

# HIGH VOLTAGE CHIP RESISTORS HVR SERIES

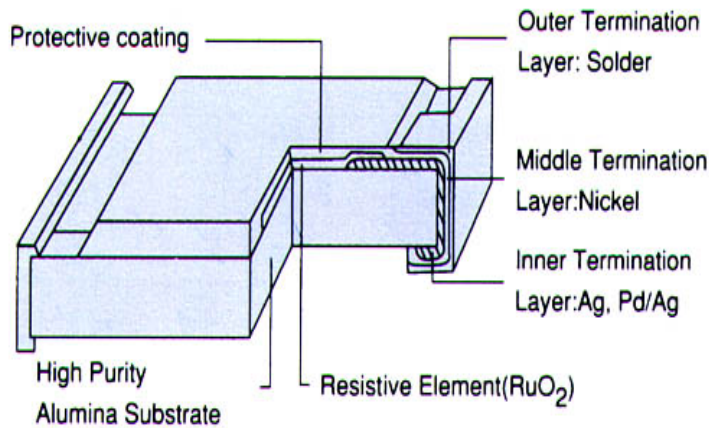
## ■ Features

- Small size and lightweight with size range per int'l standard
- Highly stable in auto-placement surface mounting application
- Special material and design for high working voltage require.

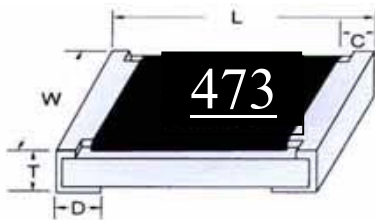
## ■ Applications

- Back light inverter
- Measurement instrument
- Medical or Military equipment
- Power supply
- Automotive industry
- Laser printer

## ■ Configuration



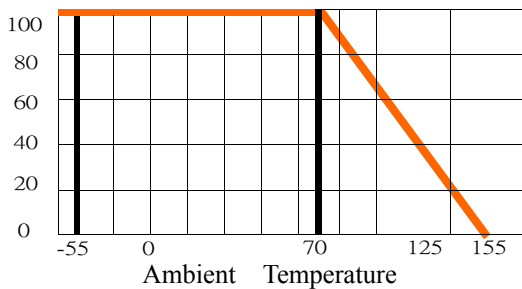
## ■ Dimensions



Size	L	W	C	D	T
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.15
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.15
1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.60±0.15
2010	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.55±0.10
2512	6.40±0.20	3.20±0.20	0.60±0.25	0.60±0.25	0.60±0.10

Unit(mm)

## ■ Power Derating Curve



Maximum dissipation in percentage of rated power as a function of the ambient temperature for 0603,0805,1206,2010,2512

# HIGH VOLTAGE CHIP RESISTORS HVR SERIES

## ■ Rating

Type	Size	Power Rating at 70°C	Max. Working Voltage	Max. Overload Voltage	Resistance Tolerance	Temperature Coefficient (TCR; ppm/°C)	Resistance Range		Standard Resistance Values
							Min.	Max.	
HVR0603	0603	1/10W	200V	400V	±1%(F) ±5%(J)	±1%: ±100 ±5%: ±200	±1%: 100K~10MΩ		±1%: E24/E-96 ±5%:E-24
HVR0805	0805	1/8W	400V	800V			±5%: 100K~22MΩ		
HVR1206	1206	1/4W	800V	1600V			±1%: 100K~10MΩ		
HVR2010	2010	1/2W	2000V	3000V			±5%: 100K~100MΩ		
HVR2512	2512	1W	3000V	4000V					

Note : (1) RCWV =  $(PxR)^{1/2}$  or Max. RCWV listed above, whichever is lower  
 RCWV: Working Voltage(V). P: Rated Power (W), R: Resistance Value(Ω)

## ■ Part Number

HVR	0805	J	R	-	100KR
Type	Size	Tolerance	Packing		Resistance
	0603	F: ± 1%	R : Paper tape- 5Kpcs		100KR=100KΩ
	0805	J : ± 5%	K : Plastic tape- 4Kpcs		10MR=10MΩ
	1206				
	2010				
	2512				

## ■ Resistance Marking

### E-24 series



3 digits marking for ±1% and ±5% E-24

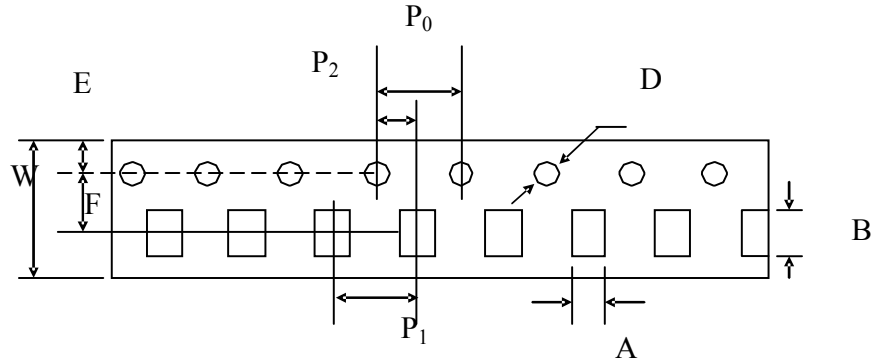
examples: **106**  $10 \times 10^6 = 10M\Omega$

# HIGH VOLTAGE CHIP RESISTORS HVR SERIES

## GENERAL SPECIFICATION

### ■ Tape And Reel Package

• Taping specs are according to EIA RS-481

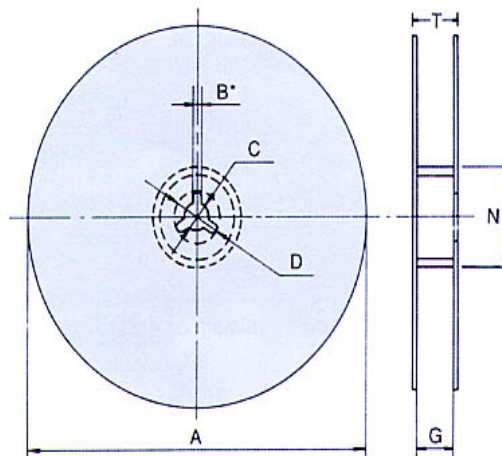


Accumulated dimensional tolerance  $40\pm 0.2\text{mm}$

Size	A	B	W	F	E	P1	P2	P0	D
0603	$1.10\pm 0.20$	$1.90\pm 0.20$	$8.00\pm 0.30$	$3.50\pm 0.05$	$1.75\pm 0.10$	$4.00\pm 0.10$	$2.00\pm 0.05$	$4.00\pm 0.10$	$1.50+0.10/-0$
0805	$1.65\pm 0.20$	$2.40\pm 0.20$	$8.00\pm 0.30$	$3.50\pm 0.05$	$1.75\pm 0.10$	$4.00\pm 0.10$	$2.00\pm 0.05$	$4.00\pm 0.10$	$1.50+0.10/-0$
1206	$2.00\pm 0.20$	$3.60\pm 0.20$	$8.00\pm 0.30$	$3.50\pm 0.05$	$1.75\pm 0.10$	$4.00\pm 0.10$	$2.00\pm 0.05$	$4.00\pm 0.10$	$1.50+0.10/-0$
2010	$2.80\pm 0.20$	$5.50\pm 0.20$	$12.00\pm 0.30$	$5.50\pm 0.05$	$1.75\pm 0.10$	$4.00\pm 0.10$	$2.00\pm 0.05$	$4.00\pm 0.10$	$1.50+0.10/-0$
2512	$3.50\pm 0.20$	$6.70\pm 0.20$	$12.00\pm 0.30$	$5.50\pm 0.05$	$1.75\pm 0.10$	$4.00\pm 0.10$	$2.00\pm 0.05$	$4.00\pm 0.10$	$1.50+0.10/-0$

(unit: mm)

### ■ Reel Package



Size	Packaging Q'ty	A	N	C	D	B	G	T
0603	5Kpcs / Reel	$178.0\pm 2.0$	$60.0\pm 0.5$	$13.0\pm 0.5$	20min	$2.0\pm 0.5$	$10.0\pm 1.5$	14.9 max.
0805	10Kpcs / Reel	$254.0\pm 2.0$	$100.0\pm 1.0$	$13.5\pm 0.5$	20min	$2.0\pm 0.5$	$10.0\pm 1.5$	14.9 max.
1206	20Kpcs / Reel	$330.0\pm 2.0$	$100.0\pm 1.0$	$13.5\pm 0.5$	20min	$2.0\pm 0.5$	$10.0\pm 1.5$	14.9 max.
2010	4Kpcs / Reel	$178.0\pm 2.0$	$60.0\pm 0.5$	$13.0\pm 0.5$	20min	$2.0\pm 0.5$	$13.8\pm 1.5$	16.7 max.
2512	8Kpcs / Reel	$254.0\pm 2.0$	$100.0\pm 1.0$	$13.5\pm 0.5$	20min	$2.0\pm 0.5$	$13.8\pm 1.5$	20.0 max.
	16Kpcs / Reel	$330.0\pm 2.0$	$100.0\pm 1.0$	$13.5\pm 0.5$	20min	$2.0\pm 0.5$	$13.8\pm 1.5$	20.0 max.

(unit: mm)

# HIGH VOLTAGE CHIP RESISTORS HVR SERIES

## ■ Specification And Test Methods

ITEM	SPECIFICATION	TEST METHOD
DC Resistance	J: $\pm 5\%$	<b>JIS C 5202 5.1 / IEC 115-1 4.5</b> Measure the resistance value.
Short time Overload	J: $\Delta R \leq \pm(1\% + 0.1\Omega)$ No mechanical damage	<b>IEC 115-1 4.13 / JIS C 5202 5.5</b> 2×Rated voltage or Max. Overload Voltage for 5 sec. measure resistance after 30 minutes
Solderability	Over 95% of termination must be covered with (Sn+Ag+Cu)	<b>JIS C 5202 6.5/ IEC 115-1 4.17</b> After immersing flux, dip in the $245\pm 5^\circ\text{C}$ molten solder bath for $2\pm 0.5$ sec.
Resistance to Solder Heat	J: $\Delta R \leq \pm(1\% + 0.1\Omega)$ No mechanical damage	<b>JIS C 5202 6.4 / IEC 115-1 4.18</b> With $260\pm 5^\circ\text{C}$ for $10\pm 1$ sec.
Temperature Coefficient of Resistance (TCR)	$\pm 1\%: \pm 100\text{ppm}/^\circ\text{C}$ $\pm 5\%: \pm 200\text{ppm}/^\circ\text{C}$	<b>JIS C 5202 5.2 / IEC 115-1 4.8.4.2</b> T1 T2 Test temperature: $25^\circ\text{C} \rightarrow -55^\circ\text{C}$ $25^\circ\text{C} \rightarrow 125^\circ\text{C}$ $\text{TCR}(\text{ppm}/^\circ\text{C}) = \frac{R_2 - R_1}{R_1} \times \frac{1}{T_2 - T_1} \times 10^6$ T1: $25^\circ\text{C}$ T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2)
Voltage Coefficient of Resistance (VCR)	$\leq \pm 200\text{ppm}/\text{V}$	<b>JIS C 5202 5.3</b> Measuring Voltage 10V/100V
Load Life Humidity	J: $\Delta R \leq \pm(5\% + 0.1\Omega)$	<b>JIS C 5202 7.9/ IEC 115-1 4.24.2</b> Maintain the temperature of the resistor at $40\pm 2^\circ\text{C}$ and 90~95% RH with the rated voltage applied. Cycle ON for 1.5 hours and OFF for 0.5 hour for 1000+48/-0 hours. After 1~4 hour, measure the resistance value.
Load Life	J: $\Delta R \leq \pm(5\% + 0.1\Omega)$	<b>JIS C 5202 7.10/ IEC 115-1 4.25.1</b> Permanent resistance change after 1000+48/-0 hours (1.5 hours ON, 0.5 hour OFF) at RCWV or Max. Keep the resistor at $70\pm 2^\circ\text{C}$ ambient
Temperature Cycle	J: $\Delta R \leq \pm(1\% + 0.05\Omega)$ No mechanical damage	<b>JIS C 5202 7.4 / IEC 115-1 4.19</b> Repeat 5 cycles as follows $-55^\circ\text{C}$ (30 min.)+ $25^\circ\text{C}$ (2~3 min.) $+155^\circ\text{C}$ (30 min.)+ $25^\circ\text{C}$ (2~3 min.)
Insulation Resistance	Between termination and coating must be over 1000M $\Omega$	<b>JIS C 5202 5.6 / IEC 115-1 4.6.1.1</b> Test voltage: 100±15V
Bending Strength	J: $\Delta R \leq \pm(1\% + 0.05\Omega)$ No mechanical damage	<b>IEC 115-1 4.33</b> Resistance change after bended on the 90mm PCB. Bend: 2mm for 1206 ,2010,2512