

大亞秋田電子科技（深圳）有限公司


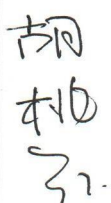
負溫度系數熱敏電阻器
 規格：WMF21-5D11XMPUP8BF16
 產品規格書

製造廠商：

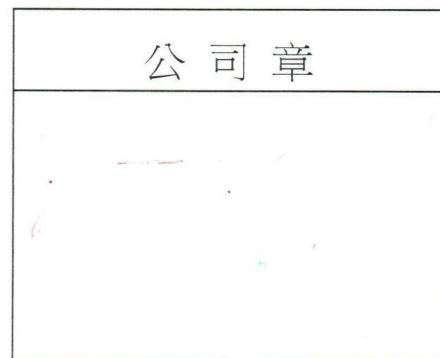
使用廠商：

大亞秋田電子科技（深圳）
 有限公司

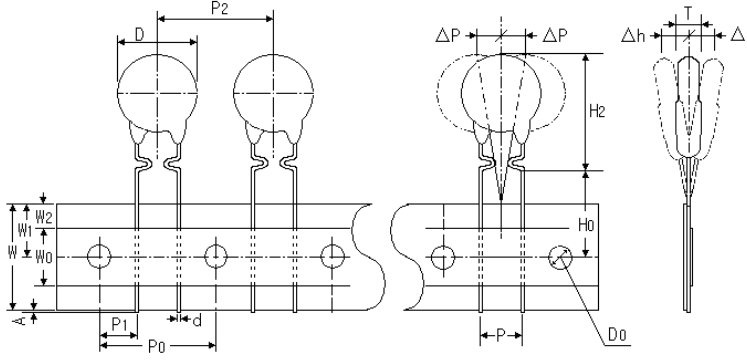
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認可	審核	製作
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認可	審核	製作



PART NO. 料号	WMF21-5D11XMPUP8BF16	NTC THERMISTOR 4.0A/5.0 Ω	REV NO. 版本	0/A (Sep. 13th,2022)
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1. APPEARANCE 外观			
<p>1-1. Dimensions (mm)尺寸</p>  <p>※ 1. 尺寸要求见“7. 编带尺寸要求”。</p>	<p>1-2. Marking 标志 <input checked="" type="checkbox"/> NTC 5D-11</p> <p>1-3. Coating 包封 <input type="checkbox"/> No coating 无包封 <input checked="" type="checkbox"/> Coating 包封</p> <table border="0"> <tr> <td data-bbox="890 649 1228 884"> <p>Material 包封材料</p> <input checked="" type="checkbox"/> PF resin 酚醛树脂 <input type="checkbox"/> Silicon 硅树脂 <input type="checkbox"/> Epoxy 环氧树脂 <input type="checkbox"/> Others 其他 </td> <td data-bbox="1228 649 1527 884"> <p>Color 颜色</p> <input type="checkbox"/> Green 绿色 <input type="checkbox"/> Red 红色 <input type="checkbox"/> Tan 黄色 <input checked="" type="checkbox"/> Black 黑色 <input type="checkbox"/> Blue 兰色 </td> </tr> </table> <p>1-4. Leads 引线 <input type="checkbox"/> Tin-plated copper wire 镀锡铜线 <input checked="" type="checkbox"/> Tin-plated steel wire 镀锡钢线 <input type="checkbox"/> Straight 直形 <input type="checkbox"/> Axis-formed 轴弯 <input checked="" type="checkbox"/> In-Forming 内弯 <input type="checkbox"/> No Lead 无引线 </p>	<p>Material 包封材料</p> <input checked="" type="checkbox"/> PF resin 酚醛树脂 <input type="checkbox"/> Silicon 硅树脂 <input type="checkbox"/> Epoxy 环氧树脂 <input type="checkbox"/> Others 其他	<p>Color 颜色</p> <input type="checkbox"/> Green 绿色 <input type="checkbox"/> Red 红色 <input type="checkbox"/> Tan 黄色 <input checked="" type="checkbox"/> Black 黑色 <input type="checkbox"/> Blue 兰色
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2. MECHANICAL CHARACTERISTICS 机械性能		
Item 指标项目	Specification 技术要求	Test Conditions & Methods 测试条件/方法
2-1. Solder-ability 可焊性	<p>The terminals shall be uniformly tinned, and its area $\geq 95\%$ 浸润部分上锡均匀, 上锡面积 $\geq 95\%$</p>	<p>Dipping the NTC terminals to a depth of 15mm in a soldering bath of $245 \pm 5^\circ\text{C}$ and to the place of 6mm far from NTC body for 2-3s (See IEC68-2-20 /GB2423.28 Ta) 将引出端沾助焊剂后, 浸入到温度为 $245 \pm 5^\circ\text{C}$、深度为 15mm 的锡槽中锡面距 NTC 本体下端 6mm 处, 持续 2-3 秒。(参见 IEC68-2-20 /GB2423.28 试验 Ta)</p>
2-2. Resistance To Soldering Heat 耐焊接热	<p>No visible mechanical damage. 无可见损伤 $\Delta R/R_N \leq 20\%$ ($\Delta R = R_N - R_N'$)</p>	<p>Dipping the NTC terminals to a depth of 15mm in a soldering bath of $260 \pm 5^\circ\text{C}$ and to the place for 6mm below from NTC body for $10 \pm 1\text{s}$. After recovering 4-5h under $25 \pm 1^\circ\text{C}$. The rated zero power resistance value R_N' shall be measured. (See IEC68-2-20 /GB2423.28 Tb) 根据 IEC68-2-20 (GB2423.28) 试验 Tb 进行试验。采用焊槽法, 将引出端沾助焊剂后, 浸入到温度为 $260 \pm 5^\circ\text{C}$、深度为 15mm 的锡槽中, 锡面距 NTC 本体下端 6mm 处, 维持 10 ± 1 秒. 在 $25 \pm 1^\circ\text{C}$ 条件下恢复 4-5h 后, 复测额定零功率电阻 R_N'.</p>

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2-3. Strength of lead terminal 引出端强度	No break out 无损坏 $\Delta R/R_N \leq 20\%$ ($\Delta R = R_N - R_N' $)	Fasten the body and apply a force gradually to each lead until 30N and then keep for 10sec, Hold body and apply a force to each lead until 90° slowly at 20N in the direction of lead axis and then keep for 10sec, and do this in the opposite direction repeat for other terminal. After recovering 4~5h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. (See IEC68-2-21/GB2423.29 U _a / U _b) 根据 IEC68-2-21 (GB2423.29) 试验 U 进行试验。 试验 U _a : 拉力 10N, 持续 10S; 试验 U _b : 弯曲 90°, 拉力 5N, 持续 10S; 扭转 180°, 拉力 5N, 持续 10S。 在 25±1℃ 条件下恢复 4~5 h 后, 复测额定零功率电阻 R _N '		
3.ELECTRICAL CHARACTERISTICS 电气性能				
3-1.Test Conditions & Method 测试条件/方法				
Items 指标项目	Spec. 技术要求	Test Conditions & Methods 测试条件/方法		
3-1-1.Rated Zero-Power Resistance 额定零功率电阻 R _N (Ω)	5.0±20%	Ambient temp. Range:25℃±1℃(T _A). Testing voltage: 1.5Vdc After placing for 1~2 hours under T _A , the resistance value shall be measured. 环境温度 T _A : 25℃±1℃ 测试电压: 1.5Vdc 在常温 T _A 条件下, 放置 1~2 小时后测得阻值 R _N .		
3-1-2.Thermal Dissipation Constant 热耗散系数 (mW/°C)	≥13	The thermal dissipation constant(δ) could be calculated by the ratio of a change in power dissipation(ΔP) of the thermistor to a change in temperature(ΔT) of the thermistor at a specified ambient temperature 在特定的环境温度下, 热耗散系数(δ)为热敏电阻电功率消耗(ΔP)与本体温度变化量 (ΔT)的比值.		
3-1-3.Thermal TimeConstant 热时间常数 τ (s)	≤45	The time(τ) shall be measured within which the temperature change of NTC thermistor is reached at 63.2% of the ambient temperature change under zero power condition 热时间常数(τ)为在零功率条件下, 热敏电阻的温度下降到其最初温度与最终温度之差为 63.2% 时所需要的时间		
3-1-4.Material Constant 材料常数 B (°K)	2800±20% B=T ₁ T ₂ /(T ₂ -T ₁) ×L _n (R ₁ /R ₂)	R ₁ , R ₂ is zero-power resistance at T ₁ , T ₂ R ₁ , R ₂ 分别为 T ₁ , T ₂ 温度下的零功率电阻 T ₁ = 298.15°K(25°C) T ₂ = 323.15°K(50°C)		

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3-1-5. Maximum permissible capacity. 最大允许电容量 (uF)	300	Ambient temp. Range 环境温度:25℃±2℃. Testing voltage 测试电压:240V		
3-1-6.Max.Steady State Current 最大稳态电流(A)	4.0A No visible mechanical damage. 无可见损伤 $\Delta R_N/R_N \leq 20\%$ ($\Delta R = R_N - R_N' $)	Ambient temp. Range 环境温度:25℃±1℃. Testing Current 测试电流: 4.0A		
4. Reliability Test 可靠性试验				
Items 指标项目	Spec. 技术要求	Test Conditions & Methods 测试条件/方法		
*4-1. Temp. Cycling Testing 温度循环测试	No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N' $)	Ta:-40±2℃/ 30min→25±1℃/ 5min→ Tb:170±2℃/ 30min→25±1℃/ 5min After recovering 4~5 h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. 在 Ta=-40±2℃和 Tb=170±2℃的环境温度中各存放 30 分钟, 循环 5 次.每次高低温循环都有在 25±1℃的环境中过渡 5 分钟。 样品进行温度循环测试后, 取出放置室温 (25±1℃) 4~5 小时后测量零功率电阻 R _N '.		
*4-2. Electrical Cycling Testing 电循环测试		Ambient temp. Range:25℃±1℃. Cycles: 1,000times On / Off: 1min/5min Test Current 4.0A After recovering 4~5h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. 环境温度:25℃±1℃. 循环次数: 1,000 次 通/断: 1min/5min 测试电流 4.0A 样品置于室温 (25±1℃) 4~4 小时后,测量其零功率电阻 R _N '.		
*4-3.LoadLife (Endurance) Testing 持久性测试		Ambient temp. Range:25℃±1℃; 4.0A / 1,000±24h After recovering 4~5 h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. 环境温度:25℃±1℃. 样品通过最大工作电流 4.0A , 1,000±24 小时后, 取出置于室温 (25±1℃) 4~5 小时后,测量其零功率电阻 R _N '.		
*4-4. Humidity Testing 耐湿性测试	No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N' $)	Ambient temp. range : 40℃±2℃ R.H.:93±3% , Energized time:1000±24 h After recovering 4~5 h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. 在温度 40±2℃,相对湿度 93±3%的环境中放置 1000±24 小时后, 取出置于室温 (25±1℃) 4~5 小时后, 测量其零功率电阻 R _N '.		
*4-5. High Temperature storage 高温存储测试	No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N' $)	Ambient temp. range : 170℃±2℃ Energized time:1000±24h After recovering 4~5 h under 25±1℃, the rated zero power resistance value R _N ' shall be measured. 在温度 170±2℃,环境中放置 1000±24 小时后, 取出置于室温 (25±1℃) 4~5 小时后, 测量其零功率电阻 R _N '.		

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5. INSPECTION 检验方法

5-1. Lot Inspection 批量检验

Sampling with IEC410 / DIN ISO 2859-1 (GB/T2828.1-2003) ;Testing with SPEC.NO.: WL21-20200106-1.
 抽样方法按 IEC410/ DIN ISO 2859-1 (GB/T2828.1-2003) ; 试验方法按 SPEC.NO. : WL21-20200106-1.

Item 指标项目	IL	AQL	Item 指标项目	IL	AQL
Appearance 外观	II	0.65	Rated Zero-Power Resistance 额定零功率电阻 R _N	II	0.65
Soldering-ability 可焊性	S-2	2.5	Max.Steady State Current 最大稳态电流(A)	S-2	2.5

5-2. Periodic Inspection 周期性试验

See the items with *参见*条目

6. NUMBERING SYSTEM AND PACKING 产品标号及包装

6-1. PART NUMBERING 产品编号

WMF21	-	5	-	D11X	M	P	U	P	8	B	F	16
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- ① Series WMF21: NTC thermistors for limiting of inrush current
WMF21 系列: 用于抑制浪涌电流系列 NTC 热敏电阻器
- ② Rated zero power resistance 额定零功率电阻 5:5.0Ω 4.7:4.7Ω 10:10Ω
- ③ Disk diameter 芯片尺寸 D11X: Φ10; D15: Φ15mm D13: Φ13mm
- ④ Tolerance of Resistance 阻值允差: M - ±20% N- ±30% ; K - ±10%
- ⑤ Coating Material 封装材料: G - Green Silicone 绿色硅树脂 S - Black Silicone 硅树脂 N - No Coating 无封装
P - PF Resin 酚醛树脂 E - Epoxy 环氧树脂
- ⑥ Shape of Leads 引线形状: A - Axis Formed 轴弯 U - In-formed 内弯 S - Straight 直形 N - No Leads 无引线
- ⑦ Coating material 引线材质: U-Cu 铜线 P-Cp 钢线
- ⑧ Leads Diameter 引线直径: 6 - Φ0.6mm 5 - Φ0.5mm 1 - Φ1.0mm 8 - Φ0.8mm
- ⑨ Leads Distance 引线间距: B 5.0mm A - 2.5mm C - 7.5mm D - 10.0mm
- ⑩ Packing Type 包装类型: F - Foldable Tape 折叠编带 A - Ammo 条带 R - Reel 盘带 B - Bulk 散装
- ⑪ Leads length 引线长度: 16.0 - 16.0 ± 1.0mm 3.5 - 3.5 ± 0.5mm 10 - 10.0 ± 1.0mm

6-2. Lot Numbering 批号编号方法

TL1	130135	1/3
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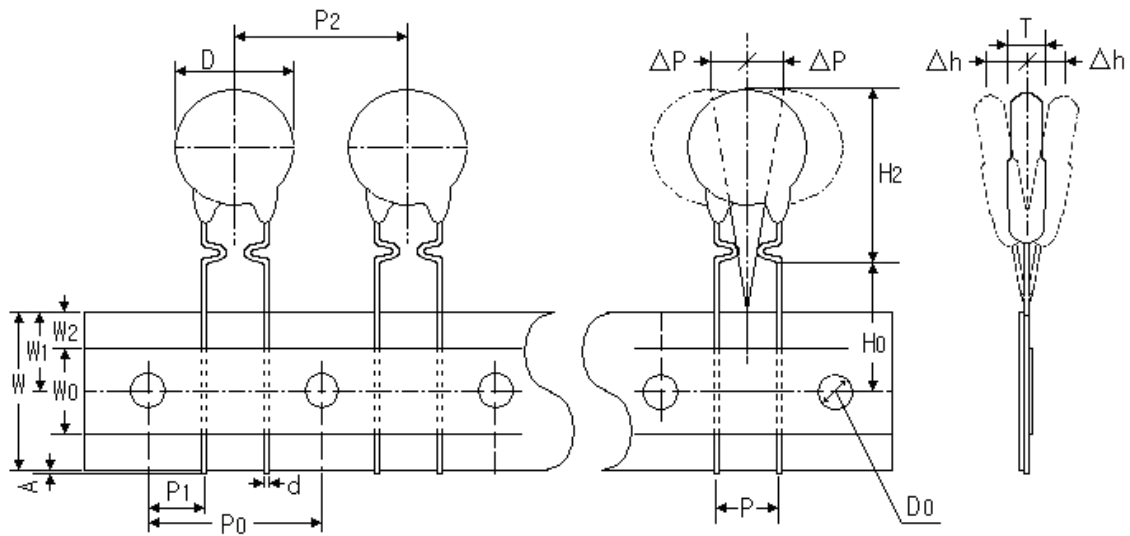
- ① Material code 材料代号 TL1: TL 材料第 1 批;
- ② Pipelined batch number 流水批号: 130135;
- ③ Shipment branch card batch number 出货分卡号;

6-3. Packing Type 包装方式


- Bulk 散装 500 只/包
- Ammo 条带
- Foldable Tape 折叠编带

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7. 编带尺寸要求:



Dmax	12.0mm
Tmax	5.5mm
$d \pm 0.05$	0.8mm
$P \pm 0.5$	5.0mm
$P_0 \pm 0.3$	15.0mm
$P_1 \pm 0.7$	3.75mm
$P_2 \pm 1.0$	15.0mm
$H_0 \pm 1.0$	16.0mm
H2max	18.0mm
$W \pm 1.0$	18.0mm
$W_0 \pm 1.0$	10.0mm
$W_1 \pm 1.0$	9.0mm
$W_2 \pm 1.0$	1.5mm
ΔP_{max}	1.0mm
Δh_{max}	2.0mm
Amax	0.5
$D_0 \pm 0.2$	4.0

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<p>9. Operating Temperature Range 工作温度范围: -40 ~ +170°C</p>				
<p>10. STORAGE CONDITIONS 存贮环境条件: 10-1. Temperature 温度: -10°C ~ +40°C 10-2. Humidity 湿度: ≤70%RH 10-3. Term 期限: ≤6 months (First-in/ First-out 先进先出) 10-4. Place 地点: Do not exposing the components to the following conditions, otherwise, it may result in deterioration of characteristics. 不要暴露在下列环境条件下, 否则将导致性能衰退或参数飘移: 1) Corrosive gas or deoxidizing gas. 腐蚀性或易氧化气体 2) Flammable and explosive gases. 易燃易爆气体 3) Oil, water and chemical liquid. 油、水和化学溶液 4) Under the sunlight. 太阳光下 10-5. Handling after seal open: After unpacking of the minimum package, reseal it promptly or store it inside a sealed container with a drying agent. 尽量保证开口最小化, 立即重新封好, 并贮存在密封、带有干燥剂的容器中。</p>				
<p>11. WARNING 注意、警告! </p> <p>Do not apply the components under the following conditions, otherwise, it may result in deterioration of characteristics, destruction of components or in the worst case, to catching fire. 请不要在下列条件下使用本元件, 否则将可能导致产品性能衰退或产品损毁, 甚至引发火灾: 1) Exceeding I_{max}. 超过最大工作电流 2) Exceeding rated temperature range. 超过许可工作温度范围 3) Inferior thermal dissipation (Due to badly inferior thermal dissipation, some part of the components body will become overheated and then be damaged.) 散热不良 (由于散热不, 本元件可能因部分过热而导致破坏)</p>				