ROYALOHM

C O N F I D E N T I A L D O C U M E N T

SPECIFICATION FOR APPROVAL

OZDISAN ELEKTRONIK A.S.

Description : Chip Kit Resistors

Royalohm Part no.:

HP122WxE012KIT (HP12 2W +/-1%, +/-5% KIT Series)

Approved by

Parts corresponding to RoHS Compliant: 2005-Apr.-1

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Approved	Checked	Prepared
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Issue Date: 2016/06/29

CHANGE NOTIFICATION HISTORY			
Version	**Date of Version**	**History**	**Remark**
1	2016/06/29	High Power (2512) KIT Series	
		Resistance tolerance: ±1% & ±5%)	

	Part No.: HP122WxE012KIT

1. Scope:

This specification for approval relates to Chip Kit Resistors manufactured by ROYALOHM 's specifications.

2. Type designation:

The type designation shall be in the following form:

	Type	Power Rating	Resistance tolerance	Nominal Resistance
Ex.	HP12	2W	F,J	10Ω

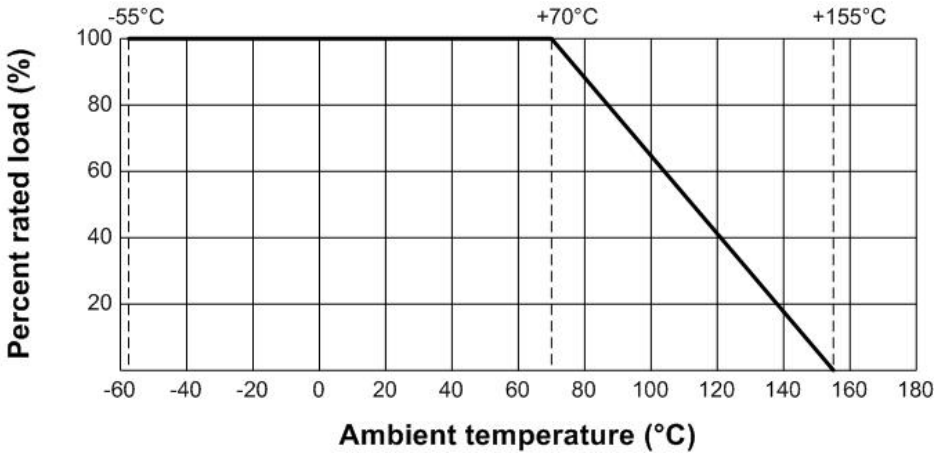
3. Ratings:

Type	HP12
Power Rating at 70 ℃	2W
Max. Working Voltage	250 V
Max. Overload Voltage	500 V
Diclectric Withstanding Voltage	500 V
Temperature Range	-55℃～+155℃
Ambient Temperature	70 ℃

3.1 Power rating:

Resistors shall have a power rating based on continuous load operation at an ambient temperature of 70 ℃ . For temperature in excess of 70 ℃ , The load shall be derate as shown in figure 1.

Figure 1

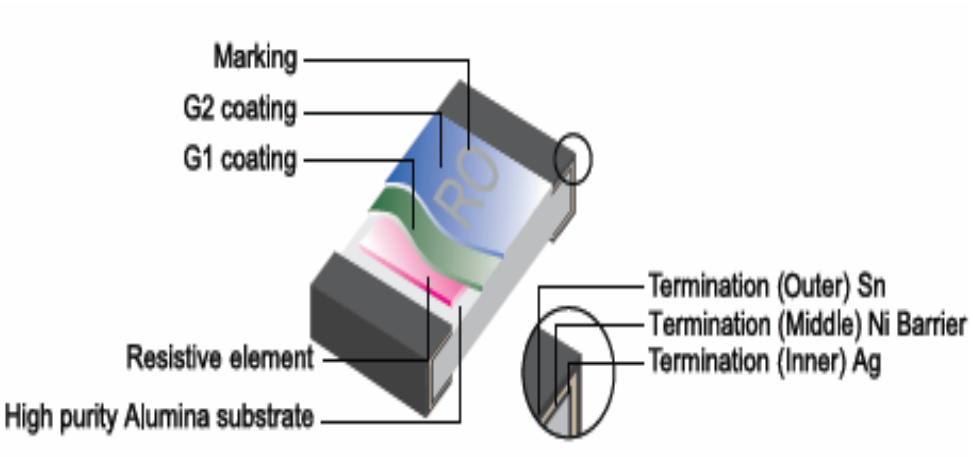


3.2 Nominal Resistance

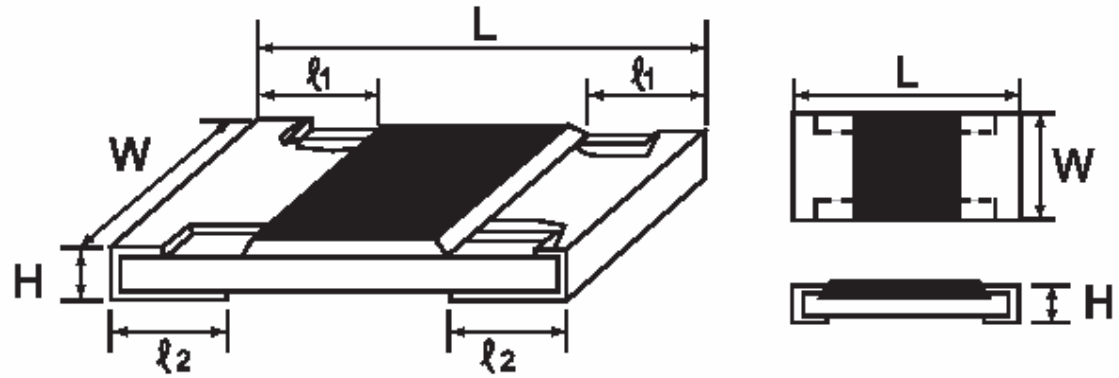
Effective figures of nominal resistance shall be in accordance with E-24 and E-96 series E-96 series for 1 %

Chip Kit Resistors

4. Construction :



5. Power rating and dimensions



Dimension :

Type	Dimension (mm)				
	L ± 0.10	W ± 0.15	H ± 0.10	ℓ1 ± 0.25	ℓ2 ± 0.20
HP12 (2512)	6.35	3.20	0.55	0.60	0.50

Power Rating :

Type	Power Rating at 70 ℃	Tolerance %	Resistance Range	Standard Series
HP12 (2512)	2W	± 1	10Ω ~ 1MΩ	E-96
		± 5	10Ω ~ 1MΩ	E-24

Chip Kit Resistors

6. Marking :

6.1 Resistors

A. Marking for E-96 series in 2512 size : 4 Digits

*The first 3 digits are singnificant figures of resistance and the 4th digit denoted number of zeros.

Ex.		1003		100KΩ

*For ohmic values below 100 Ω, letter"R" is for decimal point.

Ex.		1R80		1.8Ω

B. Marking for E-24 series in 2512 size : 3 Digits

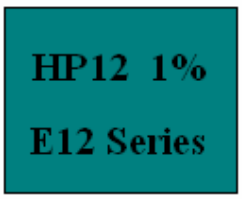
*The first 2 digits are singnificant figures of resistance and the 3rd digit denoted number of zeros.

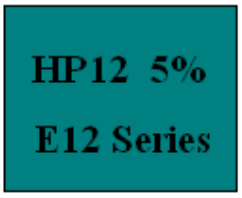
Ex.		102		1KΩ

*For ohmic values below 10 Ω, letter"R" is for decimal point.

Ex.		R68		0.68Ω

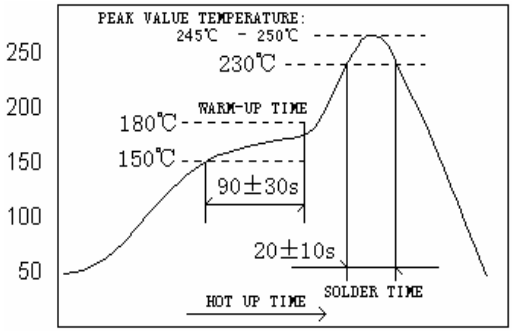
6.2 Labels





Chip Kit Resistors

7. Performance specification :

Characteristics	Limits	Test Methods (JIS C 5201-1)
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	4.7 Clamped in the trough of a 90℃ metallic v-block and shall be tested at ac potential respectively specified in the type for 60-70 seconds
Temperature Coefficient	1Ω~10Ω ≤± 200PPM/℃ 10.1Ω~10MΩ ≤± 100PPM/℃	4.8 Natural resistance change per temp. degree centigrade. $\frac{R2-R1}{R1(t2-t1)} \times 10^6$ (PPM/℃) R1: Resistance value at room temperature (T1) R2: Resistance value at room temp. plus 100 ℃(T2) Test pattern: room temp. (T1), room temp. +100℃(T2)
Short time overload	Resistance change rate is ± 5% (2.0% + 0.1Ω) Max. ± 1% (1.0% + 0.1Ω) Max.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds
Solderability	95 % coverage Min.	Wave Solder: Test temperature of solder: 245°C ±3°C dipping time in solder : 2-3 seconds.
		Refolw: 
Soldering heat	Resistance change rate is: ± (1.0%+0.05Ω) Max.	4.18 Dip the resistor into a solder bath having a temperature of 260°C±3°C and hold it for 10±1 seconds.
Temperature cycling	Resistance change rate is ± 5% (1.0% + 0.05Ω) Max. ± 1% (0.5% + 0.05Ω) Max.	4.19 Resistance change after continuous 5 cycles for duty cycle specified below :

Step	Temperature	Time
1	-55℃ ± 3℃	30 mins
2	Room temp.	10～15 mins
3	+155℃ ± 2℃	30 mins
4	Room temp.	10～15 mins

Chip Kit Resistors

7. Performance specification :

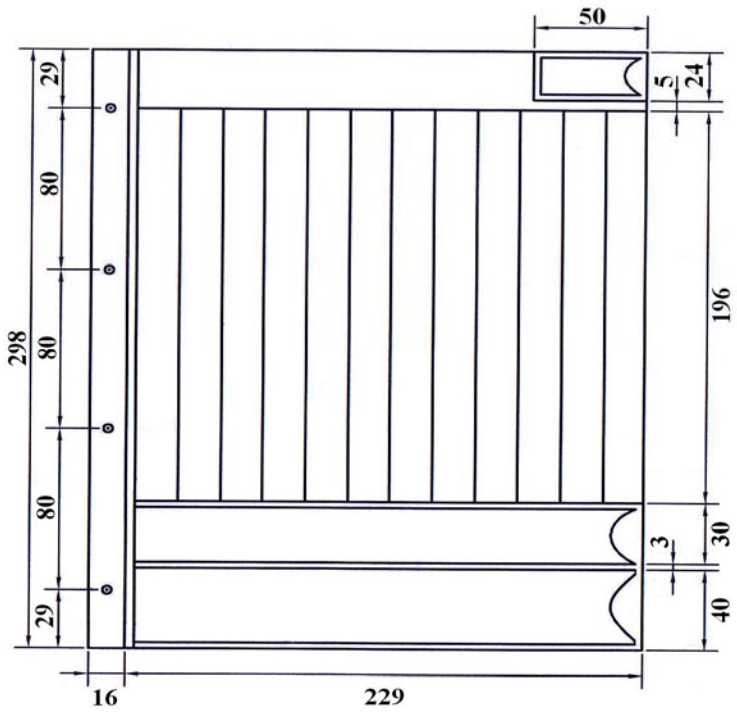
Characteristics	Limits	Test Methods (JIS C 5201-1)
Humidity	Resistance change rate is ± 5% (3.0% + 0.1Ω) Max. ± 1% (0.5% + 0.1Ω) Max.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2°C and 90-95% relative humidity
Load life in humidity	Resistance change rate is ± 5% (3.0% + 0.1Ω) Max. ± 1% (1.0% + 0.1Ω) Max.	7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40℃ ± 2℃ and 90 to 95 % relative humidity
Load Life	Resistance change rate is ± 5% (3.0% + 0.1Ω) Max. ± 1% (1.0% + 0.1Ω) Max.	4.25.1 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of (1.5 hours"on", 0.5 hour"off") at 70℃ ± 2℃ ambient
Terminal bending	Resistance change rate is ± (1.0% + 0.05Ω) Max.	4.33 Twist of Test Board : Y/X = 3/90 mm for 60 seconds

Chip Kit Resistors

8. Kit resistors :

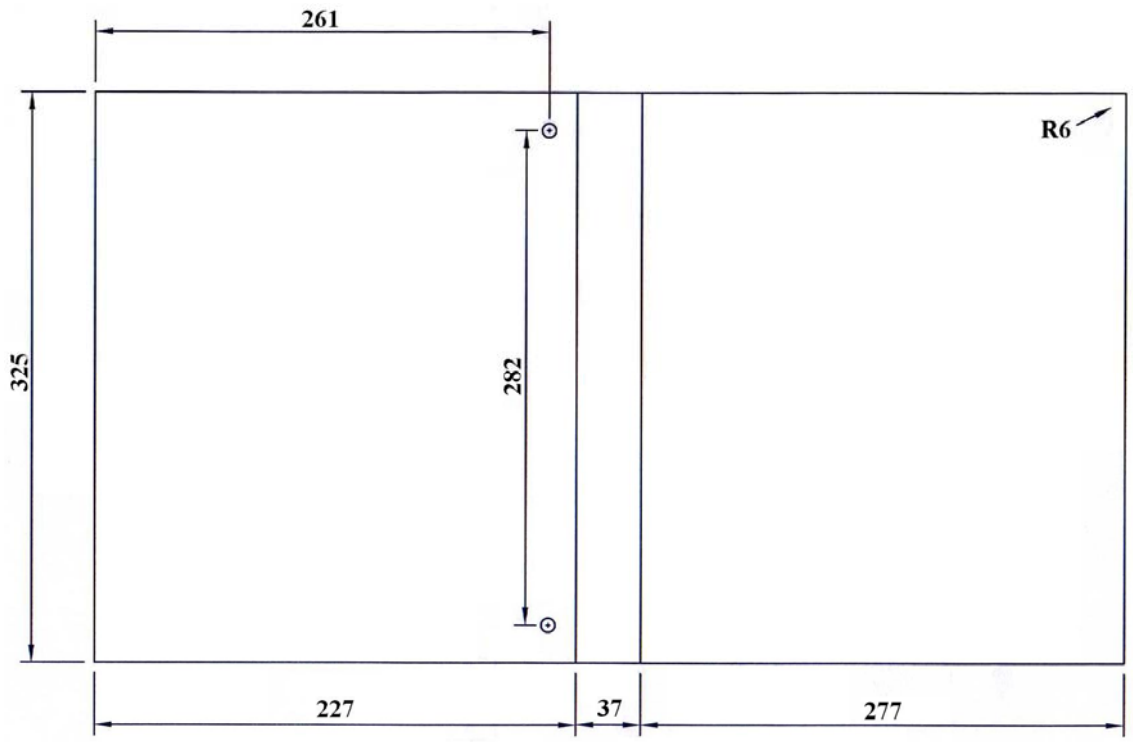
8.1 Insert for Chip Kit

Dimension (mm)



8.2 Album for Chip Kit

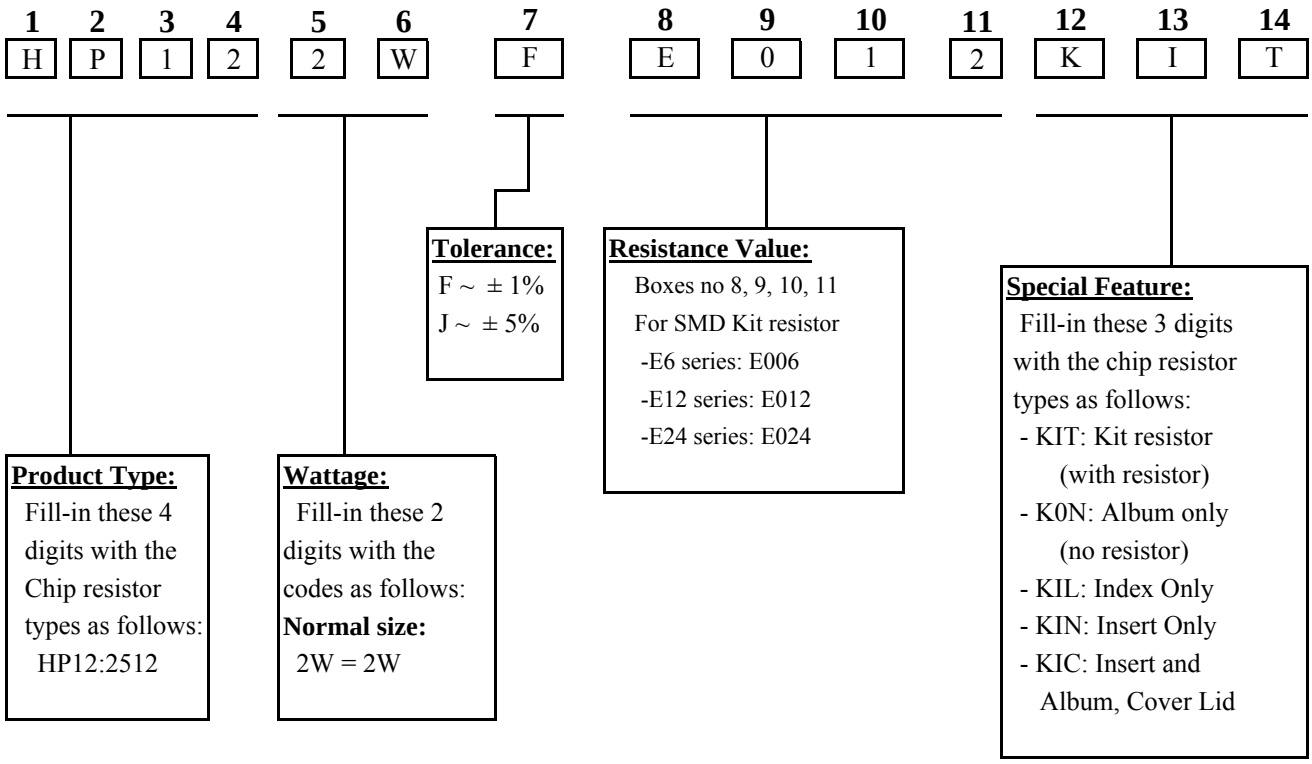
Dimension (mm)



Part Number System

Explanation of Part Number System

(Chip Kit Resistors)



Sample : HP12 2W (2512) +/-1% KIT E12 Series → HP122WFE012KIT
HP12 2W (2512) +/-5% KIT E12 Series → HP122WJE012KIT

Chip Kit Resistors

Environment Related Substance

This product complies to EU RoHS directive, EU PAHs directive, EU PFOS directive and Halogen free.

Ozone layer depleting substances.

Ozone depleting substances are not used in our manufacturing process of this product.
This product is not manufactured using Chloro fluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrobromofluorocarbons (HBFCs) or other ozone depleting substances in any phase of the manufacturing process.

Storage Condition

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 25°C ± 5°C and a relative humidity of 60%RH ± 10%RH

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl_2, H_2S, NH_3, SO_2, or NO_2
2. In direct sunlight

Chip Kit Resistors

PRODUCT: RMC Kit (2512) +/-5%
E12 Series = 61 values (10R to 1M)
(With resistor 2 strip per value)
Total Qty: 6,100pcs.

NO.	Value
1	10E
2	12E
3	15E
4	18E
5	22E
6	27E
7	33E
8	39E
9	47E
10	56E
11	68E
12	82E
13	100E
14	120E
15	150E
16	180E
17	220E
18	270E
19	330E
20	390E

NO.	Value
21	470E
22	560E
23	680E
24	820E
25	1K
26	1K2
27	1K5
28	1K8
29	2K2
30	2K7
31	3K3
32	3K9
33	4K7
34	5K6
35	6K8
36	8K2
37	10K
38	12K
39	15K
40	18K

NO.	Value
41	22K
42	27K
43	33K
44	39K
45	47K
46	56K
47	68K
48	82K
49	100K
50	120K
51	150K
52	180K
53	220K
54	270K
55	330K
56	390K
57	470K
58	560K
59	680K
60	820K

NO.	Value
61	1M

Chip Kit Resistors

PRODUCT: RMC Kit (2512) +/-1%
E12 Series = 61 values (10R to 1M)
(With resistor 2 strip per value)
Total Qty: 6,100pcs.

NO.	Value
1	10E
2	12E
3	15E
4	18E
5	22E
6	27E
7	33E
8	39E
9	47E
10	56E
11	68E
12	82E
13	100E
14	120E
15	150E
16	180E
17	220E
18	270E
19	330E
20	390E

NO.	Value
21	470E
22	560E
23	680E
24	820E
25	1K
26	1K2
27	1K5
28	1K8
29	2K2
30	2K7
31	3K3
32	3K9
33	4K7
34	5K6
35	6K8
36	8K2
37	10K
38	12K
39	15K
40	18K

NO.	Value
41	22K
42	27K
43	33K
44	39K
45	47K
46	56K
47	68K
48	82K
49	100K
50	120K
51	150K
52	180K
53	220K
54	270K
55	330K
56	390K
57	470K
58	560K
59	680K
60	820K

NO.	Value
61	1M