

KNP 插件线绕固定电阻器 Wire-wound Fixed Resistor	文件编号 Document No.	YF-SE-02-04A/A00
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■ **产品特性 Product Feature**

- 低功率、体积小、阻值范围广
Low power, small size, wide resistance range;
- 性能稳定、高频特性好、抗脉冲性
Stable performance of high voltage, pulsing load;
- 符合环保要求
RoHS compliant, halogen free, lead free;
- 防护等级 INGRESS PROTECTION: IP50;

■ **产品引用范围 Application**

- 家电/音响系统 Entertainment system;
- 工业/自动化行业 Industrial/automation system;
- 仪器/仪表设备 Meter/Instruments;

■ **产品订货方式 Parts Number Explanation**

KNP	-	1W	-	470R	-	J	-	TB		
类型		功率		特征		阻值		误差		包装
Product Type		Rated Power		Feature (Optional)		Resistance		Tolerance		Packing
		1/2W		N/A:Normal		0R47=0.47Ω		D:±0.5%		TB: Belt type
		1W		S:Small volume		2R7=2.7Ω		F:±1%		P: Bulk type
		2W		L:Large volume		15R=15Ω		G:±2%		F: Vertical form
		3W		N:Non-inductive		510R=510Ω		J:±5%		M:Horizontal
		5W		...		1K2=1.2KΩ		K:±10%		FK: Vertical with pink
		...								MK: Horizontal/Pink
		25W								...

■ **环保申明 RoHS declaration:**

本产品符合 RoHS 2.0(2011/65/EU)环保要求。
 The products meet the standards of RoHS 2.0(2011/65/EU).

■ **参考标准 Reliability standard**

可焊性 Weldability Standard:	IEC60068-2-20
环境标准 Environment Standard:	SJ/T 11363-2006, ROHS 2011/65/EU
检验标准 QC standard:	MIL-STD-105E, GB/T 2828.1-2003
产品性能 Performance:	IEC60115-2008, GB/T5729-2003

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■ 产品电压参数 Product voltage parameters

功率 Rated Power At 70°C	最高使用电压 Max. Rating Voltage(U _R)	最高超载电压 Max. Overload Voltage(U _L)	绝缘电压 Insulation Voltage(U _N)	温度系数 T.C.R. (PPM/°C)	工作温度 Operating Temperature
1/2W	150V	250V	300V	T50: ±50 T100: ±100 T200: ±200 T350: ±350 T500: ±500	-55°C ~ +275°C
1W	200V	300V	300V		
2W	250V	400V	400V		
3W	350V	500V	500V		
5W, 6W	500V	650V	500V		
7W, 8W	500V	750V	500V		
10W	650V	1000V	500V		
P>10W	650V	1000V	500V		

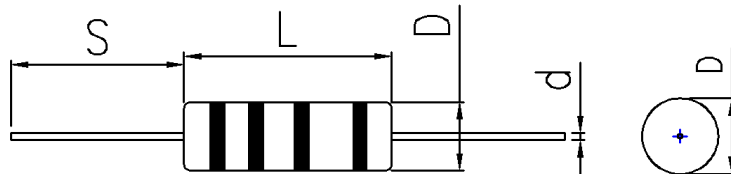
● 额定电压 Rating Voltage:

额定功率对应的额定电压,直流(DC)或交流电流(AC),可以采用如下公式计算。当计算的额定电压超过最高使用电压时,则使用最高使用电压为额定电压。

The following equation may be used to determine the DC(Direct Current) or AC(Alternating Current)(RMS, root mean square value) of normal rated power. However, if the result value exceeds the max. using voltage, the max. using voltage is to be used:

$U_P = \sqrt{P \times R}$	U _P : 额定电压 Rating voltage (V) P: 额定功率 Rating Power (W) R: 电阻值 Resistance(Ω)
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■ 产品尺寸 Type dimension



额定功率 Rating Power	阻值 Resistance	尺寸 Dimension(mm)				备注 Remarks	
		L±1.0	D±0.5	d±0.05	S±2.0	颜色 Color	单重 N.W.
1/2W, 1WS	0.1Ω~100Ω	9.5	3.3	0.55	26	灰色 Gray	-
1W, 2WS	0.1Ω~220Ω	11.5	4.5	0.65	28	灰色 Gray	-
2W, 3WS	0.1Ω~330Ω	15.2	5.2	0.75	32	灰色 Gray	-
3W, 5WS	0.1Ω~470Ω	17.0	6.0	0.75	32	灰色 Gray	-
5W, 6W	0.1Ω~1KΩ	24.0	8.0	0.75	35	绿色/灰色	-
7W, 8W	0.2Ω~2KΩ	32	8.0	0.75	35	绿色 Green	-
10W	0.5Ω~5KΩ	35	8.0	0.75	35	绿色 Green	-
12W	0.5Ω~5KΩ	42	8.0	0.75	30	绿色 Green	-
15W	0.5Ω~5KΩ	47	8.0	0.75	30	绿色 Green	-

注 Remarks: 部分产品可以根据要求定制 Some product can be customized.

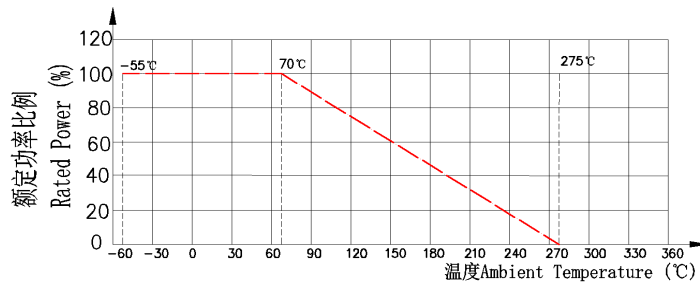
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■ 产品特性 Product performance

● 额定功耗 Power Derating Curve

额定功率是周围温度 70℃ 以下(推荐工作区域), 可连续使用的负载功率的最大数值, 且应使机械性能与电气性能满足. 如周围温度超过 70℃ 时, 依照下图功率衰减曲线而定。

Rated power is the max using power under 70℃ and continuous duty. At the same time, the overload power is fit for mechanical properties and electrical properties. When the temperature is over 70℃, the power must be derated in accordance with the curve as below:



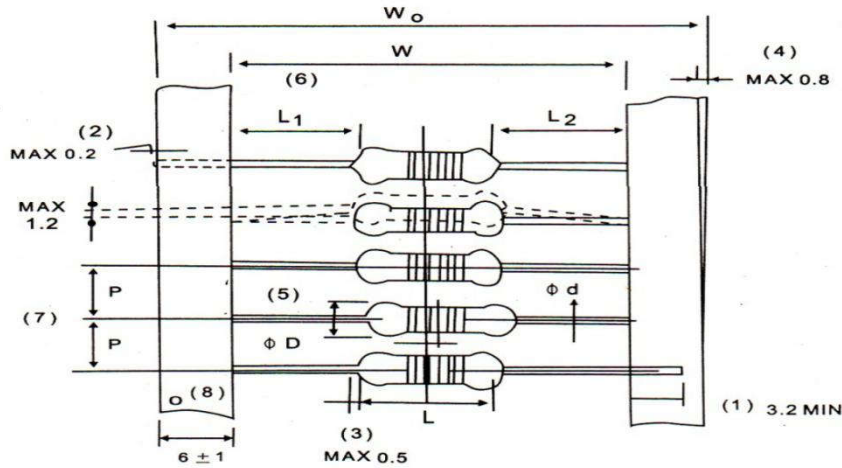
● 产品特性 Product reliability performance

测试项目 Test Item	测试方法 Test Method	测试方法 Procedure	测试标准 Requirements										
端子强度 Terminal Strength	IEC60115-1 4.33	端子加载 20N 拉力, 时间 10 秒; Pressurizing force:20N, 10 seconds	无损坏 No damage										
本体强度 Body strength	IEC60115-1 4.15	电阻体中间, 加载 5N 的压力, 时间 10 秒 Central part pressurizing force:5N, 10seconds	无损坏 No damage										
耐振性 Vibration	IEC60115-1 4.22	10~55HZ/0.75mm/2H*3											
耐焊锡热 Soldering Heat	IEC60115-1 4.18	260±5℃, 10S	△R/R ≤ ±0.5%										
可焊锡性 Solderability	IEC60115-1 4.17	245±5℃, 2±0.5S	≥95%										
温度系数 Temperature coefficient (T.C.R.)	IEC60115-1 4.8	$T.C.R. = \frac{R - R_0}{R_0} \times \frac{1}{T - T_0} \times 10^6 \text{ (PPM/°C)}$ R ₀ : 常温下(T ₀)的阻值 Resistance at room temperature(T ₀); R: 测试温度(T=T ₀ +100)的阻值 Resistance at T=T ₀ +100;	根据产品额定参数 Refer to Ratings										
短时间过负载 Short Time Overload	IEC60115-1 4.13	Min($\sqrt{10 \times W \times R}$, U _R), 5s	△R/R ≤ ±2.0%										
绝缘耐压 Withstanding voltage	IEC60115-1 4.7	U _N , 60S, I ≤ 2mA.	△R/R ≤ ±0.5%										
绝缘阻值 Insulation resistance	IEC60115-1 4.6	DC500V, R > 100MΩ	△R/R ≤ ±0.5%										
耐久性 Endurance	IEC60115-1 4.25	Min(U _P , U _R), 1.5H- ON, 0.5H-OFF, 1000H	△R/R ≤ ±5%										
高温存储 High Temperature Exposure	IEC60115-1 4.23	125℃, 80%, 500H	无损伤 No damage										
温度循环 Temperature Cycle	IEC60115-1 4.19	下循环 Cycle Below: <table border="1" style="margin-left: 20px;"> <tr> <td>温度 Temperature</td> <td>25℃</td> <td>150℃</td> <td>25℃</td> <td>-55℃</td> </tr> <tr> <td>时间 Duration</td> <td>15min</td> <td>15min</td> <td>15min</td> <td>15min</td> </tr> </table> 持续时间 Cycle Time:1000Hrs.	温度 Temperature	25℃	150℃	25℃	-55℃	时间 Duration	15min	15min	15min	15min	无损坏 No damage △R/R ≤ ±0.5%
温度 Temperature	25℃	150℃	25℃	-55℃									
时间 Duration	15min	15min	15min	15min									
不燃特性 Noninflammability	UL94-V0	16*U _P , 5min,	无燃烧现象 No flame										

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■ 包装尺寸 Package dimensions:

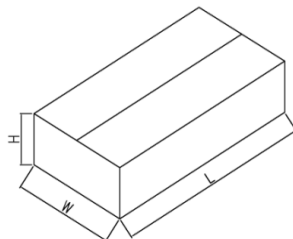
● 编带包装 Taping belt(TB)



1. 位于胶带内导线长度.Total length of the resistors within the belts
2. 突出于胶带外线导线 The tail length outside the belts
3. 涂装于导线长度 Painted length on the tail
4. A 胶带与 B 胶带位置之差异 Location difference between A belt and B belt
5. 电阻中心点位置之误差 Shift tolerance of the resistors center
6. 两端导线长度差不超过 1.5mm/ Difference between L1 and L2 is less than 1.5mm
7. 两个电阻体之间的距离. Distance of two resistance
8. 每 50/100 个电阻于胶带打孔做记号 Make marks by every 50/100pcs

额定功率 Power	最小包装 MPQ	带状尺寸 Lead taping Dimensions (mm)						
		L±1.0	D±0.5	d±0.05	P±1.0	W±2	W0±2	(L1/L2)±2
1/2W,1WS	2,000	9.5	3.3	0.55	5	52	64	21
1W,2WS	1,000	11.5	4.5	0.65	5	58	70	23
2W,3WS	1,000	15.2	5.2	0.75	10	72	84	28
3W,5WS	500	17.0	6.0	0.75	10	72	84	28
5W	250	24.0	8.0	0.75	10	85	96	30

● 散装包装 Bulk package(P):



尺寸 Dimension (mm):

L	270±5.0
W	165±3.0
H	110±3.0
MPQ	50 PCS
Qty	500 PCS