



JT450N120F2MH1E

主要参数 MAIN CHARACTERISTICS

I_c	450 A
V_{CES}	1200 V
V_{cesat_typ} ($V_{ge}=15V$)	1.8V

用途

- 电机驱动
- 伺服驱动
- UPS 电源
- 风力发电

产品特性

- 低栅极电荷
- FS 技术
- 低通态压降, $V_{CE(sat)}$,
typ = 1.8V, $I_c = 450A$
and $TC = 25^\circ C$
- RoHS 产品

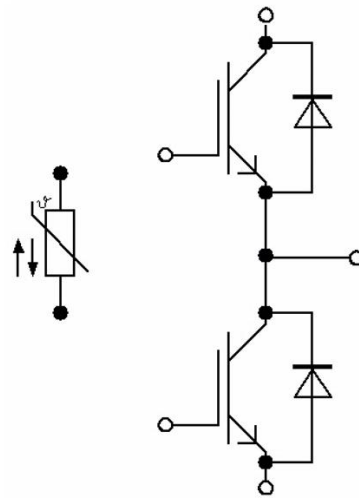
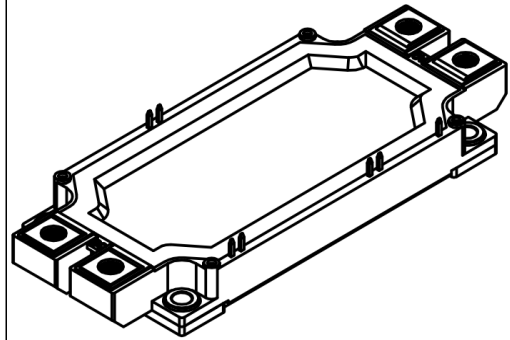
APPLICATIONS

- Motor Drives
- Servo Drives
- UPS System
- Wind Turbines

FEATURES

- Low gate charge
- FS Technology
- Low saturation voltage:
 $V_{CE(sat)}$, typ = 1.8V, $I_c =$
450A and $TC = 25^\circ C$
- RoHS product

封装 Package



订货信息 ORDER MESSAGE

订货型号 Order codes	印记 Marking	封装 Package	包装 Packaging	器件重量 Device Weight
JT450N120F2MH1E	JT450N120F2MH1E	两单元模块	盒装	345g(typ)



JT450N120F2MH1E

绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		JT450N120F2MH1E	
最高集电极—发射极直流电压 Collector-Emmitter Voltage	V_{ces}	1200	V
连续集电极极电流 Collector Current-continuous	I_c T=25°C T=100°C	700	A
		450	A
最大脉冲集电极极电流 (注 1) Collector Current – pulse (note 1)	I_{CM}	900	A
最高栅极发射极电压 Gate-Emmitter Voltage	V_{GES}	±20	V
短路时间 short circuit time	tsc	10	µs
耗散功率 Power Dissipation	P_D T _C =25°C	2250	W
结温范围 Junction Temperature	Tvjmax	175	°C
	Tvj op	-40~+150	
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	°C

*漏极电流由最高结温限制

*Collector current limited by maximum junction temperature



JT450N120F2MH1E

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-Emmitter Voltage	BV_{CES}	$I_C=17mA, V_{GE}=0V$	1200	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=17mA$, referenced to $25^\circ C$	-	0.6	-	$V/^\circ C$
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V,$ $T_C=25^\circ C$	-	-	0.1	mA
		$T_C=100^\circ C$	-	-	2	mA
		$T_C=150^\circ C$	-	-	3	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-Emmitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=17mA$	5.3	-	6.3	V
饱和压降（模块） Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=450A$ $T_C=25^\circ C$ $T_C=125^\circ C$ $T_C=150^\circ C$	-	1.8 2.1 2.2	2.3	V
短路电流（注2） Short Collector current（Note 2）	$I_{C(SC)}$	$V_{GE}=15V, V_{CE}=600V, t_{SC} < 10\mu s, T_C=25^\circ C$	-	2300	-	A
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	57.5	-	nF
输出电容 Output capacitance	C_{oes}		-	2.1	-	nF
反向传输电容 Reverse transfer capacitance	C_{res}		-	1.0	-	nF





电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics							
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CE}=600V,$ $I_C=450A,$ $R_G=1.5\Omega$ Inductive Load	$T_C=25^\circ C$	-	275	-	ns
上升时间 Turn-On rise time	t_r		$T_C=25^\circ C$	-	66	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		$T_C=25^\circ C$	-	357	-	ns
下降时间 Turn-Off Fall time	t_f		$T_C=25^\circ C$	-	113	-	ns
开启损耗 Turn-on energy	E_{on}		$T_C=25^\circ C$	-	10.6	-	mJ
关断损耗 Turn-off energy	E_{off}		$T_C=25^\circ C$	-	32	-	mJ
总的开关损耗 Total switching energy	E_{total}		$T_C=25^\circ C$	-	42.6	-	mJ
栅极电荷总量 Total Gate Charge	Q_g		$V_{CE}=600V, I_C=450A$ $V_{GE}=15V$ (note 3, 4)	-	3.1	-	μC
内部栅极电阻 Internal gate resistance	R_{Gint}			2.5		Ω	
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 Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=450A$	-	1.7	2.1	V	
峰值反向恢复电流 Peak Reverse recovery current	I_{RM}	$V_{GE}=0V, V_R=600V I_F=450A$ $di_F/dt=3800A/\mu s$		450		A	
反向恢复时间 Diode Reverse recovery time	t_{rr}		-	195	-	ns	
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	54	-	μC	
反向恢复能量 Reverse recovery energy	E_{rec}			23		mJ	

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 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 4: 基本与工作温度无关

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 $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 4: Essentially independent of operating temperature

**热特性 THERMAL CHARACTERISTIC**

项 目 Parameter		符 号 Symbol	最小 Min	典型 typ	最大 Max	单 位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Per/IGBT	$R_{th(j-c)}$	-	-	0.066	$^{\circ}C/W$
管壳到散热底座的热阻 Thermal Resistance, Case to heatsink	Per/IGBT	$R_{th(c-h)}$	-	0.03	-	$^{\circ}C/W$
结到管壳的热阻 Thermal Resistance, Junction to Case	Per/FRED	$R_{th(j-c)}$	-	-	0.1	$^{\circ}C/W$
管壳到散热底座的热阻 Thermal Resistance, Case to heatsink	Per/FRED	$R_{th(c-h)}$	-	0.045	-	$^{\circ}C/W$

热敏电阻特性 NTC Thermistor Characteristics

项 目 Parameter		符号 Symbol	最小 Min	典型 Typ	最大 Max	单位 Unit
额定电阻值 Rated resistance	-	$R_{25^{\circ}C}$	4.75	5	5.25	kohm
时间常数	静止空气中	τ	-	-	10	Sec
最大额定功率	-	P_{max}	-	-	10	mW
B-值 B-value	$B = [(T_a \times T_b) / (T_b - T_a)] \times \ln(R_a / R_b)$ $T_b = 50^{\circ}C \pm 0.01^{\circ}C$	$B_{25/50}$	3346.2	3380	3413.8	K
工作温度	-	-	-50	-	200	$^{\circ}C$



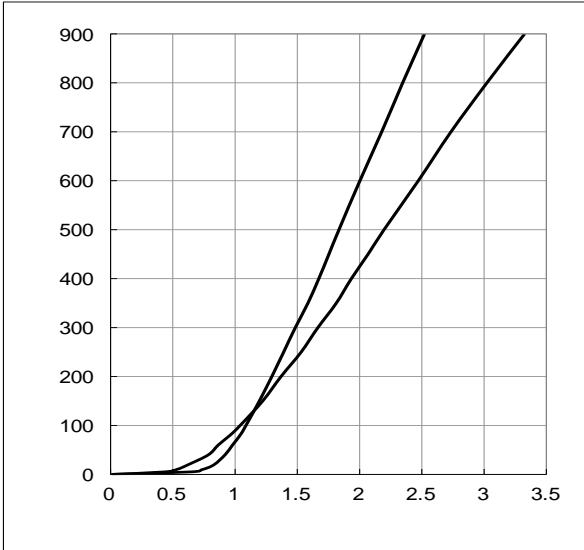


机械性能 Mechanical Characteristics

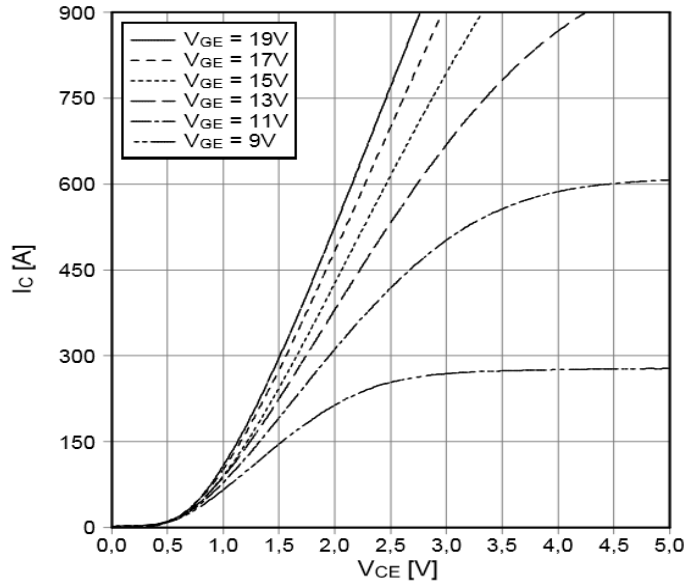
项目 Item	符号 Symbol	测试条件 Conditions	数值 Values			单位 Unit
			最小 Min	典型 typ	最大 Max	
安装扭矩 Mounting torque	Mt	Main terminals,M6 screw	3	-	6	Nm
安装扭矩 Mounting torque	Ms	Mounting to heat sink,M5 screw	3	-	6	Nm
爬电距离 Creepage distance	ds	Terminal to terminal	11.55	-	-	mm
		Terminal to base plate	12.32	-	-	
空隙 Clearance		Terminal to terminal	10	-	-	mm
		Terminal to base plate	10.85	-	-	
重量 Weight		-	-	345	-	g



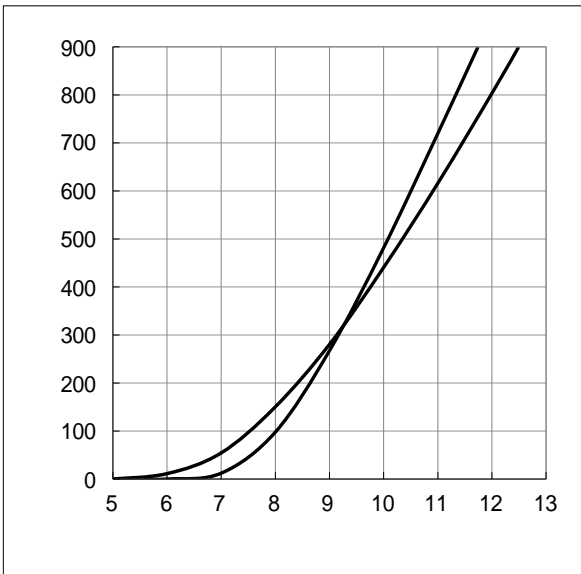
Typical Output Characteristics($V_{GE}=15V$)



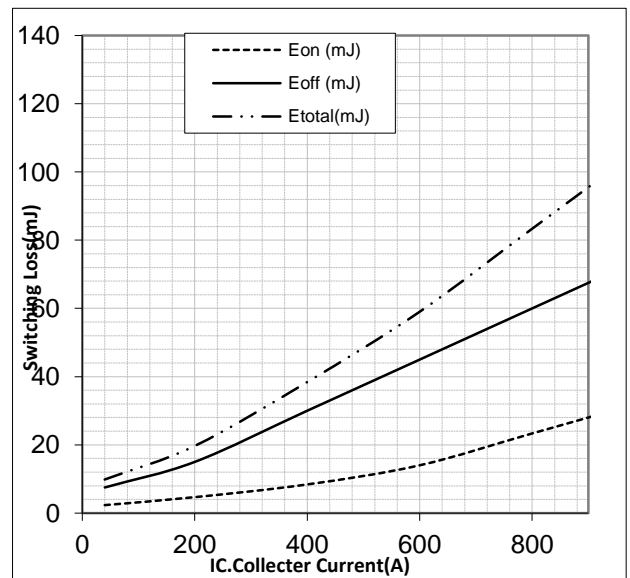
Typical Output Characteristics($T_j=150^{\circ}C$)



Typical Saturation Voltage Characteristics

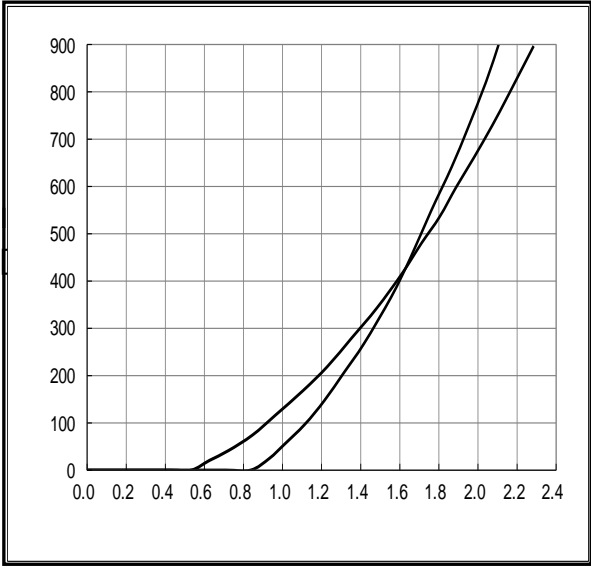


Switching Loss vs. Collector Current ($R_g=1.5\Omega$, $V_{GE}=15V$, $T_{vj}=25^{\circ}C$)

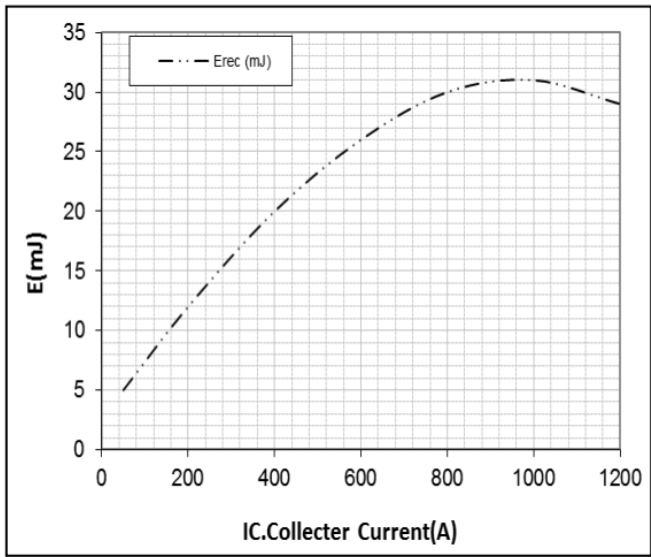




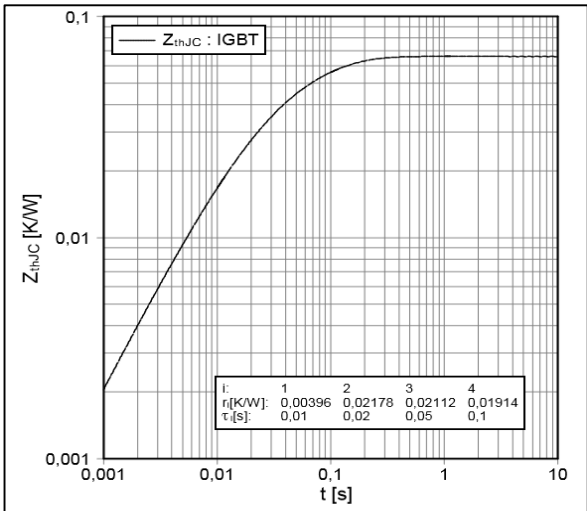
Forward Characteristics



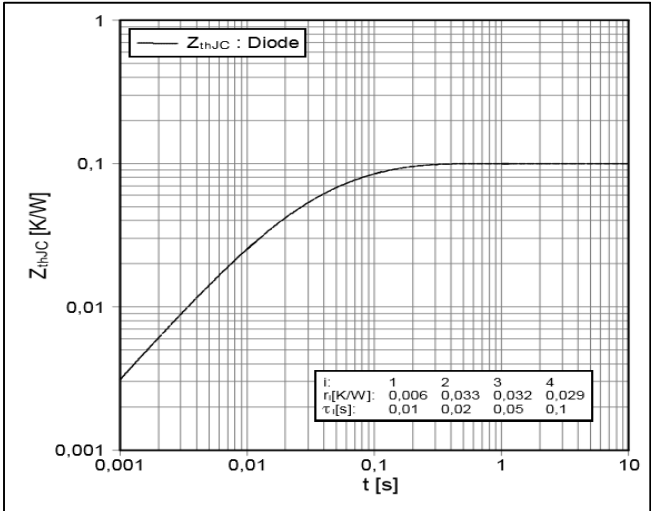
Switching Loss Diode (R_{Gon}=1.5 Ω, V_{ce}=600V)



Transient Thermal Impedance (IGBT)

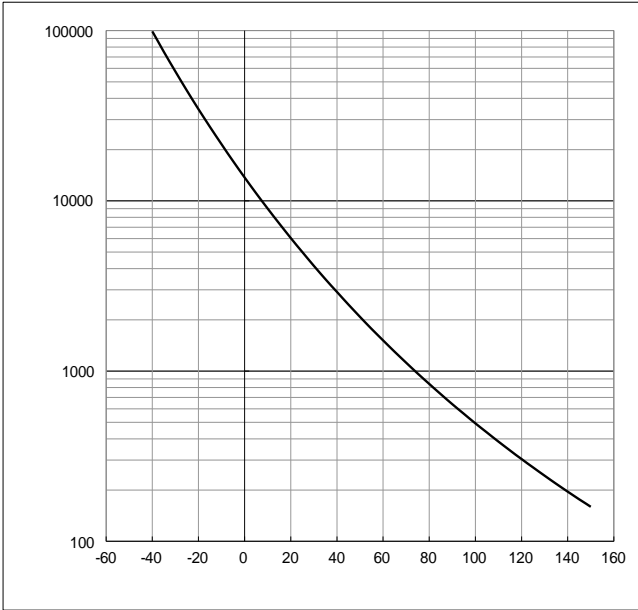


Transient Thermal Impedance (FRED)





Typ.NTC Temperature Characteristics



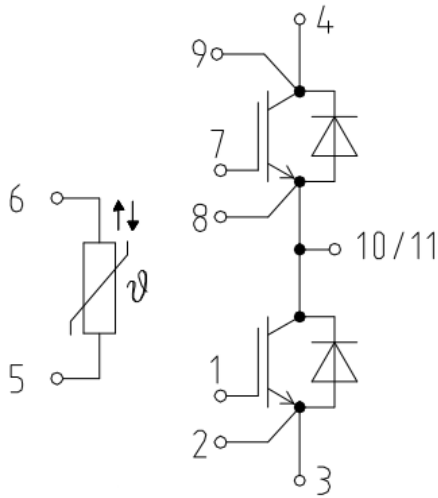


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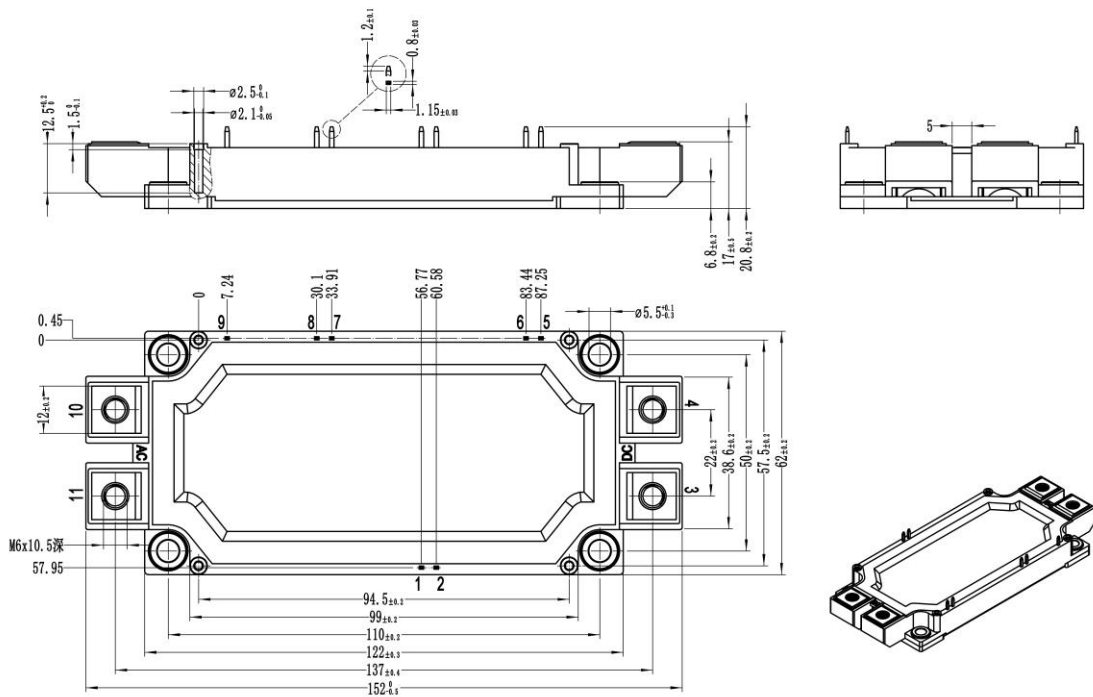
外形尺寸 PACKAGE MECHANICAL DATA

Circuit diagram

单位 Unit: mm



Package outlines





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。
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- 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

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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.
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