

1. 一般事項 **General**

1.1 適用 Scope

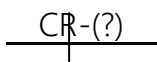
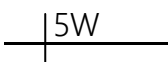
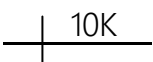
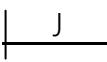
深圳市晓佳实业有限公司 製造之[水泥型電阻器]，符合環境關聯物質要求之 RoHS 測試。

This specification is available for Cement Type Resistors manufactured by SHENZHEN GRANDEARN INDUSTRIAL CO.,LTD, it accords with RoHS test of Environment related substance requirement.

1.2 形名(例) Type designation (example)

依使用種類、額定電力、公稱電阻值、容許誤差而區別,其構造如下。

The type designation shall be in the following form and as specified.

			
--	--	--	--

種 類	額定電力	公稱電阻值	<table><tr><td colspan="2">電阻值容許誤差</td></tr><tr><td colspan="2">Resistance tolerance</td></tr><tr><td>K</td><td>±10%</td></tr><tr><td>J</td><td>±5%</td></tr><tr><td>G</td><td>±2%</td></tr></table>	電阻值容許誤差		Resistance tolerance		K	±10%	J	±5%	G	±2%
電阻值容許誤差													
Resistance tolerance													
K	±10%												
J	±5%												
G	±2%												
Type	Rated power	Nominal resistance value											
CR-L	2W												
CR-M	3W	E-12 Series											
CR-YA	5W	E-24 Series											
CR-YB	7W												
CR-TC	10W												
CR-YD	15W												
CR-YD1	20W												
CR-YE	30W												
CR-YG	40W												
CR-V													

1.3 額定電力 Rated power

額定電力係應在周圍溫度 70℃可以連續負載的最大電力，

1.3 額定電力 Rated power

額定電力係應在周圍溫度 70℃可以連續負載的最大電力，如表-1;但周圍溫度如超過 70℃

時之額定電力則依圖一的電力遞減曲線實施。

Rated power is maximum power which can be continuously loaded at specified ambient temperature

70℃,as Table-1;however when the ambient temperature exceeds 70℃,rated power should be determined

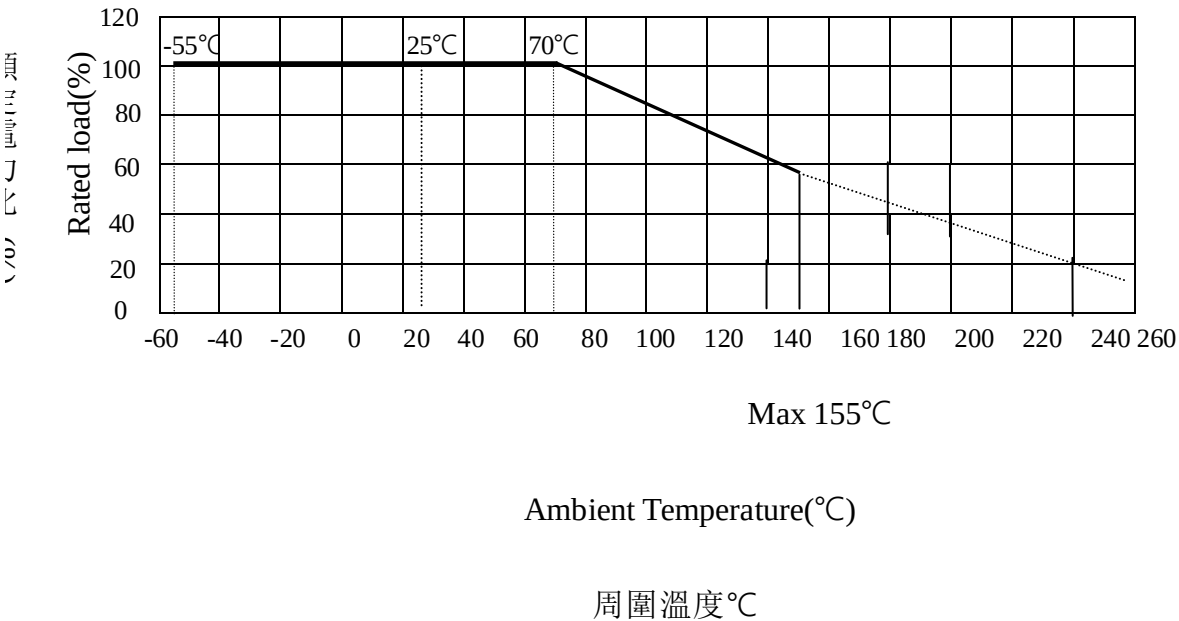
from the derating curve of Fig.1.

表-1 Table-1

定格電力 Rated power	最高使用電壓 Maximum working voltage	最高過負荷電壓 Maximum overload voltage	介質耐電壓 Dielectric withstanding voltage	最高斷續過負荷電壓 Max Intermittence Overload Voltage
1W	350V	700V	1000V	1500V
2W	350V	700V	1000V	1500V
3W	500V	1000V	1000V	1500V
5W	750V	1500V	1000V	1500V
7W	1000V	1500V	1000V	1500V
10W	1000V	1500V	1000V	1500V
15W	1000V	1500V	1000V	1500V
20W	1000V	1500V	1000V	1500V
30W	1000V	1500V	1000V	1500V
40W	1000V	1500V	1000V	1500V

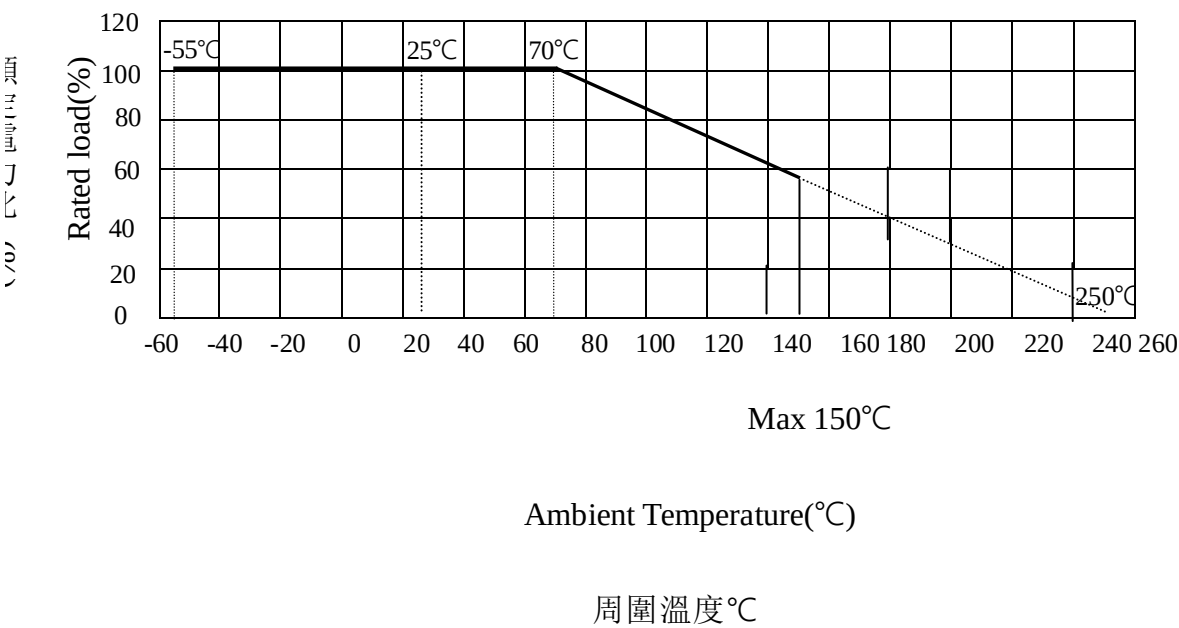
圖一 電力遞減曲線 Figure 1 Power derating curve

線繞型水泥電阻 Wire Wound Cement Type



(定格周圍溫度:	1W~10W	70℃
	15W 以上	25℃)
(Rated ambient temperature:	1W~10W	70℃
	15W or more	25℃)

金屬氧化皮膜水泥電阻 Metal Oxide Film Cement Type



(定格周圍溫度:	1W~10W	70°C
	15W 以上	25°C)
(Rated ambient temperature:	1W~10W	70°C
	15W or more	25°C)

1.4 額定電壓 Rated voltage

額定電壓係指對應於額定電力的直流或交流(商用頻率之有效值)的電壓,由下式求得。

The rated voltage shall be the D.C. or A.C.(R.M.S. at power frequency) voltage which corresponds the rated power and the value of which is calculated from the formula below.

$$E=\sqrt{(P\times R)}$$

Where

E: 定格電壓

Rated voltage(V)

P: 定格電力

Rated power(W)

R: 公稱電阻值 Nominal resistance(Ω)

2. 構造 Construction

2.1 外形尺寸 External dimensions

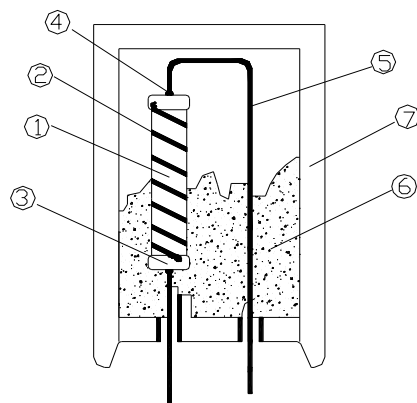
參照本承認書的 [5. 外形尺寸]。

The dimensions shall be satisfied with [5. External dimensions].

2.2 構造圖 Structure diagram

CR- (?) 系列之水泥固定電阻器係按下表的材料而構成：

The construction of resistor Cement Type Resistors shall be as follow:



號碼 NO	構造名稱 Item	內 容 Material
1	基體磁器 Ceramic core	使用高含鋁量的磁器棒。 High alumina ceramic is used.
2	電阻體 Resistor element	電阻體的成份係使用金屬氧化皮膜或電阻線(例如：CN49W Φ1.0mm)。 The resistor element shall consist of metal oxide film or Resistance wire (Exemple:CN49W Φ1.0mm) .
3	端子 Terminal	鐵帽 Tinned iron cap.
4	連接 Connection	導線對鐵帽須以電氣熔接。 The lead wire,which is plated with solder,shall be mounted to the caps by welding process.

5	導線 Lead wire t	焊錫或鍍錫的導線。 Soldered or tinned annealed wire.
6	矽水泥 Silicon cement	使用矽樹脂。符合 UL-94V-0 不然性規定 Silicon resin is used. Accord with UL-94V-0 Nonflammable specification
7	磁殼 Ceramic case	高頻陶瓷器 High thermal conductivity

3. 特性 Characteristics

表-2 Table-2

項 目 Item	規格值 Performance	試驗方法(依據 JIS C 5202) Test methods(Conform to JIS C 5202)
溫度係數 Temperature Coefficient	金屬氧化皮膜:±350PPM/°C Metal Oxide Film: ±350PPM/°C 電阻線: ±260PPM/°C Resistor Wire: ±260PPM/°C	5.2 項參照 Comply with 5.2 $\frac{R_1 - R_0}{R_0(T_1 - T_0)} \leq \pm 0.0035 / ^\circ\text{C}$ R ₀ :室溫(T ₀)所測量之電阻值。 R ₁ :室溫+100°C(T ₁)後所測量之電阻值。 R ₀ :Resistance value at room temp.(T ₀). R ₁ :Resistance value at room temp.plus 100°C (T ₁)
短時間過負荷 Short time overload	±(2%+0.05Ω)以內。 不得有機械的損傷。 Within ±(2%+0.05Ω). No evidence of mechanical damage.	5.5 項參照 Comply with 5.5 定格電力×10 倍,5 秒。 不可超過最高過負荷電壓(見表-1) Rated power×10 times,5s But not to exceed maximum overload voltage. (See table-1)
絕緣電阻 Insulation Resistance	10 ³ MΩ以上。 10 ³ MΩ or more.	5.6 項參照 Comply with 5.6 施加直流電壓 500V 60 秒。 Resistor shall be tested at DC 500V for 60 seconds.
耐電壓 Dielectric Withstanding Voltage	無電弧放電、燒損及絕緣破 壞等異狀。 No evidence of flashover mechanical damage,arcing	5.7 項參照 Comply with 5.7 施加個別規定之交流電壓 60 秒。(見表-1) Resistor shall be tested at AC potential respectively for 60 seconds.

	or insulation breakdown.	(See table-1)
斷續過負荷 Pulse overload	±(2%+0.05Ω)以內。 Within ±(2%+0.05Ω)	5.8 項參照 Comply with 5.8 額定電壓×4 倍,10000 回(1 秒 ON,25 秒 OFF)。 不可超過最高斷續電壓(見表-1) Rated voltage X 4 times, 10000 cyc.(1s ON, 25s OFF) But not to exceed maximum pulse voltage. (See table-1)
項 目 Item	規格值 Performance	試驗方法(依據 JIS C 5202) Test methods(Conform to JIS C 5202)

焊錫耐熱性 Resistance to soldering heat	$\pm(1\%+0.05\Omega)$ 以內。 不得有機械的損傷。 Within $\pm(1\%+0.05\Omega)$ No evidence of mechanical damage.	6.4 項參照 Comply with 6.4 $350\pm 10^{\circ}\text{C}$, 3 ± 1 秒, 試驗後放置半小時。 $350\pm 10^{\circ}\text{C}$, $3\pm 1\text{s}$ After test leave for 0.5h.
焊錫附著性 Solderability	導線至少 95%以上新錫覆蓋。 Covered with new solder by 95% at least.	6.5 項參照 Comply with 6.5 焊錫溫度： $255\pm 5^{\circ}\text{C}$ 。 浸錫時間： 3 ± 1 秒。 Test temperature of solder: $255\pm 5^{\circ}\text{C}$ Dipping time in solder: $3\pm 1\text{s}$
溫度循環 Temperature cycle	$\pm(2\%+0.05\Omega)$ 以內。 不得有機械的損傷。 Within $\pm(2\%+0.05\Omega)$ No evidence of mechanical damage.	7.4 項參照 Comply with 7.4 低溫側： $-55^{\circ}\text{C}/30$ 分, 室溫： $10\sim 15$ 分鐘 高溫側： $+80^{\circ}\text{C}/30$ 分, 室溫： $10\sim 15$ 分鐘 5 回 Low side： $-55^{\circ}\text{C}/30\text{min}$, Room temp.： 10 to 15min High side： $80^{\circ}\text{C}/30\text{min}$, Room temp.： 10 to 15min 5 cycles
耐濕負荷壽命 Load life in humidity	$\pm(5\%+0.05\Omega)$ 以內。 Within $\pm(5\%+0.05\Omega)$	7.9 項參照 Comply with 7.9 $40\pm 2^{\circ}\text{C}$, 濕度 $90\sim 95\%$, 1000 小時 定格電壓(90 分鐘 ON, 30 分鐘 OFF) $40\pm 2^{\circ}\text{C}$, 90 to 95%RH, 1000h Rated voltage (90 min ON, 30 min OFF)
負荷壽命 Load life	$\pm(5\%+0.05\Omega)$ 以內。 Within $\pm(5\%+0.05\Omega)$	7.10 項參照 Comply with 7.10 $70\pm 3^{\circ}\text{C}$, 1000 小時 定格電壓(90 分鐘 ON, 30 分鐘 OFF) $70\pm 3^{\circ}\text{C}$, 1000h Rated voltage (90 min ON, 30 min OFF)

4. 表示 Indication

(1)定格電力 Rated Power

(2)公稱抵抗值 Resistance

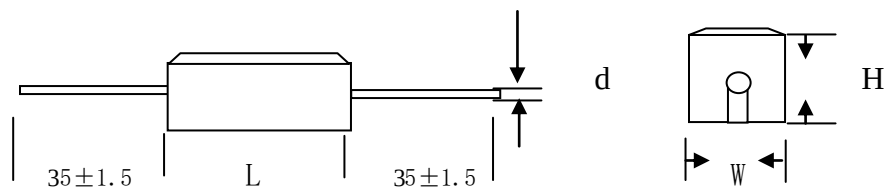
(3)抵抗值許容差 Tolerance

例： Sample

5W 100Ω J

5. 外形寸法 External dimensions

5.1 CR-L 型 CR-Ltype



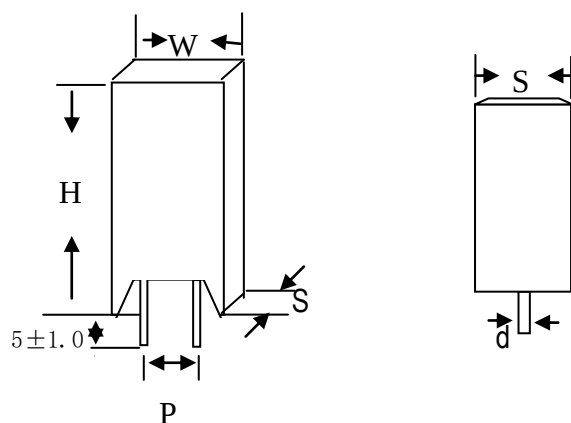
單位:mm

Unit:mm

Watt	L	W	H	$\Phi d \pm 0.05$	阻值範圍(Ω)	
					Resistance Range	
					線繞 Wire Wound	金屬氧化皮膜 Metal Oxide Film
1W	14±1.0	6.5±1.0	6.5±1.0	0.50	0.1Ω~22Ω	25Ω~56KΩ
2W	18±1.0	7.0±1.0	7.0±1.0	0.50	0.1Ω~22Ω	25Ω~56KΩ
3W	22±1.0	8.0±1.0	8.0±1.0	0.70	0.1Ω~47Ω	50Ω~100KΩ
5W	22±1.0	9.5±1.0	9.5±1.0	0.70	0.1Ω~47Ω	50Ω~100KΩ
7W	35±1.5	9.5±1.5	9.5±1.5	0.70	0.5Ω~330Ω	450Ω~100KΩ

10W	48 $\pm$ 1.5	9.5 $\pm$ 1.5	9.5 $\pm$ 1.5	0.70	0.5 Ω ~450 Ω	470 Ω ~100K Ω
15W	48 $\pm$ 1.5	13 $\pm$ 1.5	13 $\pm$ 1.5	0.70	1 Ω ~500 Ω	510 Ω ~100K Ω
20W	63 $\pm$ 1.5	13 $\pm$ 1.5	13 $\pm$ 1.5	0.70	1 Ω ~600 Ω	620 Ω ~100K Ω
30W	75 $\pm$ 2.0	19 $\pm$ 2.0	17 $\pm$ 2.0	0.70	1 Ω ~600 Ω	620 Ω ~100K Ω
40W	89 $\pm$ 2.0	19 $\pm$ 2.0	19 $\pm$ 2.0	0.70	1 Ω ~600 Ω	620 Ω ~100K Ω

5.2 CR-M 型 CR-M type

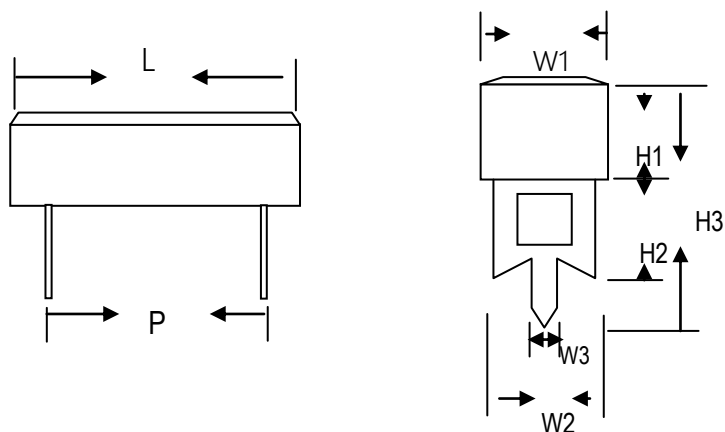


單位：mm

Unit：mm

Watt	$W \pm 1.0$	$S \pm 1.0$	$H \pm 1.5$	$\Phi d \pm 0.05$	$P \pm 1.0$	阻值範圍(Ω)	
						Resistance Range(Ω)	
						線繞 Wire Wound	金屬氧化皮膜 Metal Oxide Film
2W	11.5	7.5	20.5	0.70	4.5	0.1 Ω ~47 Ω	50 Ω ~100K Ω
3W	12	8.5	25	0.70	4.5	0.1 Ω ~47 Ω	50 Ω ~100K Ω
5W	13	9.5	25	0.70	4.5	0.1 Ω ~47 Ω	50 Ω ~100K Ω
7W	13	9.5	38	0.70	4.5	0.5 Ω ~330 Ω	450 Ω ~100K Ω
10W	13	9.5	52	0.70	4.5	0.5 Ω ~450 Ω	470 Ω ~100K Ω
10W	16	11.5	36	0.70	4.5	0.5 Ω ~450 Ω	470 Ω ~100K Ω

5.3 CR-YB 型 CR-YBtype

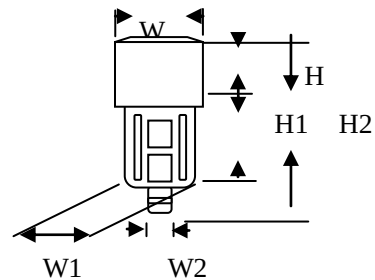
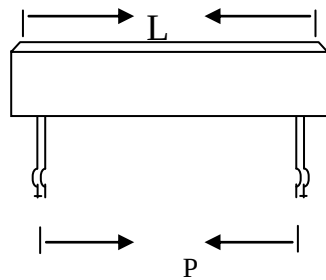


單位:mm

Unit:mm

Watt	Dimensions (mm)								阻值範圍(Ω) Resistance Range
	L	P±1.5	W1±1.2	W2±0.2	W3±0.2	H1±1.2	H2±0.2	H3±1.5	
15	48±1.5	32.5	12.5	10	2.7	12.5	15	36	1.0-820
20	63±2	44	12.5	10	2.7	12.5	15	36	1.0-1K

5.4 CR-YD 型 CR-YD type

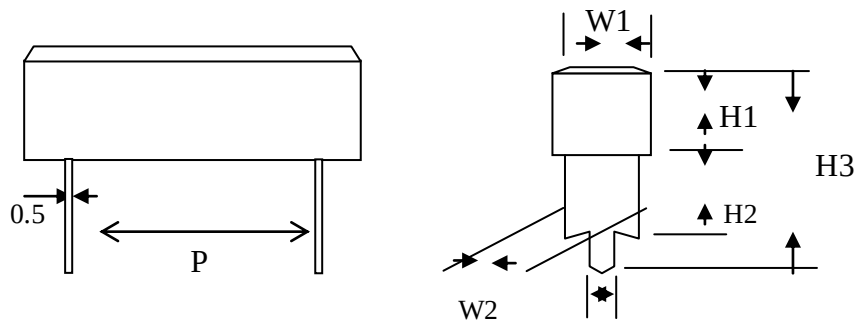


單位:mm

Unit:mm

Watt	Dimensions (mm)								阻值範圍(Ω) Resistance Range
	L	P±1.5	W±1.0	W1±0.2	W2±0.2	H±0.2	H1±0.2	H2±1.5	
3	24±1.0	12	9.5	7.5	1.6	9.5	25	39	0.5-150
5	27±1.0	15	9.5	7.5	1.6	9.5	25	39	0.5-220
7	35±1.5	22.5	9.5	7.5	1.6	9.5	25	39	1-470
10	48±1.5	34	9.5	7.5	1.6	9.5	25	39	1-680
15	48±1.5	32.5	12.5	10	3	12.5	30	47.5	1-820
20	63±2.0	44	12.5	10	3	12.5	30	47.5	1-1K

5.5 CR-YA 型 CR-YA type



W3

單位:mm

Watt	Dimensions (mm)								阻值範圍(Ω) Resistance Range(Ω)
	L	P± 1.5	W1± 1.0	W2± 0.2	W3± 0.2	H1± 0.2	H2± 0.2	H3± 0.2	
3	24± 1.0	12	9.5	5.3	0.9	9.5	10	25.5	0.5-150
5	27± 1.0	15	9.5	5.3	0.9	9.5	10	25.5	0.5-220
7	35± 1.5	22.5	9.5	5.3	0.9	9.5	10	25.5	1-470
10	48± 1.5	34	9.5	5.3	0.9	9.5	10	25.5	1-680

Unit:mm

5.6

CR-YC

型

CR-YC

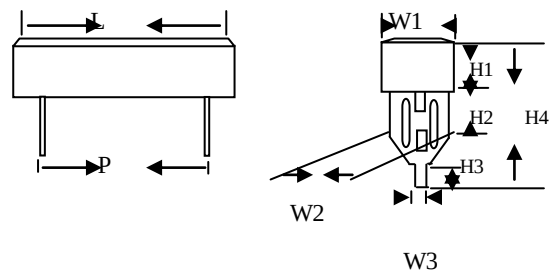
type

Watt	Dimensions (mm)								阻值範圍(Ω) Resistance Range(Ω)
	L	P± 1.5	W1± 1.0	W2± 0.2	W3± 0.2	H1± 1	H2± 1.5	H3± 1.5	
3	24± 1.0	12	9.5	7.3	1.6	9.5	10	25	0.5-150
5	27± 1.0	15	9.5	7.3	1.6	9.5	10	25	0.5-220
7	35± 1.5	22.5	9.5	7.3	1.6	9.5	10	25	1-470
10	48± 1.5	34	9.5	7.3	1.6	9.5	10	25	1-680

單位:mm

Unit:mm

5.7 CR-YE 型 CR-YE type



Watt	Dimensions (mm)									阻值範圍(Ω) Resistance Range(Ω)
	L	P±	W1±	W2±	W3±	H1±	H2±	H3±	H4±	
		1.5	1.0	0.2	0.2	0.2	0.2	1.5	1.5	
3	24± 1.0	12	9.5	7.4	3	9.5	7.5	4.5	30.4	0.5-150
5	27± 1.0	15	9.5	7.4	3	9.5	7.5	4.5	30.4	0.5-220
7	35± 1.5	22.5	9.5	7.4	3	9.5	7.5	4.5	30.4	1-470
10	48± 1.5	34	9.5	7.4	3	9.5	7.5	4.5	30.4	1-680

位:
mm

5.8
CR-
YD1
型

CR-YD1

Watt	Dimensions (mm)									阻值範圍(Ω) Resistance Range(Ω)
	L1	P±1.5	W1±1	W2	W3	W	H1	H2	H3	
15	48±1.5			10	1.5	5	30	30	47.5	10-820
20	63±2.0			10	1.5	5	30	30	47.5	1.0-1K

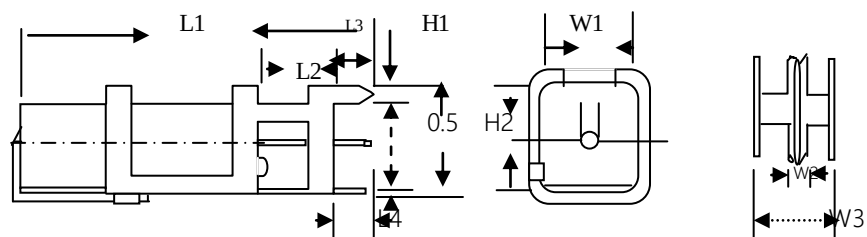
type

H3

單位:mm

Unit:mm

5.9 CR-V 型 CR-V type



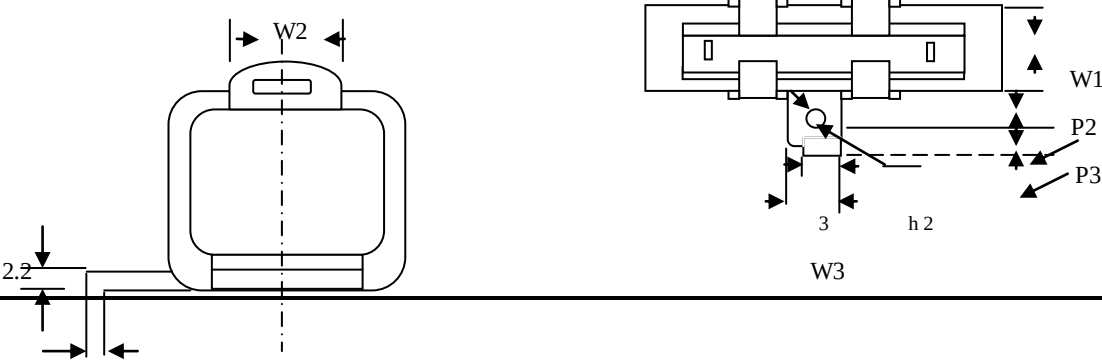
Watt	Dimensions (mm)									阻值範圍(Ω) Resistance Range(Ω)
	L1	L2± 0.2	L3± 0.2	H1± 0.2	H2± 0.2	H3± 1.0	W1± 1.0	W2± 0.2	W3± 0.5	
5	31± 1.0	5	4	1.5	11	9.5	9.5	1.5	11.5	0.5-220
7	49± 1.5	10	4	1.5	11	9.5	9.5	1.5	11.5	1-470
10	62.5± 2	10	4	1.5	11	9.5	9.5	1.5	11.5	1-680
15	63.5± 2	10	4.5	2.5	14.5	13	13	2.5	15.5	1-820
20	75±2	10	4.5	2.5	17.5	13	13	2.5	15.5	1-1K

單位:mm

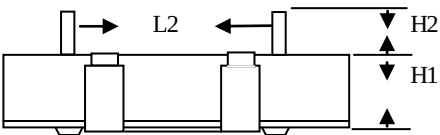
Unit:mm

Unit:mm

5.10 CR-H 型 CR-H type



t 2



單位:mm

Watt	Dimensions (mm)											阻值範圍(Ω) Resistance Range(Ω)
	L1	L2± 1.0	W3± 0.2	P2	P3	t2	h2	W1	W2	H1	H2	
10	48± 1.5	23	12	6	8	0.6	4	9.5±1.0	5	9.5±1.0	6±1.5	1-680
15	48± 1.5	23	12	7	8	0.8	4	12.5± 1.2	6	12.5± 1.2	7.5± 2.0	10-820
20	63± 2.0	23	12	7	10	0.8	4	12.5± 1.2	6	12.5± 1.2	7.5± 2.0	1-1K
30	75± 2.5	56	18	9	10	0.8	4.2	19±1.5	7.5	19±1.5	10±2.0	1-1K
40	88± 2.5	68	18	9	10	0.8	4.2	19±1.5	7.5	19±1.5	10±2.0	1-1K

Unit:mm