帝科微 DIKEWEI

深圳市帝科微电子有限公司

DIKEWEI ELECTRONICS TECHNOLOGY., TLD. SHENZHEN

NTC热敏电阻

NTC THERMISTOR

优良品质 · 诚信经营

一 起 携 手 · 共 创 辉 煌

www.dikewei.cn

MF72 功率型热敏电阻

MF72 POWER NTC THRMISTOR

产品简介 PRODUCTS BRIEF INTRODUCTION MF72

功率型热敏电阻器：为有效抑制电子电路在开机上电的瞬间产生的浪涌电流，在电源电路中串联一个功率型 NTC 热敏电阻器，能有效地抑制开机时的浪涌电流，并且在完成抑制浪涌电流作用后，由于通过其电流的持续作用，功率型 NTC 热敏电阻器的电阻值将下降到非常小的程度，它自身消耗的功率可以忽略不计，所以，在电源回路中串接功率型 NTC 热敏电阻器，是抑制开机浪涌电流保护电子设备免遭破坏的最为简便而有效的措施。MF72 为功率型热敏电阻的国标型号。

我司 MF72 功率型热敏电阻通过了 UL、CUL、CQC、TUV 认证。

The MF72 Power NTC Thermistor provide inrush current suppression for sensitive electronics. Connecting a NTC Thermistor in series with the power source will limit the current surges typically created at tum on. Once the circuit is energized the resistance of the NTC thermistor will decrease rapidly to a very low value， power consumption can be ignored and there will be no effect on normal operating current. Using the MF72 Power NTC Thermistor is a most cost-effective way to curb surge current and protect sensitive electronics from damage.MF72 for power type thermal resistance GB models.

MF72 Power NTC thermistor acquired the UL CUL CQC and TUV certification.

应用范围和特点 APPLICATION RANGE AND CHARACTERISTICS

应用范围 Appliaction

○转换电源，开关电源，UPS 电源	○ Switching power-supply，switch power，ups power
○镇流器及各类加热器	○ Electronic energy saving lamps，electronic ballast and all kinds of electric heater
○各类显像管，显示器	○ All kinds of RT，display
○电子节能灯，其它照明灯具	○ Bulb and other lighting lamps

特点 Characteristic

○体积小，功率大，抑制浪涌电流能力强	○ Small size，large power，strong capacity of suppression of inrush current
○反应速度快	○ Fast resporse

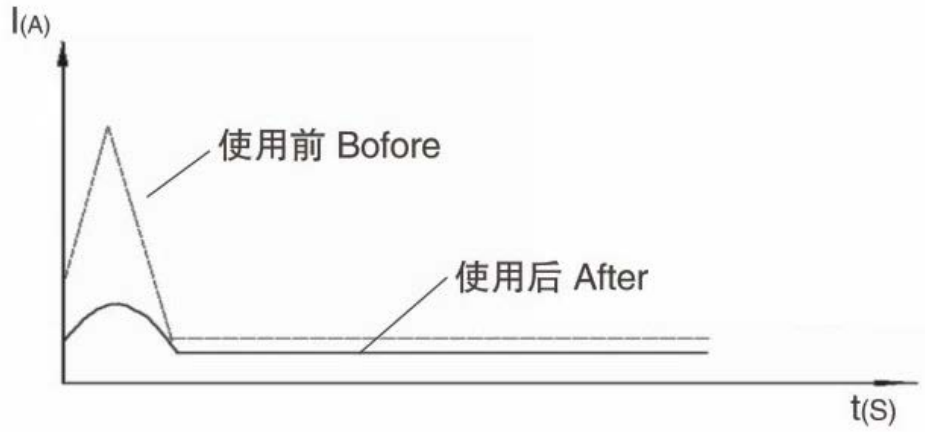
〇材料常数（B 值）大，残余电阻小　　〇 Big material constant（B value），small residual resistance

〇寿命长，可靠性高　　〇 Long life and high reliability

〇系列全，应用范围宽　　〇Complete series，wide applications

功率型 NTC 热敏电阻器在电路中抑制浪涌电流示意图

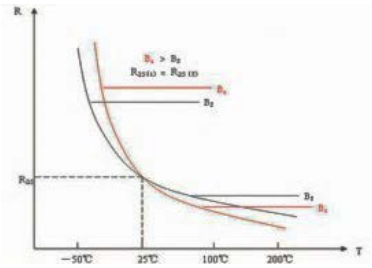
SKETCH MAP OF SURGE CURRENT PROTECTION IN CIRCUIT OF POWER NTC THERMISTOR

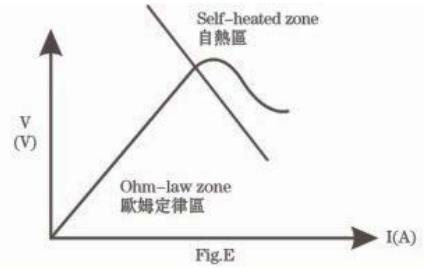


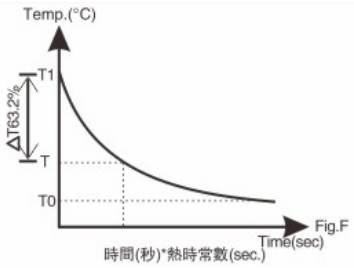
MF72 功率型热敏电阻之特性

MF72 功率型热敏电阻的参数，通常由下列三种基本特性决定：

电阻-温度特性	电压-电流特性	温度-时间特性
当 MF72 功率型热敏电阻之环境温度或它本身的温度上升时，电阻值随之减小。 When the ambient temperature of the MF72power type thermistor is applied，orAs its temperature rises，the resistance decreases.	当 MF72 功率热敏电阻在小电流下工作时，由于功率太低，其电阻值保持固定而表现线性（符合欧姆定律 V/R=l）。如果电流增加，MF72 功率型热敏电阻就会产生焦耳效应（P=V*1）而使自己发热，其电阻随即减小表现（电流增加，电压下降）的状态。 When the MF72 power thermistor works at small current When the power is too low，the resistance is kept constant. And behave linearly（in accordance with Ohm's law，V/R=l）. If As the current increases，the MF72 power type thermistor will Produces a Joule effect（P=V*I）and makes itself hot. The resistance then decreases （ current increases，voltage decreases）State.	MF72 功率型热敏电阻与环境达成热平衡所需的时间，主要决定于材料热容量（H）及散热系数（8）。 The MF72 power type thermistor achieves heat with the environment. The time required for the equilibrium is mainly determined by the heat of the materialCapacity（H）and heat transfer coefficient（delta）.







MF72 规格型号说明点 MF72 HOW TO ORDER

VDK □ D □□ M VDK □

VDK 是帝科微商标
VDK DIKEWEIL Logo
NTC 是中性标志
Nevtral Sign

额定功率阻值 Ω
Rated Power Resistance

产品形状 Shape
D 圆片形 Disk

产品直径 mm
Dimension

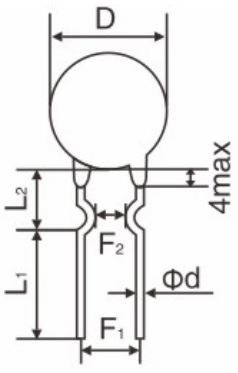
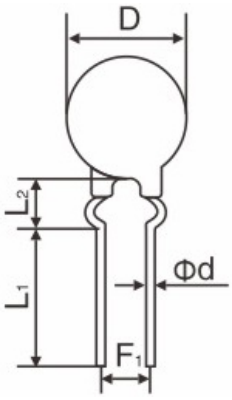
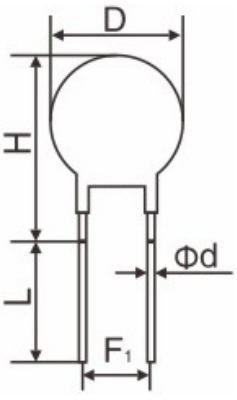
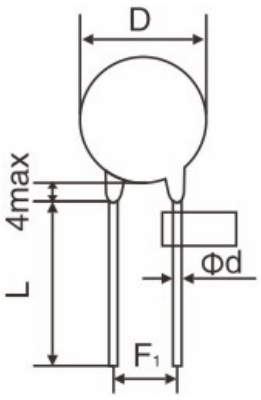
VDK 是帝科微商标
VDK DIKEWEIL Logo

阻值偏差 Tol.
M：±20%或空白为默认±20%
L：±15%定制

包装方式/导线长短
Packing Form/Lead length
B 或空白：散装 B or blank：Bulk
C：切短脚散装 Cutting Bulk
T：编带包装 Taping

产品外型/L_1/L_2
Produt Shape
S(空白=S)型:直脚
l 型：内弯脚 In type
O 型：外弯脚 out type
L_1/L_2：弯下长度/弯上长度

外形 APPEARANCE

内弯脚（L Type）	外弯脚（O Type）	侧弯脚（Y Type）	直线脚（S Type）	厚度（T）
				

说明：若非特别指出，常用外形为内弯型长引线。

Note：if the particular shape, commonly used for bending type, namely the inner-bended forming for long lead

尺寸 SIZE

单位 Unit：mm

尺寸 Dim 代号 Sym (mm) 型号 Part NO.	Dmax	Tmax	Φd ±0.05	F1 ±1	F2 ±1.5	直脚 Straight Lead wire	弯脚 Curved Lead wire	
						L	L1±1	L2±2
VDK□D-5	7	5	0.55	5	3	3.0-20	3.0-20	7 or 4
VDK□D-7	9	5	0.55	5	3	3.0-20	3.0-20	7 or 4
VDK□D-9	11	5.5	0.75/0.55	7.5/5	5/3	3.0-20	3.0-20	7 or 4
VDK□D-11	13	5.5	0.75	7.5/5	5/3	3.0-20	3.0-20	7 or 4
VDK□D-13	15.5	6	0.75	7.5	5	3.0-20	3.0-20	7 or 4
VDK□D-15	17.5	6	0.75	10/7.5	5	3.0-20	3.0-20	7 or 4
VDK□D-20	22.5	7	1	10/7.5	7	3.0-20	3.0-20	7 or 4

MF72 产品标志说明 MF72 PART NUMBER EXPLANATION

公司标志 THE COMPANY LOGO

VDK	公司商标 Company logo
MF72	功率型热敏电阻 Power Thermistor
X	额定零功率电阻值 Rated Zero Power Resistance
Y	最大芯片直径 Max diameter of disk（mm）
CQC	VDK 安规认证标志 VDK safety certification mark

通用标志 GENERAL MARK

VDK	公司商标 Company logo
□□	最大芯片直径 Afety Chip Diameter
□R□	额定零功率电阻值（R 代表小数点） Rated Zero Power Resistance（R Stands For Decimal Points）
○	最大稳态电流 Max. steady State Current
	VDK 安规认证标志 VDK safety certification mark

中性标志 THE NEUTRAL MARKS-

VDK	负温度系数热敏电阻器 NTC thermistor
X	额定零功率电阻值 Rated Zero Power Resistance
D	圆片型 Wafer type
Y	最大芯片直径 Max diameter of disk（mm）

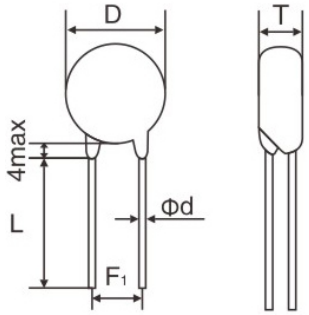
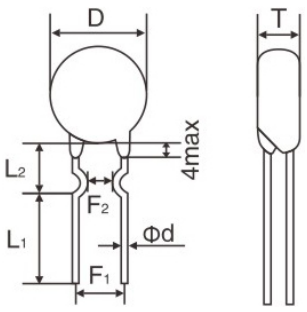
以上所有类型标志统称圆片型，如有特殊要求请与我们的销售人员联系，产品规格与数据若有变更，恕不另行通知。

All of the above types of marks round，if you have special request, please contact our sales staff, for product specification and data are subject to change without notice.

VDK□D-5

产品外形 PRODUCT APPEARANCE

单位 Unit：mm

直线脚	内弯脚
	

型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-5	7	5.0	0.55	5.0	3.0	3.0-20	3.0-20	7or4

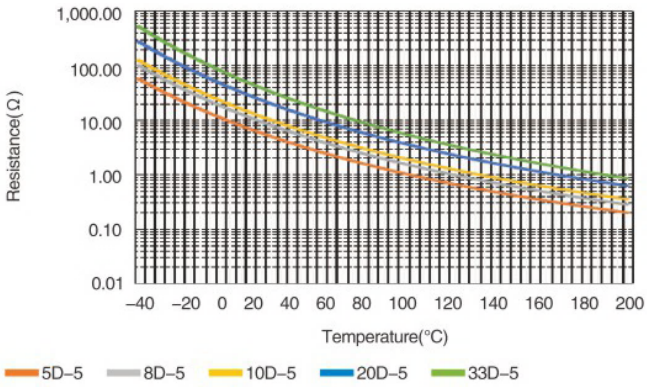
主要技术参数 MAIN TECHNICAL PARAMETERS

型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/°C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (°C)	认证		
									UL/CUL	CQC	TUV
5D-5	5	1	0.35	约 6	约 20	150/560	2700	-40~+150	√		√
8D-5	8	0.7	0.77			100/390	2700	-40~+150	√		√
10D-5	10	0.7	0.77			68/270	2700	-40~+150	√		√
20D-5	20	0.5	0.997			39/150	2800	-40~+150	√		√
33D-5	33	0.5	1.88			39/150	2950	-40~+150	√		√

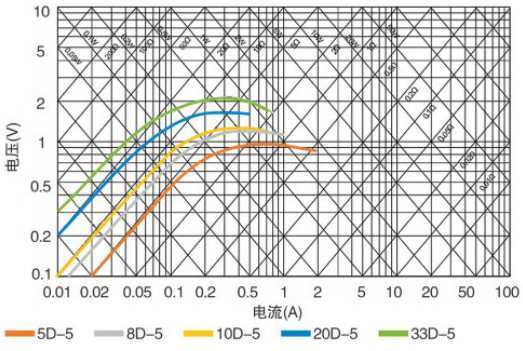
说明：*表示参考值

Note：*Represents a reference value

产品阻温特性
Resistance-Temperature Characteristic



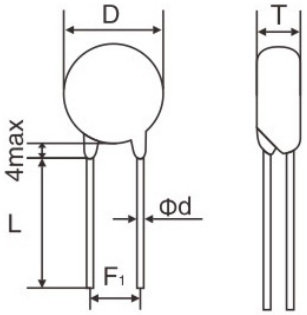
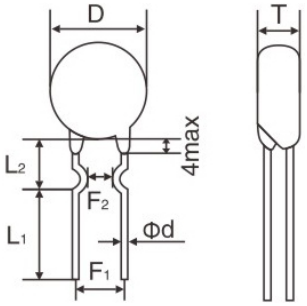
静态伏安特性
Static Characteristicse



VDK□D-7

产品外形 PRODUCT APPEARANCE

单位 Unit：mm

直线脚	内弯脚
	

型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-7	9	5.0	0.55	5.0	3.0	3.0-20	3.0-20	7or4

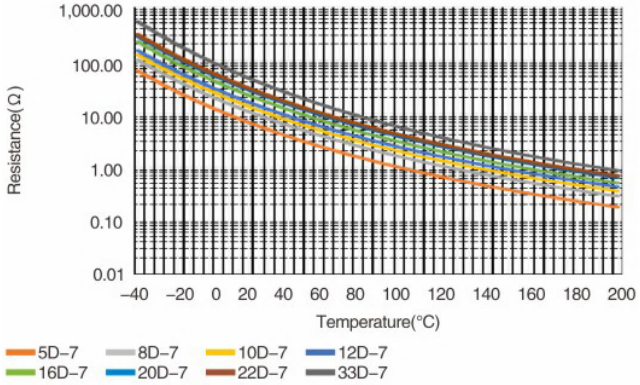
主要技术参数 MAIN TECHNICAL PARAMETERS

型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
5D-7	5	2	0.28	约 9	约 30	100/390	2700	-40~+150	√	√	√
8D-7	8	1	0.77			100/390	2700	-40~+150	√	√	√
10D-7	10	1	0.77			100/390	2700	-40~+150	√	√	√
12D-7	12	1	0.82			82/330	2700	-40~+150	√	√	√
16D-7	16	0.7	1.00			82/330	2800	-40~+150	√	√	√
20D-7	20	0.6	1.11			82/330	2800	-40~+150	√	√	√
22D-7	22	0.6	1.11			68/270	2800	-40~+150	√	√	√
33D-7	33	0.5	1.49			68/270	2950	-40~+150	√	√	√

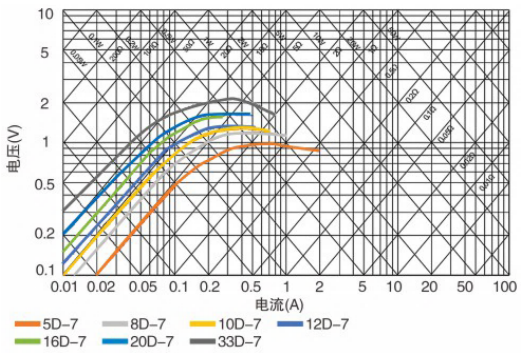
说明：*表示参考值

Note：*Represents a reference value

产品阻温特性
Resistance-Temperature Characteristic



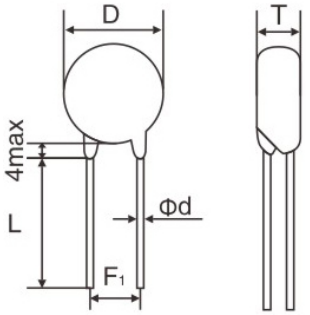
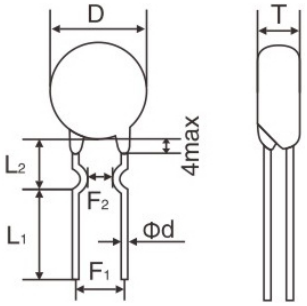
静态伏安特性
Static Characteristicse



VDK□D-9

产品外形 PRODUCT APPEARANCE

单位 Unit：mm

直线脚	内弯脚
	

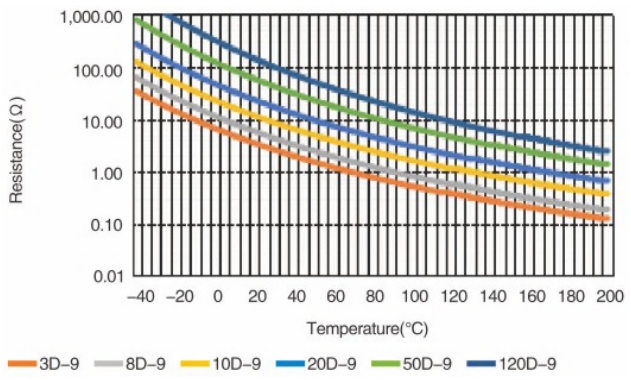
型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-9	11	5.5	0.75/0.55	7.5/5.0	5.0/3.0	3.0-20	3.0-20	7or4

主要技术参数 MAIN TECHNICAL PARAMETERS

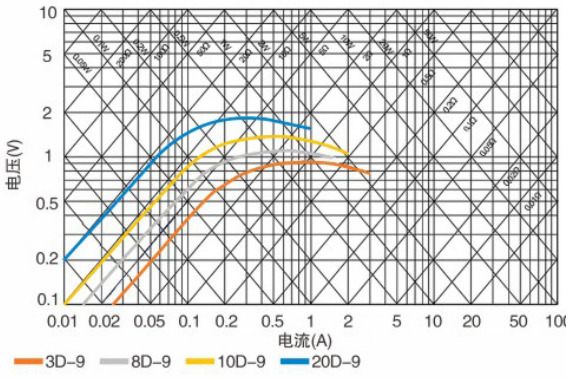
型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
3D-9	3	4	0.12	约 11	约 35	220/820	2600	-40~+175	√	√	√
5D-9	5	3	0.21			220/820	2700	-40~+175	√	√	√
6D-9	6	2	0.32			220/820	2700	-40~+175	√	√	√
8D-9	8	2	0.40			150/560	2700	-40~+175	√	√	√
10D-9	10	2	0.46			150/560	2700	-40~+175	√	√	√
12D-9	12	1	0.66			150/560	2700	-40~+175	√	√	√
15D-9	15	1	0.80			150/560	2800	-40~+175	√	√	√
16D-9	16	1	0.80			82/330	2800	-40~+175	√	√	√
20D-9	20	1	0.88			82/330	2800	-40~+175	√	√	√
22D-9	22	1	0.95			82/330	2800	-40~+175	√	√	√
33D-9	33	1	1.12			68/270	2950	-40~+175	√	√	√
50D-9	50	1	1.25			68/270	2950	-40~+175	√	√	√
100D-9	100	0.8	3.02			68/270	3200	-40~+175	√	√	√
120D-9	120	0.8	3.02			68/270	3200	-40~+175	√	√	√

说明：*表示参考值　　**Note：***Represents a reference value

产品阻温特性 Resistance-Temperature Characteristic



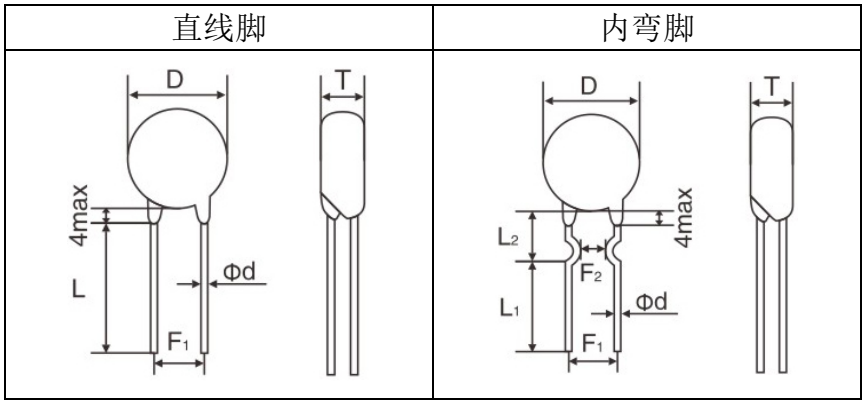
静态伏安特性 Static Characteristicse



VDK□D-11

产品外形 PRODUCT APPEARANCE

单位 Unit：mm



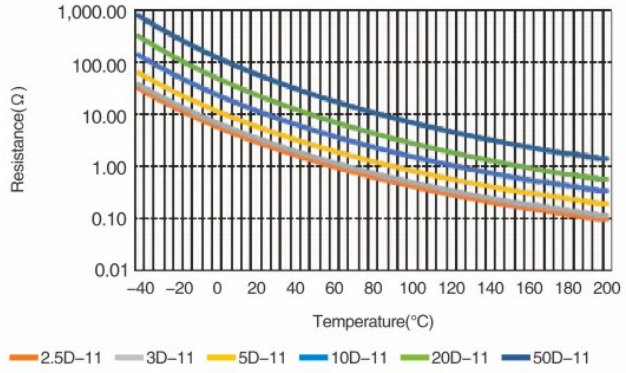
型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-11	13	6.0	0.75/0.55	7.5	5.0/3.0	3.0-20	3.0-20	7or4

主要技术参数 MAIN TECHNICAL PARAMETERS

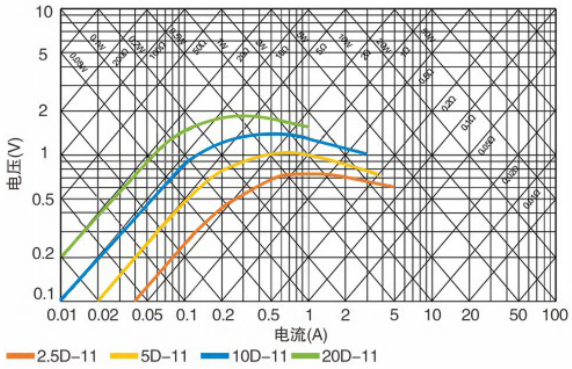
型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
2.5D-11	2.5	5	0.10	约 14	约 50	680/2700	2700	-40~+175	√	√	√
3D-11	3	5	0.10			680/2700	2700	-40~+175	√	√	√
5D-11	5	4	0.16			470/1800	2700	-40~+175	√	√	√
8D-11	8	3	0.25			470/1800	2800	-40~+175	√	√	√
10D-11	10	3	0.28			220/820	2800	-40~+175	√	√	√
12D-11	12	2	0.46			220/820	2800	-40~+175	√	√	√
15D-11	15	2	0.47			150/560	2800	-40~+175	√	√	√
16D-11	16	2	0.47			150/560	2800	-40~+175	√	√	√
20D-11	20	2	0.51			100/390	2950	-40~+175	√	√	√
22D-11	22	2	0.56			100/390	2950	-40~+175	√	√	√
33D-11	33	1.5	0.67			100/390	2950	-40~+175	√	√	√
47D-11	47	1.5	1.02			100/390	2950	-40~+175	√	√	√
50D-11	50	1.5	1.02			100/390	2950	-40~+175	√	√	√

说明：*表示参考值　　**Note：***Represents a reference value

产品阻温特性
Resistance-Temperature Characteristic



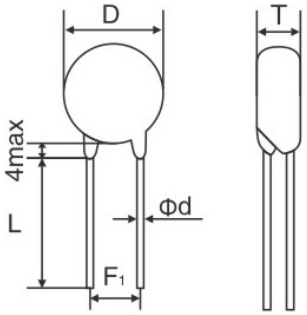
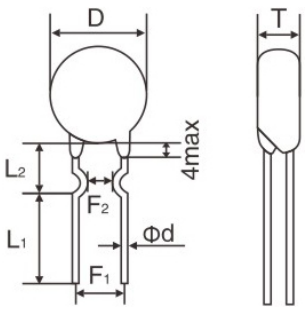
静态伏安特性
Static Characteristicse



VDK□D-13

产品外形 PRODUCT APPEARANCE

单位 Unit：mm

直线脚	内弯脚
	

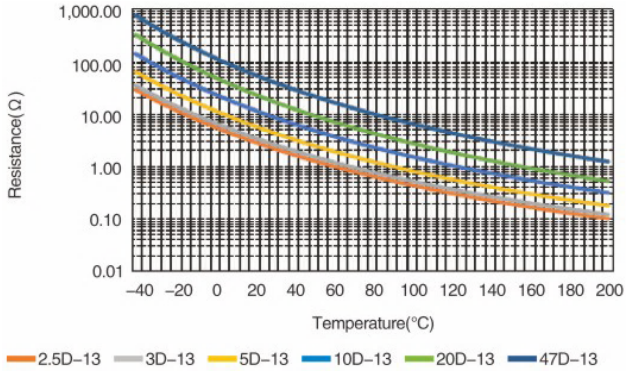
型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-13	15.5	6.0	0.75	7.5	5.0	3.0-20	3.0-20	7or4

主要技术参数 MAIN TECHNICAL PARAMETERS

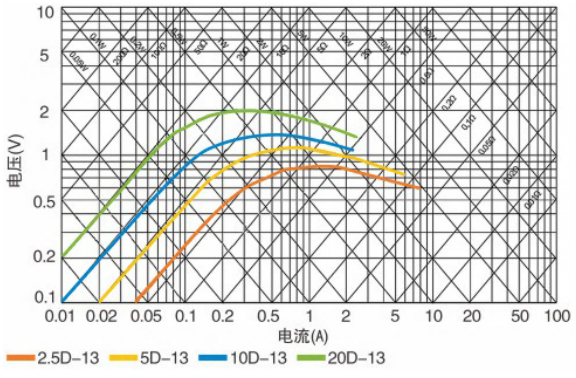
型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
2.5D-13	2.5	6	0.088	约 15	约 68	680/2700	2600	-40~+200	√	√	√
3D-13	3	6	0.092			680/2700	2600	-40~+200	√	√	√
4.7D-13	4.7	5	0.12			680/2700	2700	-40~+200	√	√	√
5D-13	5	5	0.125			680/2700	2700	-40~+200	√	√	√
8D-13	8	4	0.194			330/1200	2800	-40~+200	√	√	√
10D-13	10	4	0.206			330/1200	2800	-40~+200	√	√	√
16D-13	16	3	0.335			220/820	2800	-40~+200	√	√	√
18D-13	18	3	0.372			220/820	2800	-40~+200	√	√	√
20D-13	20	3	0.372			220/820	2800	-40~+200	√	√	√
30D-13	30	2.5	0.517			150/560	2950	-40~+200	√	√	√
47D-13	47	2	0.81			150/560	2950	-40~+200	√	√	√

说明：*表示参考值　　**Note：***Represents a reference value

产品阻温特性 Resistance-Temperature Characteristic



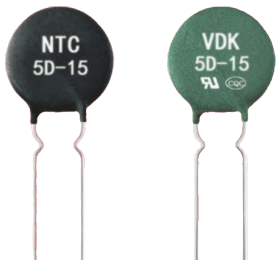
静态伏安特性 Static Characteristicse

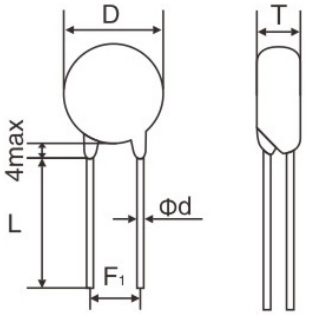
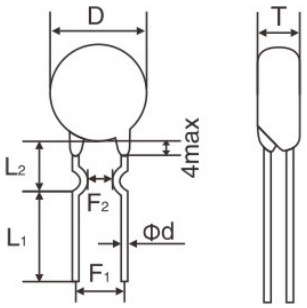


VDK□D-15

产品外形 PRODUCT APPEARANCE

单位 Unit：mm



直线脚	内弯脚
	

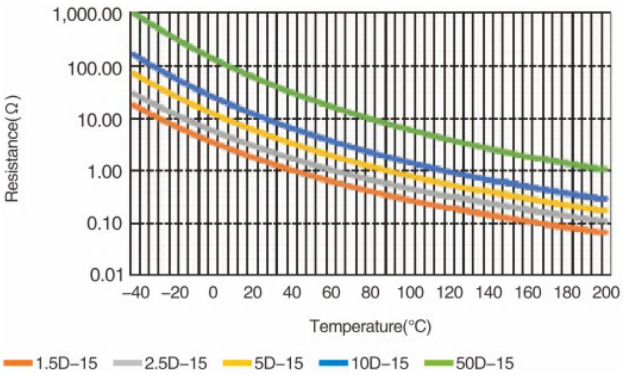
型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-15	17.5	6.0	0.75	7.5	5.0	3.0-20	3.0-20	7or4

主要技术参数 MAIN TECHNICAL PARAMETERS

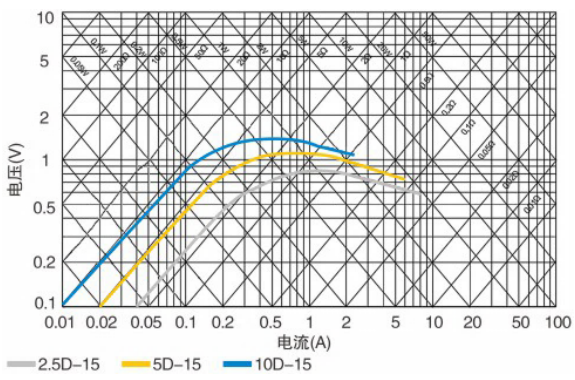
型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
1.5D-15	1.5	8	0.071	约 18	约 86	820/3300	2600	-40~+200	√	√	√
2.5D-15	2.5	8	0.071			820/3300	2600	-40~+200	√	√	√
3D-15	3	7	0.075			820/3300	2600	-40~+200	√	√	√
5D-15	5	6	0.112			680/2700	2800	-40~+200	√	√	√
7D-15	7	5	0.173			680/2700	2800	-40~+200	√	√	√
8D-15	8	5	0.178			680/2700	2950	-40~+200	√	√	√
10D-15	10	5	0.18			560/2200	2950	-40~+200	√	√	√
15D-15	15	4	0.268			560/2200	2950	-40~+200	√	√	√
16D-15	16	4	0.268			560/2200	2950	-40~+200	√	√	√
18D-15	18	4	0.288			330/1200	2950	-40~+200	√	√	√
20D-15	20	4	0.288			220/820	2950	-40~+200	√	√	√
30D-15	30	3.5	0.438			220/820	2950	-40~+200	√	√	√
47D-15	47	3	0.68			220/820	3200	-40~+200	√	√	√
50D-15	50	3	0.72			220/820	3200	-40~+200	√	√	√

说明：*表示参考值　　**Note：***Represents a reference value

产品阻温特性
Resistance-Temperature Characteristic



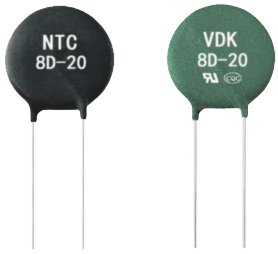
静态伏安特性
Static Characteristicse

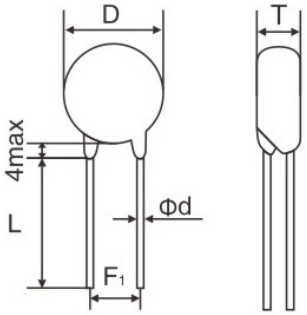
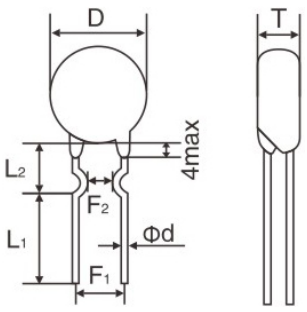


VDK□D-20

产品外形 PRODUCT APPEARANCE

单位 Unit：mm



直线脚	内弯脚
	

型号	最大直径 Dmax	最大厚度 Tmax	引线直径 Φd±0.05	间距 F1±1	间距 F2±1.5	直引线 L	引线长度	
							L_1±1	L_2±2
□D-20	22.5	7.0	1.0	10	8.0	3.0-20	3.0-20	7or4

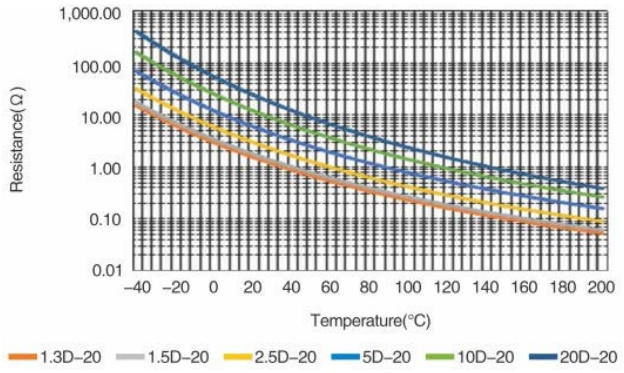
主要技术参数 MAIN TECHNICAL PARAMETERS

型号 Part NO	R25 (Ω)	最大稳态电流 Max steady State current (A)	残余电阻* Residusl Resistance (Ω)	耗散系数* Dissipation Factor (mw/° C)	热时间常数* Themal time Constant (s)	最大允许使用容量值 Maximum allowable capacity value 240V/120V (μF)	B 值 (K)	工作温度 Operating Temperature (° C)	认证		
									UL/ CUL	CQC	TUV
1.3D-20	1.3	9	0.037	约 24	约 113	820/3300	2600	-40~+200	√		√
1.5D-20	1.5	9	0.037			820/3300	2600	-40~+200	√		√
2.5D-20	2.5	8	0.055			820/3300	2700	-40~+200	√	√	√
3D-20	3	8	0.055			820/3300	2700	-40~+200	√	√	√
5D-20	5	7	0.087			820/3300	2800	-40~+200	√	√	√
8D-20	8	6	0.142			820/3300	2950	-40~+200	√	√	√
10D-20	10	6	0.162			820/3300	2950	-40~+200	√	√	√
16D-20	16	5	0.212			820/3300	3200	-40~+200	√	√	√
20D-15	20	5	0.212			820/3300	3200	-40~+200	√	√	√

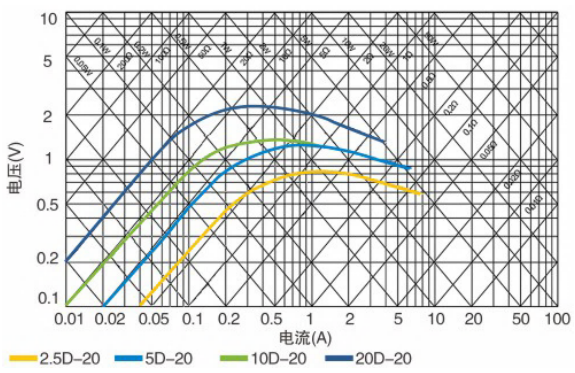
说明：*表示参考值

Note：*Represents a reference value

产品阻温特性 Resistance-Temperature Characteristic

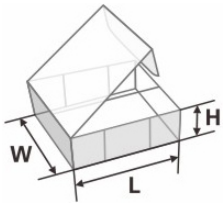
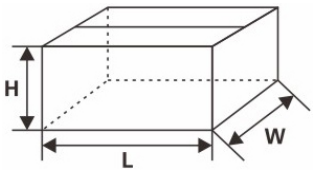


静态伏安特性 Static Characteristicse



散装 BULK

散装包装箱尺寸 BULK PACKING CASE SIZE

产品包装 PRODUCT PACKAGING	内盒 INSIDE THE BOX	外箱 CARTON
散装 In Bulk		
	260*210*55(L*W*H)	430*280*180(L*W*H)

散装包装数量 QUANTITY OF PACKING IN BULK

常规产品包装 NORMAL PRODUCT PACKAGING

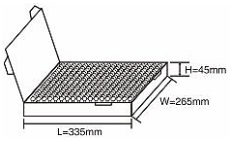
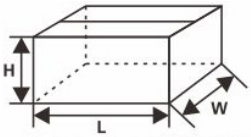
规格 DIMENSION	一袋 BAG	内盒 INSIDE THE BOX	外箱 CARTON
VDK□D-5	1000 pcs	3000 pcs	18000 pcs
VDK□D-7	1000 pcs	3000 pcs	18000 pcs
VDK□D-9	500 pcs	2000 pcs	12000 pcs
VDK□D-11	500 pcs	1500 pcs	9000 pcs
VDK□D-13	250 pcs	1000 pcs	6000 pcs
VDK□D-15	250 pcs	1000 pcs	6000 pcs
VDK□D-20	100 pcs	400 pcs	2400 pcs

常规产品包装 NORMAL PRODUCT PACKAGING

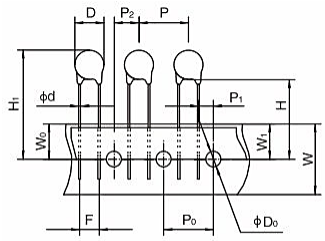
规格 DIMENSION	一袋 BAG	内盒 INSIDE THE BOX	外箱 CARTON
VDK□D-5	1000 pcs	8000 pcs	48000 pcs
VDK□D-7	1000 pcs	5000 pcs	30000 pcs
VDK□D-9	1000 pcs	4000 pcs	24000 pcs
VDK□D-11	1000 pcs	3000 pcs	18000 pcs
VDK□D-13	500 pcs	2000 pcs	12000 pcs
VDK□D-15	500 pcs	1000 pcs	6000 pcs
VDK□D-20	100 pcs	400 pcs	2400 pcs

编带 BRAID

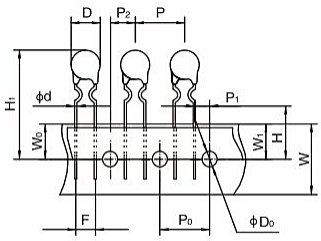
编带包装箱尺寸 SIZE OF WOVEN PACKING CASE

产品包装 PRODUCT ACKAGING	内盒 INSIDE THE BOX		外箱 CARTON	
编带 Taping			 540*360*295(L*W*H)	
每箱数量 Qty Per Box	产品数量(只) product quantity(pieces)	500/1000/1500	产品数量(只) product quantity(pieces)	6000/12000/18000

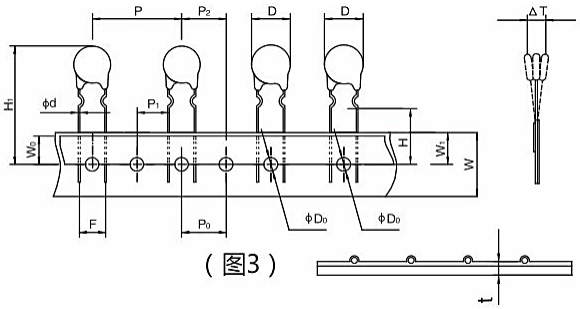
编带包装式样 PACKING STYLE



（图1）



（图2）



（图3）

编带尺寸 TAPE SIZE

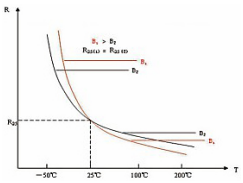
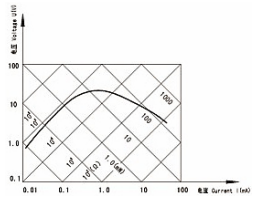
名称 DESCRIPTION	符号 SYMBOL	外观 EXTERIOR	产品直径 DIMENSION					
			ϕ5	ϕ7	ϕ9-ϕ11	ϕ13	ϕ15	ϕ20
编带间距 Taping pitch	P±1	直脚/弯脚	12.7	12.7	12.7/25.4	15/25.4	15/30	25.4
输送孔间距 Feed hole pitch	P0±1	直脚/弯脚	12.7	12.7	12.7/15	12.7/15	12.7/15	12.7
对输送孔的偏 Feed hole off alignment	P1±0.7	直脚/弯脚	3.75	3.75	3.75/8.95	3.75/8.95	3.75/8.95	7.7
	P2±1.3	直脚/弯脚	6.35	6.35	6.35/7.5/12.7	7.5/12.7	7.5/12.7	12.7
底部高度 Bottom height	H±1.0	直脚	19.0	19.0	19.0	19.0	19.0	19.0
		弯脚	18.0	18.0	18.0	18.0	18.0	18.0
顶部高度 Top henight	H1max	直脚/弯脚	29.0	32.0	36.0	40.0	40.0	/
载带宽度 Carrier tape width	W±1.0	直脚/弯脚	18.0	18.0	18.0	18.0	18.0	18.0
胶带宽度 Adhesive tape width	W0max	直脚/弯脚	10.0	10.0	10.0	10.0	10.0	10.0
对输送孔的高度偏移 Feed hole height off alignment	W1±0.5	直脚/弯脚	9.0	9.0	9.0	9.0	9.0	9.0
输送孔直径 Feed hole diameter	ϕD0±0.3	直脚/弯脚	4.0	4.0	4.0	4.0	4.0	4.0
本体直径 Body diameter	Dmax	直脚/弯脚	7.0	9.0	11.0/13.0	15.5	17.5	22.5
引线直径 Wire lead diameter	ϕd±0.003	直脚/弯脚	ϕ0.55	ϕ0.55	ϕ0.75	ϕ0.75	ϕ0.75/0.95	ϕ1.0
产品在胶带上偏差 Deviation across tape	ΔT max	直脚/弯脚	2.0	2.0	2.0	2.0	2.0	2.0
编带总厚度 Overall tape thichness	t±0.2	直脚/弯脚	0.7	0.7	0.7	0.7	0.7	0.7
引线间距 Lead spacing	F±1.0	直脚/弯脚	5.0	5.0	7.5/5.0	7.5	7.5	10.0

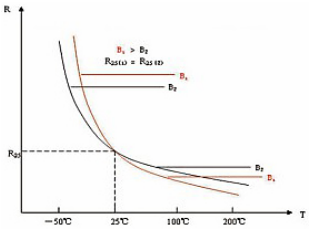
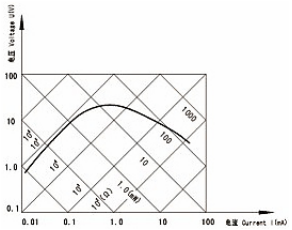
1.1 VDK 热敏电阻技术术语
VDK NTC THERMISTOR TECHNICAL TERM

项目	标准术语	测试设备	要求
额定零功率电阻值	在基准 25℃下测得的零功率电阻值，也称为 NTC 热敏电阻的标称电阻值。零功率电阻值 RT 是在规定温度下，采用引起电阻值变化相对于总的测量误差来说可以忽略不计的测量功率测得的电阻值。	HG-2515 型热敏电阻测试仪	电阻测量值在偏差允许范围内 M：±20% L：±15%定制
热敏指数 B 值(K)	B 值是负温度系数热敏电阻器的热敏指数，它被定义为两个温度下零功率电阻值的自然对数之差与这两个温度倒数之差的比值。 $B=\frac{Ln(R_{T1})-Ln(R_{T2})}{(1/T_1-1/T_2)}$ R_{T1}：温度为 T_1 时的零功率电阻值 R_{T2}：温度为 T_2 时的零功率电阻值 T_1=273.15+25（℃） T_2=273.15+50/85（℃）	HG-2515 型热敏电阻测试仪恒温油槽	符合规格书要求
耗散系数(δ)	在规定环境温度下，NTC 热敏电阻耗散系数是电阻体耗散的功率变化与电阻体相应的温度变化之比，即：$\delta=\frac{\Delta P}{\Delta T}$在工作温度范围内，$\delta$ 随环境温度变化而有所变化。 δ：NTC 热敏电阻耗散系数，（mW/K） ΔP：NTC 热敏电阻消耗的功率（mW） ΔT：NTC 热敏电阻消耗功率 AP 时，电阻体相应的温度变化（K）	耗散系数测试仪	见主要技术参数表
热时间常数(τ)	在零功率条件下，当温度突变时，热敏电阻本体的温度变化到始末两个温度差的 63.2%温度时所需的时间，热时间常数 τ 与 NTC 热敏电阻的热容量 C 成正比，与其耗散系数 δ 成反比，即： $\tau=C/\delta$ τ：热时间常数（S） C：NTC 热敏电阻的热容 δ：NTC 热敏电阻的耗散系数	热时间常数测试仪	见主要技术参数表

ITEM	STANDARD TERMINOLOGY	TEST EQUIPMENT	REQUIREMENT
Rated zero power resistance	In the standard 25℃ ambient conditions measured resistance values, namely NTC thermistor standard resistance values. Under the specified temperature induced resistance changes relative to the total measurement error is negligible in the measurement of the power measured resistance values.	HG-2515 thermistor tester	The measured resistance within the allowable M：±20% L：±15%(Customized)
B value (K)	B value stands for the thermal exponent at a negative temperature coefficient. It's defined as a ratio of the balance between the natural logarithms of resistance values at zero-power to the balance between the reciprocals of the two temperatures. The Formula is as below: $B=\frac{Ln(R_{T1})-Ln(R_{T2})}{(1/T_1-1/T_2)}$ R_{T1}：the zero power resistance at temperature T_1(K) R_{T2}：the zero power resistance at temperature T_2 (K) T_1=273.15+25（℃） T_2=273.15+50/85（℃）	HG-2515 thermistor tester Thermostatic oil bath	Comply with the specifications
Dissipation Factor	The dissipation factor is the ratio of the rate of change of the power consumption of a thermistor to the change of it's Corresponding temperature, namely: $\delta=\frac{\Delta P}{\Delta T}$ The value of δ will change for different ambient temperatures δ: NTC Thermistor dissipation factor, (mW/K) P: NTC Thermistor consumption power (mW) T: When the NTC thermistor consumption power is P, the corresponding change at resistor temperature (K).	Dissipation coefficient tester	See table of main technical parameters
Thermal time constant	The thermal time constant is a 63.2% change of thermistor's body temperature from its initial temperature to end temperature under zero power conditions. Thermal time constant is directly proportional to C, the heat capacity of thermistor, and is inversely proportional to δ, the dissipation constant. That is: Ƭ=C/δ Ƭ：Thermal time constant (S) C：The heat capacity of NTC thermistor δ：The dissipation factor of NTC thermistor	Thermal time constant test	See table of main technical parameters

1.2 VDK 热敏电阻技术术语
VDK NTC THERMISTOR TECHNICAL TERM

项目	标准术语	测试设备	要求
电阻-温度特性示意图	热敏电阻器的零功率电阻值与其电阻体温度之间的依赖关系。 	/	/
静态伏安特性示意图	静态伏安特性是指 NTC 热敏电阻器在建立了热平衡后电压与电流的关系，由于热敏电阻器的端电压与电流关系的变化幅度很大，其伏安特性曲线常用双对数坐标来表示。 	/	/
残余电阻	在标准测试条件下，通过热敏电阻器最大直流电流并达到热平衡时的电阻值。	稳态电流试验机	详见各规格产品技术参数表
最大允许容量	在负载状态下，与一个热敏电阻器连接的电容器的最大允许电容量值。	最大允许容量试验机	零功率阻值变化率≤±25%
最大稳态电流	在环境温度为 25℃时允许施加在热敏电阻器上的最大连续直流电流。	最大稳态电流试验机	外观无损伤，阻值变化率≤±25%

ITEM	STANDARD TERMINOLOGY	测试设备	要求
Resistance-temperature Characteristic Sketch map	RT characteristic is the relationship between zero-power resistance and body temperature of the thermistor. R-T curve of NTC thermistor 	/	/
Static characteristics Sketch map	Static volt-ampere characteristic refers to the NTC thermistor in the establishment of the heat balance in the relationship between voltage and current, the thermistor voltage and current relationship changes greatly, the volt-ampere characteristic curve is often double logarithmic coordinates. 	/	/
Residual resistance	At standard test conditions, the AC resistance when the current flow through a thermistor and reach thermal equilibrium.	Steady-state current testing equipment	Details see technical parameter table
Maximum allowable capacitance	Under load conditions, the maximum allowable capacitance is the value of capacitor, which connect with a thermistor.	The maximum allowed capacity equipement	Rated zero power resistance's change rate ≤± 25%
Max. steady state current	The maximum allowable continuous current allowed to pass through the thermistor at 25℃.	Maximum steady state current test machine	Appearance no damage, resistance change rate ≤± 25%

2 机械性能 MECHANICAL CHARACTERISTICS

指标项目	技术要求	测试条件/方法
可焊性	浸润部分上锡均匀，上锡面积≥95%	将引出端沾助焊剂后，浸入到温度为 240-245℃、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）
耐焊接	无可见损伤	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 265+5℃、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±2℃条件下恢复 4-5h 后，复测额定零功率电阻 RN'。
引出端强度	无损坏	根据 IEC68-2-21（GB2423.29）试验 U 进行试验。 试验 Ua：拉力 10N，持续 10S； 试验 Ub：弯曲 90°，拉力 5N，持续 10S； 扭转 180°，拉力 5N，持续 10S。 在 25±2℃条件下恢复 4-5h 后，复测额定零功率电阻 RN'。

ITEM	SPECIFICATION	TEST CONDITIONS & METHODS
SOLDER-ABILITY	The terminals shall be uniformly tinned, and its area≥95%	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 240-245℃ and to the place of 6mm far from NTC body for2-3s(See IEC68-2-20 /GB2423.28 Ta)
RESISTANCE TO SOLDERING HEAT	No visible mechanical damage. △R/RN≤20% (△R=|RN-RN`|)	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 265±5℃ and to the place for 6mm below from NTC body for 10±1s. After recovering4-5h under 25±2℃. The rated zero power resistance value RN' shall be measured. (See IEC68-2-20 /GB2423.28 Tb)
STRENGTH OF LEAD TERMINAL	No break out △R/RN≤20%(△R=|RN-RN`|)	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 4-5hunder 25+2℃, the rated zero power resistance value RN' shall be measured.(See IEC68-2-21/GB2423.29 Ua /Ub)

3 电气性能/测试条件/方法
ELECTRICAL CHARACTERISTICS &TEST CONDITIONS&METHOD

指标项目	技术要求	测试条件/方法
额定零功率电阻	电阻测量值在偏差允许范围内： M：±20% L：±15%定制	环境温度 TA：25℃±1℃ 测试电压：1.5VDC 在恒温 TA 条件下，放置 1~2 小时后测得阻值 RN。
热耗散系数 δ(MW/℃)	见主要技术参数表	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（△P）与本体温度变化量（△Ƭ）的比值。
热时间常数 Ƭ(S)	见主要技术参数表	热时间常数（Ƭ）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。
材料常数	见主要技术参数表	R1，R2 分别为 T1，T2 温度下的零功率电阻 T1=298.15 K（25℃） T2 = 323.15 K（50℃）
最大稳态电流 (A)	无可见损伤	环境温度：25℃±2℃ 见主要技术参数表

ITEM	SPECIFICATION	TEST CONDITIONS & METHODS
RATED ZERO-POWERRESISTANCE RN(Ω)	The resistance measurement value is within the allowable range of deviation: M:±20% L:±15%(Customized)	Ambient temp. Range:25℃+1℃(TA). Testing voltage: 1.5VDC After placing for 1-2 hours under TA, the resistance value shall be measured
THERMAL DISSIPATIONCONSTANT	See the main technical parameter list	The thermal dissipation constant(δ) could be calculated by the ratio of a change in power dissipation (△P) of the thermistor to a change in temperature (△T) of the thermistor at a specified ambient temperature
THERMAL TIME CONSTANT	See the main technical parameter list	The time (Ƭ 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
MATERIAL CONSTANT B	See the main technical parameter list	R1,R2 is zero-power resistance at T1,T2 T1=298.15 K(25℃) T2=323.15 K(50℃)
MAX.STEADY STATE CURRENT	VISIBLE MECHANICAL DAMAGE. △$R_N/R_{N'}$≤20%(△R=|R_N-$R_{N'}$|)	Ambient temp. Range. 25℃±2℃ Testing Current. See the main technical parameter list

4 可靠性试验（周期性检测项目）
RELIABILITY TEST (PERIODIC TEST ITEMS)

指标项目	技术要求	测试条件/方法
温度循环测试	无可见损伤	在 Ta=-40±3℃和 Tb=200±3℃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±2℃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±2℃）4-5 小时后测量零功率电阻 RN'。
电循环测试	无可见损伤	环境温度：25℃±2℃。 循环次数：1,000 次 通/断：1 分钟/5 分钟 测试电流：最大稳态电流（A） 样品置于室温（25±2℃）4~5 小时后，测量其零功率电阻 RN'。
持久性测试	无可见损伤	环境温度：25℃±2℃。样品通过最大工作电流 1,000±24 小时后，取出置于室温（25±2℃）4~5 小时后，测量其零功率电阻 RN'。
耐湿性测试	无可见损伤	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±2℃）4~5 小时后，测量其零功率电阻 RN'。

ITEM	SPECIFICATION	TEST CONDITIONS & METHODS
TEMP. CYCLING TESTING	No visible mechanical damage. △ $R_N/R_{N'}$≤20%(△ R=|R_N-$R_{N'}$|)	Ta:-40±3℃/30min→25±2℃/5min→Tb:200±3℃/30min →25±2℃/5minCycles:5times After recovering 4-5 h under 25±2C, the rated zero power resistance value RN' shall bemeasured.
ELECTRICAL CYCLING TESTING	No visible mechanical damage. △ $R_N/R_{N'}$≤20%(△ R=|R_N-$R_{N'}$|)	Ambient temp. Range: 25℃±2℃. Cycles: 1,000times On /Off: 1m /5m Test Current: MAX. STEADY STATE CURRENT After recovering 4-5h under 25±2℃, the rated zero power resistance value RN' shall be measured.
LOADLIFE (ENDURANCE) TESTING	No visible mechanical damage. △ $R_N/R_{N'}$≤20%(△ R=|R_N-$R_{N'}$|)	Ambient temp. Range:25 ℃ ± 2 ℃ ; 1,000 ± 24h After recovering 4~5 h under 25±2℃, the rated zero power resistance value RN' shall be measured.
HUMIDITY TESTING	No visible mechanical damage. △ $R_N/R_{N'}$≤20%(△ 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 RN' shall be measured

NTC热敏电阻注意事项

请遵循以下事项，否则可能会造成 NTC 热敏电阻损坏，使用设备损伤或引起误动作等后果。

1、请勿在使用温度范围以外使用，请勿施加超出使用温度范围上下限的急剧温度变化。

2、请在额定功率条件下使用 NTC 热敏电阻。各规格最大额定功率为中 ϕ5—0.7W ϕ7－1.2W ϕ9－1.9W ϕ11—2.3W ϕ13—3W ϕ15—3.5W ϕ20—4W。

3、在高湿高温环境下使用护套型 NTC 热敏电阻时应采取仅使护套封闭部分暴露于环境（水中、湿气）中，而护套开口部分不会直接接触到水及蒸汽的设计。

4、配线时应确保导线端部（含连接器）不会深入水、蒸汽、电解质液等否则会造成接触不良。

5、请勿在腐蚀性气体的环境（C12、NH3、SOx、NOx）以及会接触到电解质液、盐水、酸、碱、有机溶剂的场所中使用。

6、请勿过度拉伸及弯曲导线，请勿施加过度的振动、冲击及压力。

7、金属腐蚀可能会造成设备功能故障，故在选择材质时应确保金属护套型及螺钉紧固型 NTC 热敏电阻与安装的金属件之间不会产生接触的电位差。

8、功率型 NTC 周围应避免安装发热和易燃元件，建议选用弯脚上部引线较高的产品，使 NTC 热敏电阻在线路板上高出其它元件，以免发热影响其它元件正常工作。

9、NTC 热敏电阻是按不同的功能用途分别进行设计的，如有疑问可与我司联络。

MATTERS NEEDING ATTENTION FOR NTC THERMISTORS

Please follow the rules listed below when using NTC thermistors. Otherwise, you may cause damage to the NTC thermistor and relevant equipment or hurt yourself.

Do not use the thermistor under temperature beyond the operating temperature range. Do not apply rapid temperature changes which exceed the upper and lower limits of the operating temperature range.

Please use the NTC thermistor under the standard power. The maximum standard powers of each specification are: ϕ5—0.7W ϕ7 — 1.2W ϕ9 — 1.9W ϕ11—2.3W ϕ13—3W ϕ15—3.5W ϕ20—4W.

When using the sheath type NTC thermistors in the high humidity and high temperature environment, the sealing part of the sheath should be exposed to the environment (moisture or water) while the opening part of the sheath is not directly exposed to the water or steam.

When wiring, the ends of the wire (including connectors) should not be posited deeply inside water, steam. electrolyte solution, etc. Otherwise, it will result in poor contact.

Please do not expose the thermistor to corrosive gas (NH3, SOx, NOx, Cl2) or any saline solution, acid solution, alkaline solution and electrolyte solution.

Do not over stretch or bend the wire. Please do not apply excessive vibration, pressure and impact on the thermistor. To avoid equipment faults caused by metal corrosion, please choose the right material to make sure there is no potential difference at the contact point between metal sheath type or screw fastening type NTC thermistor and the metal components.

Do not install any flammable component or component generating heat surrounding the power type NTC Our recommendation is to avoid the negative effect brought by the heat from the NTC, please use products with higher lead wire on the bending feet to make the NTC thermistor on the circuit board higher than the other components. NTC thermistors have specific designs for different functions. Feel free to contact us if you have any question.

附录

参数定义

热敏电阻器

其首要特性是随着阻体温度的变化，电阻值呈现显著变化的热敏感半导体电阻器。

负温度系数热敏电阻器(NTC)

温度升高时，电阻值下降的热敏电阻器。

最大允许电容量

在负载状态下，与一个热敏电阻器连接的电容器的最大允许电容量值。

剩余电阻值

当热敏电阻器上流过最大电流并达到热平衡时的直流电阻值。以欧姆(Ω)表示。

冲击电流

比如已放电的电容器，已冷却的灯丝或者一个静止的马达等等，有极低的起始阻抗，当负载的初期有较高的初始电流称为冲击电流。

零功率电阻

在规定温度下测得的热敏电阻器的直流电阻值。

25℃环境温度下的最大电流

在 25℃环境温度下，可以连续施加在热敏电阻器上的电流（直流或正弦波交流有效值）最大值。

耗散系数

使热敏电阻器的温度升高 K 所需消耗的功率。通常为规定的环境温度下功耗变化与热敏电阻器阻体温度变化之比。通常以(mW/℃)表示。

热时间常数

在规定的介质中，热敏电阻器自热后冷却其温升的 63.2%所需要的时间（单位为 S)。

B 值

NTC 热敏电阻在某一温度之电阻与另一温度之电阻的比较值，可由下面的公式计算得到。材料常数是 R1,R2 分别为 T1,T2 温度下的零功率电阻 T1=298.15K(25℃)
T2=323.15K(50℃)
B=Ln(R1/R2)/(1/T1-1/T2)

冲击能量

热敏电阻能承受最少 6000 次而电阻值变化率在±20%以内之冲击能量。此能量与所加之电压及电容值有关。

APPENDIX

PARAMETER DEFINITION

Thermistor
The primary characteristic of a thermally sensitive semiconductor resistor is with a significant change in resistance as the resistance body temperature changes.

Negative temperature coefficient
A thermistor exhibits a decrease in resistance when temperature rises.

Maximum allowable capacitance
The maximum allowable capacitance of a capacitor connected to a thermistor in a load state.

Residual resistance
The DC resistance when the maximum current is passed through the thermistor and the thermal balance is reached. Expressed in ohms(Ω).

Impact current
For example, a capacitor that has been discharged, a cooled filament, or a stationary motor, etc., has a very low initial impedance, and when the initial stage of the load has a higher initial current, it is called an impact current.

Zero-power resistance
The DC resistance of a thermistor measured at specified temperature.

Max. current at25℃ambient temperature
At25 ℃ ambient temperature, the maximum value of current(DC or sinusoidal AC RMS)that can be applied continuously on a thermistor.

Dissipation factor
The power required to increase the temperature of a thermistor by 1K.it is the ratio of the change in power consumption to the temperature of the thermistor body at the specified ambient temperature. Expressed in mW/℃.

Thermal time constant
In a specified medium, the time required for the thermistor to cool its temperature rise by 63.2%after heating itself (the unit is S)

B constant
B=Ln(R1/R2)/(1/T1-1/T2)
A comparison of the resistance of a NTC thermistor at a temperature to that of another, which can be calculated by the below formula. The material constants R1,R2 are zero-power resistances at T1 and T2 respectively.T1=298.15K(25℃)　T2=323.15K(50℃)
B=Ln(R1/R2)/(1/T1-1/T2)

Impact energy
Thermistors can withstand impact energy at least 6000 times, while resistance rates change within ±2%.This energy is related to the added voltage and capacitance.