FLYiNG 汎翊國際有限公司
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APPROVAL SHEET

CUSTOMER: _____

抑制浪涌型負溫度系數熱敏電阻器

PART NAME: NTC Thermistor for Limiting Inrush Current

PART NUMBER: NTC 4D-15

DATE: July 9, 2021

CUSTOMER	MANUFACTURER
QA Dept:: _____	Manufacture Dept: Jian-Wei, Wu
Manufacture Dept: _____	QA Dept:: Yen
Engineering Dept: _____	Manager.: Nana, Lee
SEAL:	SEAL:

PART NO. CONFIGURATION:

NTC	4	D	—	15
NTC Thermistor	Rated Zero-power Resistance: 4Ω	Disc Type		Max. Chip Dia.: ϕ 15mm

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SPECIFICATION FOR APPROVAL

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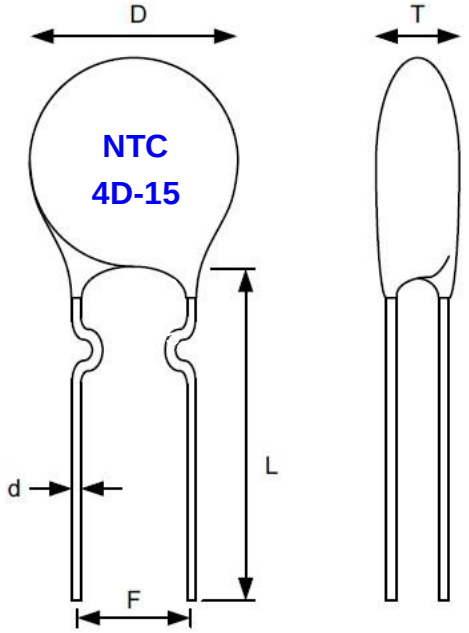
1	OUTLINE	
1.1	APPEARANCE 外觀	Without Any Crack, Marking Should be Clear 無可見損傷. 標示清晰
1.2	Common Parameters 一般參數	1.2.1 Size (mm) 尺吋



D (Max.)	17.5
L (Min.)	25
F (± 1.0)	7.5
T (Max.)	7.0
d (±0.06)	0.78
1.2.2 Materials 材料	
Wrapper 包封	PF resin 酚醛樹脂
Down-lead 引線	Tin-plated steel wire 鍍錫鋼線
Lead style 腳型	Inward Crimped 內彎腳
Coating color 顏色	Black 黑色

2.	Parameters of Technology 主要技術參數	
2.1	Rated Zero Power Resistance at 25℃ (Ω) 額定零功率電阻值	4
2.2	Material Constant 材料常數 $B_{25/85}$: B(°K)	2800
2.3	Max Steady State Current (A) 最大穩态電流	7
2.4	Thermal Dissipation Constant (mW/℃) 耗散系數	≧ 16
2.5	Thermal Time Constant τ(s) 熱時間常數	≦ 90
2.6	Operating Temperature Range (℃) 工作溫度範圍	-40 ~ +200

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3	INSPECTION 檢驗方法
3.1	Lot Inspection 批量檢驗 Sampling with IEC410/ DIN ISO2859-1 (GB/T2828.1-2003) 抽樣方法按 IEC410/DIN ISO2859-1 (GB/T 2828.1-2003)

Item 指標項目	IL	AQL	Item 指標項目	IL	AQL
Appearance 外觀	II	0.65	Rated Zero-Power Resistance 額定零功率電阻 R_N	II	0.65
Soldering-ability 可焊性	S-2	2.5	Max. Steady State Current 最大稳態電流 (A)	S-2	2.5

4	Storage Conditions 儲存環境條件
4.1	Temperature 溫度: -10℃ ~ +40℃
4.2	Humidity 濕度: ≦ 70 %RH
4.3	Term 期限: ≦ 6 months (First-in/ First- out 先進先出)
4.4	Place 地點: Do not exposing the components to the following conditions, otherwise, it may result in deterioration of characteristics. 不要暴露在下列環境中，否則將導致性能衰退或參數飄移 1). Corrosive gas or deoxidizing gas. 腐蝕性或易氧化氣體 2). Flammable and explosive gases. 易燃易爆氣體 3). Oil, water and chemical liquid. 油. 水和化學溶液 4). Under the sunlight. 太陽光下
4.5	Handling after seal open: After unpacking of the minimum package, reseal it promptly or store it inside a sealed container with a drying agent. 儘量保證開口最小化，立即重新封好，並儲存在密封，帶有乾燥劑的容器中
5	Warning 注意. 警告 ⚠ 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. 請不要在下列條件下使用本元件，否則將可能導致產品性能衰退或產品損毀，甚致引發火災. 1). Exceeding I_{max}: 超過最大工作電流 2). Exceeding rated temperature range. 超過許可工作溫度範圍 3). Inferior thermal dissipation (Due to badly inferior thermal dissipation, some part of the components body will become overheated and then be damaged.) 散熱不良(由於散熱不良，本元件可能因部分過熱而導致破壞

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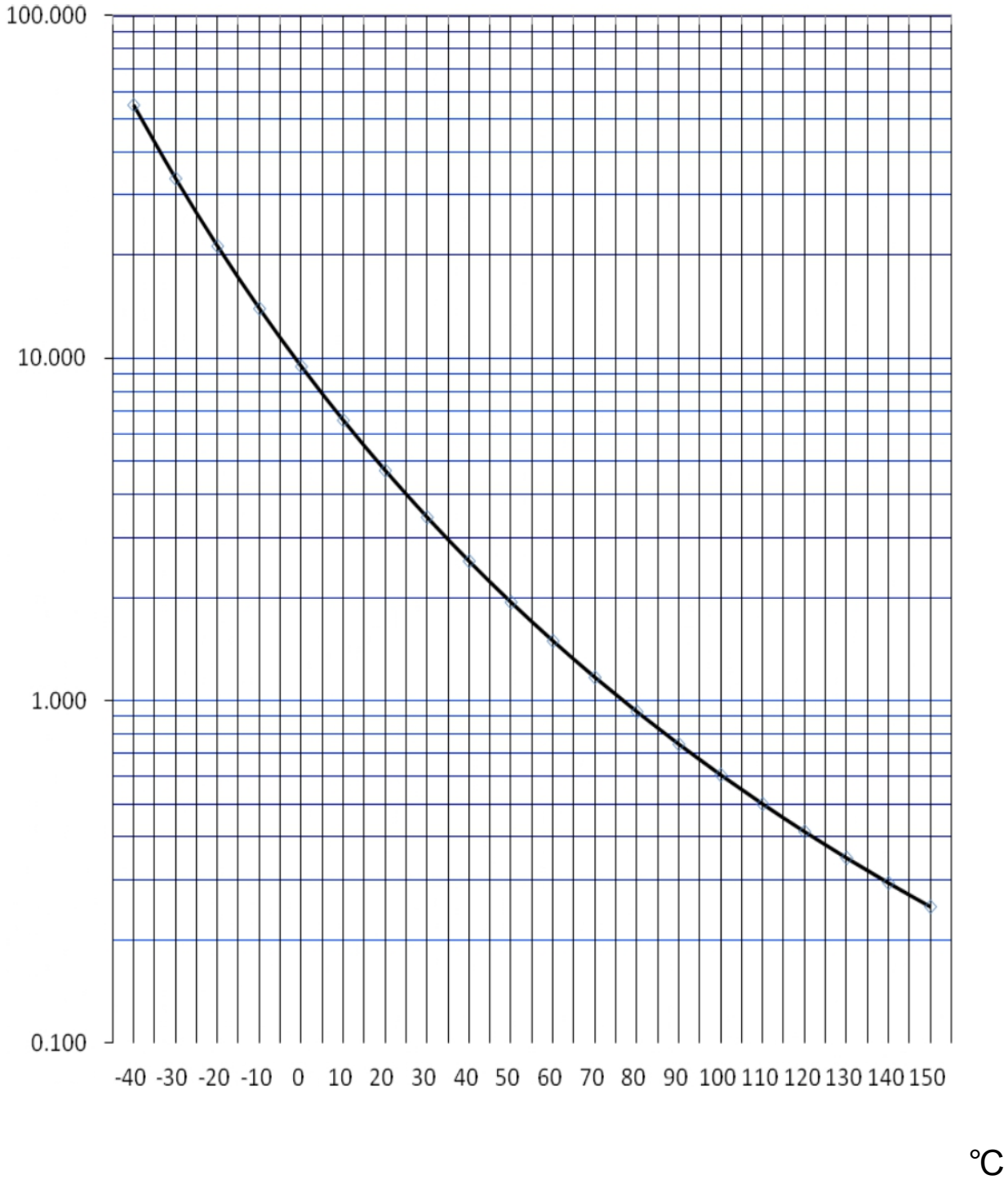
6	R/T Curve 阻溫曲線		



APPENDIX 附錄

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1	Mechanical Characteristics 機械性能		
ITEM 指標項目	Specification 技術要求	Test Conditions & Methods 測試條件和方法	
1.1 Soldering -ability 可焊性	The terminals shall be uniformly tinned, and its area ≧ 95% 浸潤部分上錫均勻，上錫面積 ≧ 95%	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 235±5℃ and to the place of 6mm far from NTC body for 2-3s (see IEC68-2-20/ GB2423.28Ta) 將引出端沾助焊劑後，浸入到溫度為 235±5℃，深度為 15mm 的錫槽中錫面距 NTC 本體下端 6mm 處，持續 2-3 秒. (參見 IEC68-2-20/ GB2423.28 試驗 Ta)	
1.2 Resistance to Soldering Heat 耐焊接熱	No visible mechanical damage. 無可見損傷 Δ R/R_N ≤ 20% (Δ R=| R_N-R_N' |)	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 260±5℃ and to the place for 6mm below from NTC body for 10±1s. After recovering 4-5h under 25±2℃, the rated zero power resistance value R_N' shall be measured. (See IEC68-2-20/GB2423.28Tb) 採用焊槽法，將引出端沾助焊劑後，浸入到溫度為 260±5℃，深度為 15mm 的錫槽中，錫面距 NTC 本體下端 6mm 處，維持 10±1 秒，在 25±2℃ 條件下恢復 4-5h 後，復測額定零功率電阻 R_N' 根據 IEC68-2-20(GB2423.28Tb) 進行試驗	
1.3 Strength of lead terminal 引出端強度	No break out 無損壞 Δ R/R_N ≤ 20% (Δ R=| R_N-R_N' |)	Fasten the body and apply a force gradually to each lead until 10N and then keep for 10sec, hold body and apply a force to each lead until 90° slowly at 5N 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±2℃, the rated zero power resistance value R_N' shall be measured. (See IEC68-2-21/GB2423.29Ua/Ub) 根據 IEC68-2-21/GB2423.29 試驗 U 進行試驗 試驗 Ua: 拉力 10N，持續 10S 試驗 Ub: 彎曲 90° ，拉力 5n，持據 10S 扭轉 180° ，拉力 5N，持續 10S 在 25±2℃條件下恢復 4-5h 後，復測額定零功率電阻 R_N'	

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2	Electrical Characteristics 電氣性能		

ITEM 指標項目	Specification 技術要求	Test Conditions & Methods 測試條件和方法
2.1 Rated Zero-Power Resistance 額定零功率電阻 R_N(Ω)	4 ±20%	Ambient temp. Range: 25±2℃ (T_A) Testing Voltage : 1.5V_{DC} After placing for 1-2 hours under T_A, the resistance value shall be measured. 環境溫度 T_A: 25±2℃ 測試電壓: 1.5V_{DC} 在常溫 T_A 條件下，放置 1-2 小時後測得阻值 R_N.
2.2 Thermal Dissipation Constant 熱耗散系數 δ (mW/℃)	≧ 16	The thermal dissipation constant (δ)could be calculated by the ratio of a change in power dissipation (Δ P) of the thermistor to a change in temperature (Δ T) of the thermistor at a specified ambient temperature. 在特定的環境下，熱耗散系數(δ) 為熱敏電阻電功率消耗(Δ P)與本體溫度變化量(Δ T)的比值
2.3 Thermal Time Constant 熱時間常數 τ(s)	≤ 90	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. 熱時間常數 (τ) 為在零功率條件下，熱敏電阻的溫度下降到其最初溫度與最終溫度之差為 63.2%時所需要的時間
2.4 Material Constant B(K)	2800 ±5% $B=T_1T_2/(T_2-T_1)xL_n(R_1/R_2)$	R_1, R_2 is zero-power resistance at T_1,T_2 R_1, R_2 分別為 T_1, T_2 溫度下的零功率電阻 T_1=298.15 °K(25℃) T_2=358.15 °K(85℃)
2.5 Max Steady State Current (A) 最大穩態電流	6.0 A No visible mechanical damage. 無可見損傷 Δ R_N/R_N≤ 20% (Δ R=| R_N-R_N' |)	Ambient temp. Range 環境溫度: 25±2℃ Testing Current 測試電流: 6.0 A

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3	Reliability Test 可靠性試驗 (周期性檢測項目)		

ITEM 指標項目	Specification 技術要求	Test Conditions & Methods 測試條件和方法
3.1 Temp/ Cycling Testing 溫度循環測試	No visible mechanical damage 無可見損傷 Δ R_N/R_N≤ 20% (Δ R=| R_N-R_N' |)	Ta: -40±5℃/30 min. → 25±2℃/ 5 min. → Tb: 200±5℃/ 30 min. → 25±2℃/ 5 min. Cycles: 5 times After recovering 4-5h under 25±2℃, the rated zero power resistance value R_N' shall be measured. 在 Ta: -40±5℃ 和 T_b: 200±5℃ 的環境溫度中各存放 30 分鐘，循環 5 次，每次高低溫循環都有在 25±2℃ 的環境中過渡 5 分鐘. 樣品進行溫度循環測試後，取出放置室溫(25±2℃) 4-5 小時後測量零功率電阻 R_N'
3.2 Electrical Cycling Testing 電循環測試	No visible mechanical damage 無可見損傷 Δ R_N/R_N≤ 20% (Δ R=| R_N-R_N' |)	Ambient temp. Range: 25±2℃. Cycles: 1000 times On/Off: 1m/ 5m Test Current: 6.0A After recovering 4-5h under 25±2℃, the rated zero power resistance value R_N' shall be measured. 環境溫度: 25±2℃. 循環次數: 1000 次 通/斷: 1m/5m 測試電流: 6.0A 樣品置於室溫(25±2℃) 4-5 小時後，測量其零功率電阻 R_N'
3.3 Load Life (Endurance) Testing 持久性測試	No visible mechanical damage 無可見損傷 Δ R_N/R_N≤ 20% (Δ R=| R_N-R_N' |)	Ambient temp. Range: 25±2℃.; 6.0A / 1000±24h After recovering 4-5h under 25±2℃, the rated zero power resistance value R_N' shall be measured. 環境溫度: 25±2℃. 樣品通過最大電流: 6.0A, 1000±24h 後，取出置於室溫(25±2℃) 4-5 小時後，測量其零功率電阻 R_N'
3.4 Humidity Testing 耐濕性測試	No visible mechanical damage 無可見損傷 Δ R_N/R_N≤ 20% (Δ R=| R_N-R_N' |)	Ambient temp. range: 40±2℃ R.H.: 93±3%, Energized time: 1000±24h After recovering 4-5h under 25±2℃, the rated zero power resistance value R_N' shall be measured. 在溫度 40±2℃，相對濕度 93±3%的環境中放置 1000±24h 後，取出置於室溫(25±2℃)4-5 小時後，測量其零功率電阻 R_N'