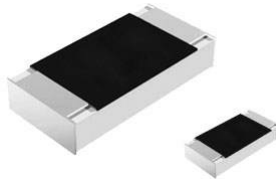


# High Voltage (up to 0.5 kV) Thick Film Chip Resistors



## FEATURES

- High operating voltage (up to 500 V)
- Pure tin solder contacts on Ni barrier layer provides compatibility with lead (Pb)-free and lead containing soldering processes
- Metal glaze on high quality ceramic
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

STANDARD ELECTRICAL SPECIFICATIONS								
MODEL	CASE SIZE INCH	CASE SIZE METRIC	POWER RATING $P_{70}$ W	LIMITING ELEMENT VOLTAGE $U_{MAX. AC_{RMS}/DC}$ V	TEMPERATURE COEFFICIENT $\pm$ ppm/K	TOLERANCE $\pm$ %	RESISTANCE RANGE $\Omega$	SERIES
RCV0805 e3	0805	RR 2012M	0.125	400	100	1	100K to 10M	E24; E96
					200	5		E24
RCV1206 e3	1206	RR 3216M	0.25	500	100	1	100K to 10M	E24; E96
					200	5		E24

### Notes

- These resistors do not feature a lifetime limitation when operated within the limits of rated dissipation, permissible operating voltage and permissible film temperature. However, the resistance typically increases due to the resistor's film temperature over operating time, generally known as drift. The drift may exceed the stability requirements of an individual application circuit and thereby limits the functional lifetime
- No marking
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material

TECHNICAL SPECIFICATIONS			
PARAMETER	UNIT	RCV0805	RCV1206
Rated dissipation $P_{70}$ <sup>(1)</sup>	W	0.125	0.25
Limiting element voltage $U_{max. AC_{RMS}/DC}$	V	400	500
Insulation voltage $U_{ins.}$ (1 min)	V	> 500	
Voltage coefficient of resistance chart	ppm/V	25	
Insulation resistance	$\Omega$	> $10^9$	
Operating temperature range	$^{\circ}$ C	-55 to +155	
Weight	mg	5.5	10

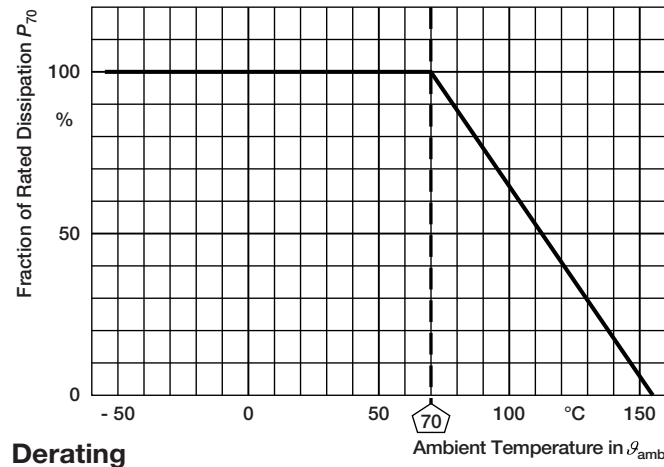
### Note

- <sup>(1)</sup> The power dissipation on the resistors generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155  $^{\circ}$ C is not exceeded

PART NUMBER AND PRODUCT DESCRIPTION					
Part Number: RCV1206100KFKEA					
R	C	V	1	2	0
			6	1	0
			0	K	F
				K	E
					A
MODEL	RESISTANCE	TOLERANCE	TCR	PACKAGING	
RCV0805 RCV1206	K = thousand M = million	F = $\pm$ 1 % J = $\pm$ 5 %	K = $\pm$ 100 ppm/K N = $\pm$ 200 ppm/K	EA, EB, EC	
Product Description: RCV1206 100 100K 1 % ET1 e3					
RCV1206	100	100K	1 %	ET1	e3
MODEL	TCR	RESISTANCE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE
RCV0805 RCV1206	$\pm$ 100 ppm/K $\pm$ 200 ppm/K	100K = 100 k $\Omega$ 10M = 10 M $\Omega$	$\pm$ 1 % $\pm$ 5 %	ET1, ET5, ET6	e3 = pure tin termination finish

PACKAGING						
MODEL	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
RCV0805	EA = ET1	5000	Paper tape acc. to IEC 60068-3 Type I	8 mm	4 mm	180 mm/7"
	EB = ET5	10 000				285 mm/11.25"
	EC = ET6	20 000				330 mm/13"
RCV1206	EA = ET1	5000				180 mm/7"
	EB = ET5	10 000				285 mm/11.25"
	EC = ET6	20 000				330 mm/13"

DIMENSIONS												
SIZE		DIMENSIONS in millimeters					SOLDER PAD DIMENSIONS in millimeters					
INCH	METRIC	L	W	H	T1	T2	REFLOW SOLDERING			WAVE SOLDERING		
							a	b	l	a	b	l
0805	2012	2.0 <sup>+0.20</sup> <sub>-0.10</sub>	1.25 ± 0.15	0.45 ± 0.05	0.3 <sup>+0.20</sup> <sub>-0.10</sub>	0.3 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	3.2 <sup>+0.10</sup> <sub>-0.20</sub>	1.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	1.7	2.0	1.1	1.7	2.3

**FUNCTIONAL PERFORMANCE**




TEST PROCEDURES AND REQUIREMENTS						
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE		REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )	
			Stability for product types: <b>RCV e3</b>		100 k $\Omega$ to 10 M $\Omega$	
4.5	-	Resistance	-		$\pm 1 \%$	$\pm 5 \%$
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max.}$		$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
			Style	Duration		
			RR2012M	1 s		
			RR3216M	2 s		
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40 non-activated flux; (235 $\pm$ 5) $^{\circ}$ C (2 $\pm$ 0.2) s		Good tinning ( $\geq 95 \%$ covered); no visible damage	
			Solder bath method; Sn96.5Ag3Cu0.5 non-activated flux; (245 $\pm$ 5) $^{\circ}$ C (3 $\pm$ 0.3) s		Good tinning ( $\geq 95 \%$ covered); no visible damage	
4.8.4.2	-	Temperature coefficient	(20 / -55 / 20) $^{\circ}$ C and (20 / 155 / 20) $^{\circ}$ C		$\pm 100$ ppm/K	$\pm 200$ ppm/K
4.32	21 (Uu <sub>3</sub> )	Shear (adhesion)	17.7 N		No visible damage	
4.33	21 (Uu <sub>1</sub> )	Substrate bending	Depth 2 mm; 3 times		No visible damage, no open circuit in bent position $\pm (0.25 \% R + 0.05 \Omega)$	
4.19	14 (Na)	Rapid change of temperature	30 min. at -55 $^{\circ}$ C; 30 min. at 125 $^{\circ}$ C		$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
			5 cycles			
			1000 cycles			
4.23	-	Climatic sequence:	-		$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
4.23.2	2 (Ba)	Dry heat	125 $^{\circ}$ C; 16 h			
4.23.3	30 (Db)	Damp heat, cyclic	55 $^{\circ}$ C; $\geq 90 \%$ RH 24 h; 1 cycle			
4.23.4	1 (Aa)	Cold	-55 $^{\circ}$ C; 2 h			
4.23.5	13 (M)	Low air pressure	1 kPa; (25 $\pm$ 10) $^{\circ}$ C; 1 h			
4.23.6	30 (Db)	Damp heat, cyclic	55 $^{\circ}$ C; . 90 % RH 24 h; 5 cycle			
4.23.7	-	DC load	$U = \sqrt{P_{70} \times R}$			
4.25.1	-	Endurance at 70 $^{\circ}$ C	$U = \sqrt{P_{70} \times R} \leq U_{max.}$ 1.5 h on; 0.5 h off;		$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.1 \Omega)$
			70 $^{\circ}$ C; 1000 h			
			70 $^{\circ}$ C; 8000 h			
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 $\pm$ 5) $^{\circ}$ C; (10 $\pm$ 1) s		$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
4.24	78 (Cab)	Damp heat, steady state	(40 $\pm$ 2) $^{\circ}$ C; (93 $\pm$ 3) % RH; 56 days		$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.05 \Omega)$



TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )	
			Stability for product types:	100 k $\Omega$ to 10 M $\Omega$	
			<b>RCV e3</b>		
4.25.3	-	Endurance at upper category temperature	155 °C; 1000 h	$\pm (1 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.05 \Omega)$
4.40	-	Electrostatic discharge (human body model)	IEC 61340-3-1; 3 pos. + 3 neg. discharges; ESD voltage acc. to style	$\pm (1 \% R + 0.05 \Omega)$	
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 °C; method 2	No visible damage	
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 °C; method 1, toothbrush	Marking legible, no visible damage	
4.22	6 (Fc)	Vibration, endurance by sweeping	f = 10 Hz to 2000 Hz; x, y, z $\leq$ 1.5 mm; A $\leq$ 200 m/s <sup>2</sup> ; 10 sweeps per axis	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
4.37	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R}$ $\leq 2 \times U_{max.}$ ; 0.1 s on; 2.5 s off; 1000 cycles	$\pm (1 \% R + 0.05 \Omega)$	
4.27	-	Single pulse high voltage overload, 10 $\mu$ s/700 $\mu$ s	$\hat{U} = 10 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max.}$ ; 10 pulses	$\pm (1 \% R + 0.05 \Omega)$	

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- IEC 60068-2-x, environmental test procedures



## **Disclaimer**

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.