉冲测试：脉冲宽度≤300μs,占空比≤2％

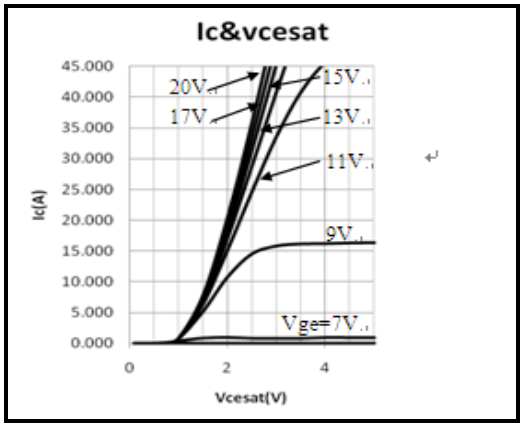
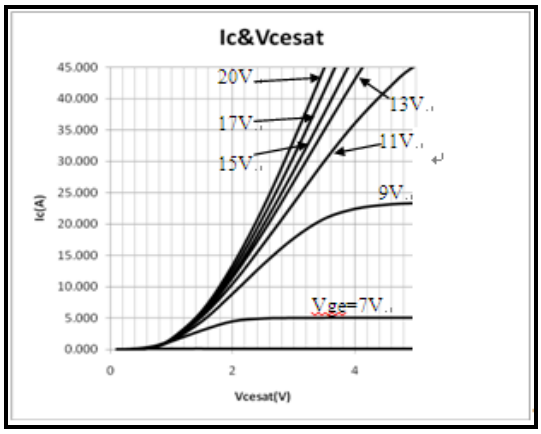
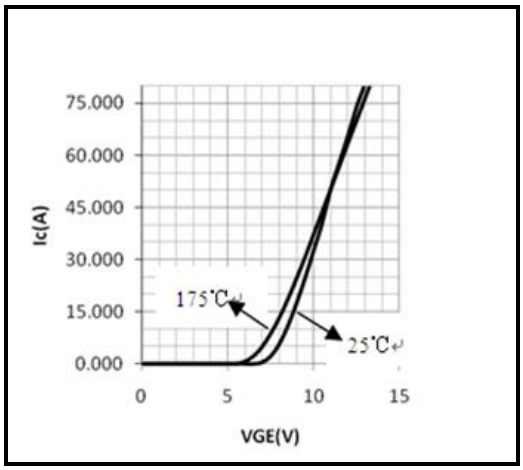
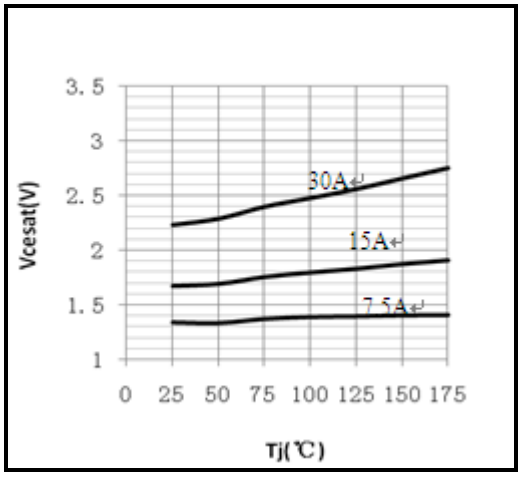
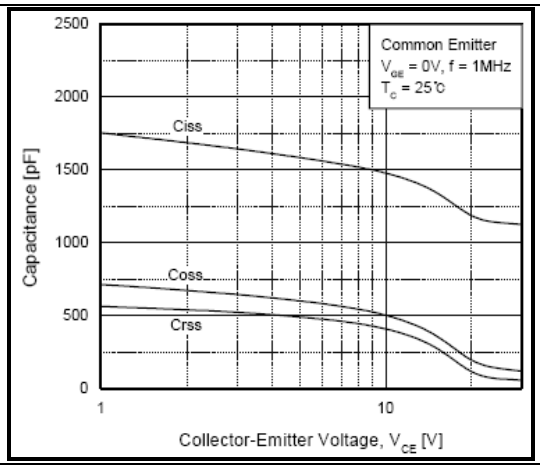
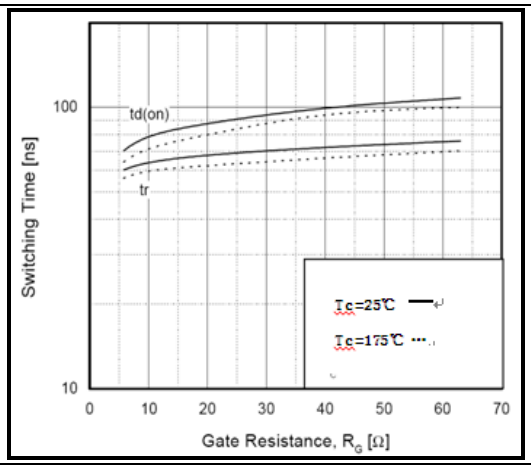
Notes:

1：Pulse width limited by maximum junction temperature

2：Allowed number of short circuits: <1000; time between short circuits: >1s.

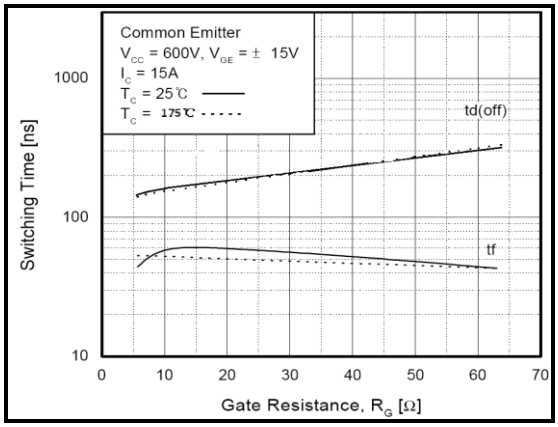
3：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2％

特征曲线　ELECTRICAL CHARACTERISTICS (curves)

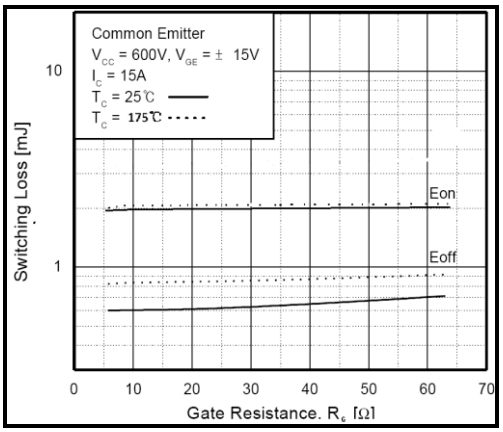
Output Characteristics（25℃）	Output Characteristics（175℃）
	
Transfer Characteristics	**Vcesat vs. Tj**
	
Capacitance Characteristics	**Turn-On Characteristics vs. Gate Resistance**
	

Switching Time vs. Rg

VGE=15V,VCE=600V, IC=15A

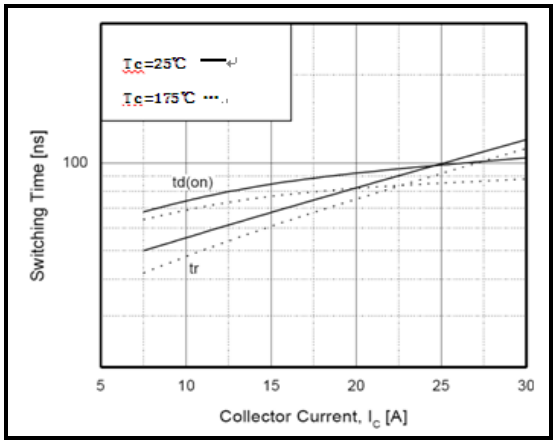


Switching Loss vs. Gate Resistance

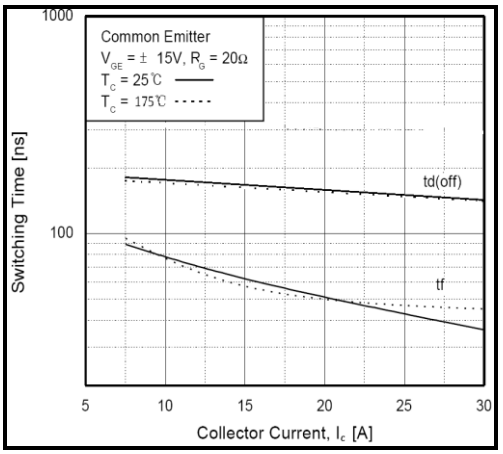


Turn-On Characteristics vs Ic

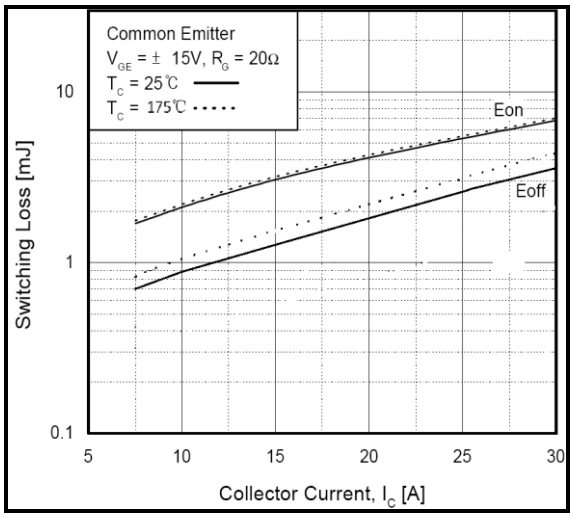
VCE=600V,VGE=15V, RG=10Ω



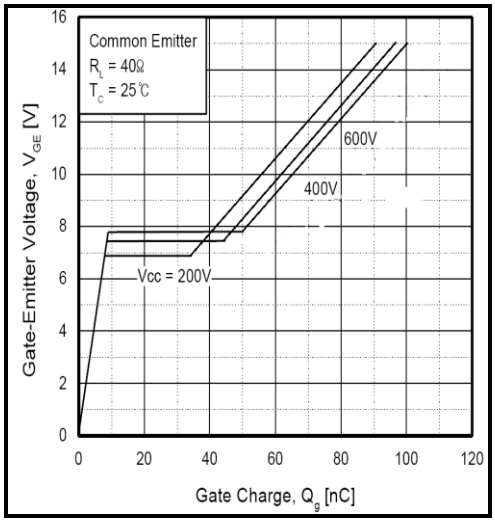
Turn-Off Characteristics vs Ic



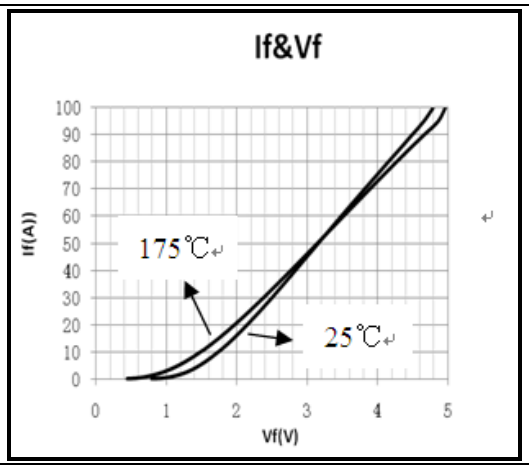
Switching Loss vs Ic



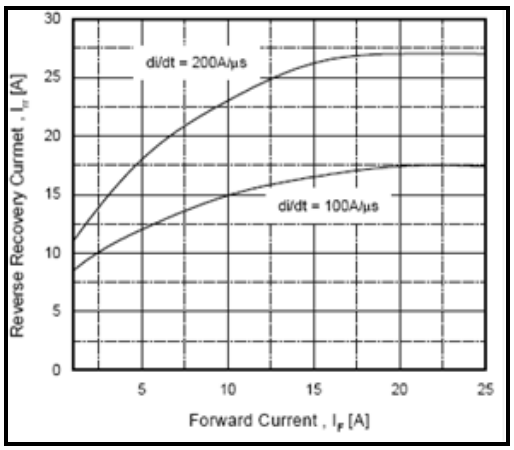
Gate Charge Characteristics



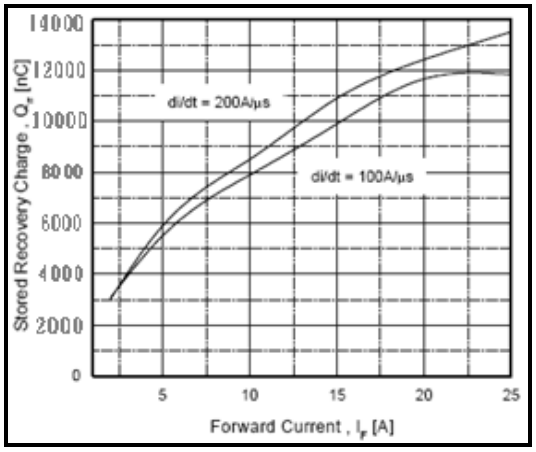
Forward Characteristics



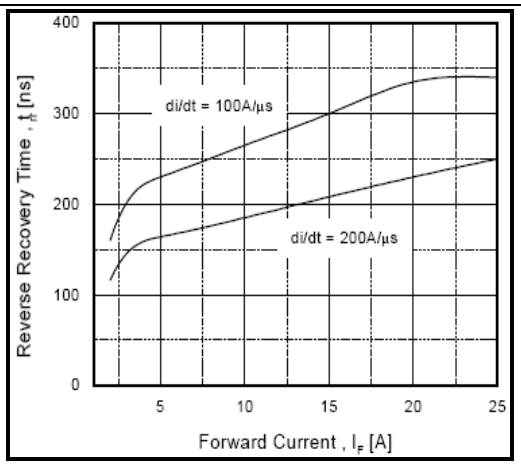
Reverse Recovery Current



Stored Charge

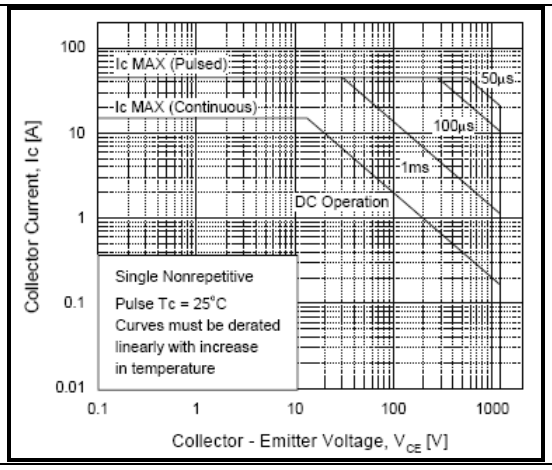


Reverse Recovery Time

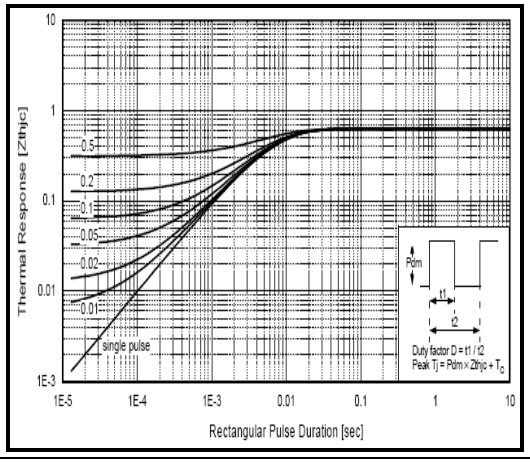


Forward Bias SOA

Tc=25°C, VGE=15V, Tj≤175°C



Transient Thermal Impedance



外形尺寸 PACKAGE MECHANICAL DATA

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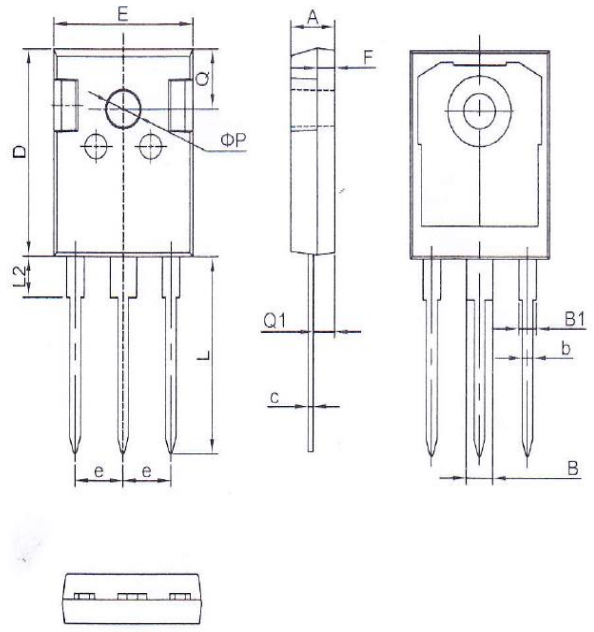
单位 Unit：mm



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

1.吉林华微电子股份有限公司的产品销售分为直销和销售代理，无论哪种方式，订货时请与公司核实。

2.购买时请认清公司商标，如有疑问请与公司本部联系。

3.在电路设计时请不要超过器件的绝对最大额定值，否则会影响整机的可靠性。

4.本说明书如有版本变更不另外告知

NOTE

1. Jilin Sino-microelectronics co., Ltd sales its product either through direct sales or sales agent , thus, for customers, when ordering , please check with our company.
2. We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.
3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
4. Jilin Sino-microelectronics co., Ltd reserves the right to make changes in this specification sheet and is subject to change without prior notice.

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