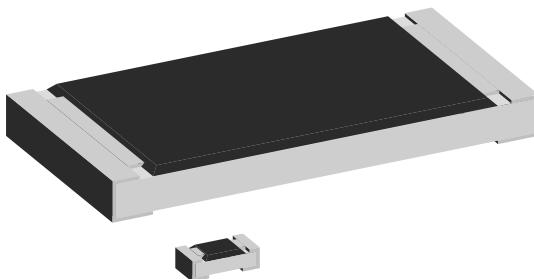


## Standard Thick Film Chip Resistors



### FEATURES

- Stability at different environmental conditions  $\Delta R/R \leq 1\%$  (1000 h rated power at 70 °C)
- 2 mm pitch packaging option for 0603 size
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

### APPLICATIONS

- Automotive
- Industrial
- Telecommunication

### LINKS TO ADDITIONAL RESOURCES



3D Models

D/CRCW e3 standard thick film chip resistors are the perfect choice for most fields of modern electronics where high reliability and stability are of major concern. Typical applications include automotive, telecommunications, and industrial.

TECHNICAL SPECIFICATIONS										
DESCRIPTION	D10/ CRCW0402 e3	D11/ CRCW0603 e3	D12/ CRCW0805 e3	D25/ CRCW1206 e3	CRCW1210 e3	CRCW1218 e3	CRCW2010 e3	CRCW2512 e3		
Imperial size	0402	0603	0805	1206	1210	1218	2010	2512		
Metric size code	RR1005M	RR1608M	RR2012M	RR3216M	RR3225M	RR3246M	RR5025M	RR6332M		
Resistance range	1 Ω to 10 MΩ; jumper (0 Ω)					1 Ω to 2.2 MΩ; jumper (0 Ω)	1 Ω to 10 MΩ; jumper (0 Ω)			
Resistance tolerance	± 5 %; ± 1 %									
Temperature coefficient	± 200 ppm/K; ± 100 ppm/K									
Rated dissipation, $P_{70}$ <sup>(1)(2)</sup>	0.10 W	0.125 W	0.25 W	0.25 W	0.5 W	1.0 W	0.75 W	1.0 W		
Operating voltage, $U_{max. AC_{RMS}/DC}$ <sup>(2)</sup>	75 V	75 V	150 V	200 V	200 V	200 V	400 V	500 V		
Permissible film temperature, $\vartheta_{F max.}$ <sup>(1)</sup>	155 °C									
Operating temperature range	-55 °C to +155 °C									
Permissible voltage against ambient (insulation):										
1 min, $U_{ins}$	100 V	100 V	200 V	300 V	300 V	300 V	300 V	300 V		
Failure rate: FIT <sub>observed</sub>	$\leq 0.1 \times 10^{-9}/h$									

### Notes

(1) Please refer to "Application Information" below

(2) Please refer to "Maximum Resistance Change at Rated Dissipation and Operating Voltage" table, see below

### APPLICATION INFORMATION

When the resistor dissipates power, a temperature rise above the ambient temperature occurs, dependent on the thermal resistance of the assembled resistor together with the printed circuit board. The rated dissipation applies only if the permitted film temperature is not exceeded.

These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime.

<b>MAXIMUM RESISTANCE CHANGE AT RATED DISSIPATION AND OPERATING VOLTAGE</b>			
<b>OPERATION MODE</b>		<b>STANDARD</b>	<b>EXTENDED</b>
Rated dissipation, $P_{70}$	<b>D10/CRCW0402 e3</b>	0.063 W	0.10 W
	<b>D11/CRCW0603 e3</b>	0.10 W	0.125 W
	<b>D12/CRCW0805 e3</b>	0.125 W	0.25 W
Operating voltage, $U_{\max.}$ AC <sub>RMS</sub> /DC	<b>D10/CRCW0402 e3</b>	50 V	75 V
	<b>D11/CRCW0603 e3</b>	75 V	75 V
	<b>D12/CRCW0805 e3</b>	150 V	150 V
Resistance change		1 Ω to 10 MΩ	
Max. resistance change at $P_{70}/U_{\max.}$ AC <sub>RMS</sub> /DC for resistance change, $ ΔR/R $ after <sup>(1)</sup> :	1000 h	≤ 1 %	≤ 2 %
	8000 h	≤ 2 %	-

**Note**

<sup>(1)</sup> Applies to components with stability class 1

<b>TEMPERATURE COEFFICIENT AND RESISTANCE RANGE</b>				
<b>TYPE / SIZE</b>	<b>TCR</b>	<b>TOLERANCE</b>	<b>RESISTANCE</b>	<b>E-SERIES</b>
<b>D10/CRCW0402 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 1.5$ A	≤ 20 mΩ	0 Ω	-
<b>D11/CRCW0603 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 2.0$ A	≤ 20 mΩ	0 Ω	-
<b>D12/CRCW0805 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 2.5$ A	≤ 20 mΩ	0 Ω	-
<b>D25/CRCW1206 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 3.5$ A	≤ 20 mΩ	0 Ω	-
<b>CRCW1210 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 5.0$ A	≤ 20 mΩ	0 Ω	-
<b>CRCW1218 e3</b>	± 200	± 5	1 Ω to 2.2 MΩ	E24
	± 100	± 1	1 Ω to 2.2 MΩ	E24; E96
	Jumper, $I_{\max.} = 7.0$ A	≤ 20 mΩ	0 Ω	-
<b>CRCW2010 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 6.0$ A	≤ 20 mΩ	0 Ω	-
<b>CRCW2512 e3</b>	± 200	± 5	1 Ω to 10 MΩ	E24
	± 100	± 1	1 Ω to 10 MΩ	E24; E96
	Jumper, $I_{\max.} = 7.0$ A	≤ 20 mΩ	0 Ω	-

**Note**

- The temperature coefficient of resistance (TCR) is not specified for 0 Ω jumpers

<b>PACKAGING</b>						
Type / Size	Code	Quantity	Packaging Style	Width	Pitch	Packaging Dimensions
D10/CRCW0402 e3	ED = ET7 EE = EF4	10 000 50 000	Paper tape acc. to IEC 60286-3, Type 1a	2 mm	8 mm	Ø 180 mm / 7" Ø 330 mm / 13"
D11/CRCW0603 e3	EI = ET2 ED = ET3 EE = ET8	5000 10 000 50 000				Ø 180 mm / 7" Ø 180 mm / 7" Ø 330 mm / 13"
	EA = ET1 EC = ET6	5000 20 000				Ø 180 mm / 7" Ø 330 mm / 13"
D12/CRCW0805 e3	EA = ET1 EC = ET6	5000 20 000	Blister tape acc. to IEC 60286-3, Type 2a	4 mm	12 mm	Ø 180 mm / 7" Ø 330 mm / 13"
D25/CRCW1206 e3	EA = ET1 EC = ET6	5000 20 000				Ø 180 mm / 7" Ø 330 mm / 13"
CRCW1210 e3	EA = ET1 EC = ET6	5000 20 000				Ø 180 mm / 7" Ø 330 mm / 13"
CRCW1218 e3	EK = ET9	4000	Blister tape acc. to IEC 60286-3, Type 2a	4 mm	12 mm	Ø 180 mm / 7"
CRCW2010 e3	EF = E02	4000				Ø 180 mm / 7"
CRCW2512 e3	EG = E67 EH = E82	4000				Ø 180 mm / 7"

<b>PART NUMBER AND PRODUCT DESCRIPTION</b>										
Part Number: CRCW0603562RFKEA										
Part Number: CRCW06030000Z0EA										
C	R	C	W	0	6	0				
0	3	5	6	2	R	F				
K	E	A								
TYPE / SIZE		RESISTANCE		TOLERANCE		TCR		PACKAGING		
CRCW0402		R = decimal		F = ± 1 %		K = ± 100 ppm/K		EA, EC, ED, EE,		
CRCW0603		K = thousand		J = ± 5 %		N = ± 200 ppm/K		EF, EG, EH, EI, EK		
CRCW0805		M = million		Z = jumper		0 = jumper		(E.. = lead (Pb)-free)		
CRCW1206		0000 = jumper								
CRCW1210										
CRCW1218										
CRCW2010										
CRCW2512										
Product Description: D11/CRCW0603 100 562R 1 % ET1 e3										
Product Description: D11/CRCW0603 0R0 ET1 e3										
D11/CRCW0603	100	562R	1 %	ET1	e3					
TYPE / SIZE	TCR	RESISTANCE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE					
D10/CRCW0402	± 100 ppm/K	10R = 10 Ω	± 1 %	ET1, ET2, ET3,	e3 = pure tin					
D11/CRCW0603	± 200 ppm/K	562R = 562 Ω	± 5 %	ET6, ET7, ET8,	termination finish					
D12/CRCW0805		1M = 1 MΩ		ET9, EF4, E02,						
D25/CRCW1206		0R0 = jumper		E67, E82						
CRCW1210				(E.. = lead (Pb)-free)						
CRCW1218										
CRCW2010										
CRCW2512										

## DESCRIPTION

Production is strictly controlled and follows an extensive set of instructions established for reproducibility. A cermet film layer and a glass-over are deposited on a high grade ( $\text{Al}_2\text{O}_3$ ) ceramic substrate with its prepared inner contacts. A special laser is used to achieve the target value by smoothly fine trimming the resistive layer without damaging the ceramics. The resistor elements are covered by a protective coating designed for electrical, mechanical and climatic protection. The terminations receive a final pure matte tin on nickel plating.

The result of the determined production is verified by an extensive testing procedure on 100 % of the individual chip resistors. Only accepted products are laid directly into the tape in accordance with **IEC 60286-3 Type 1a and Type 2a** <sup>(1)</sup>.

## ASSEMBLY

The resistors are suitable for processing on automatic SMD assembly systems. They are suitable for automatic soldering using wave, reflow or vapor phase as shown in **IEC 61760-1** <sup>(1)</sup>. The encapsulation is resistant to all cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions. The suitability of conformal coatings, potting compounds and their processes, if applied, shall be qualified by appropriate means to ensure the long-term stability of the whole system.

The resistors are RoHS-compliant, the pure matte tin plating provides compatibility with lead (Pb)-free and lead-containing soldering processes. Solderability is specified for 2 years after production or requalification. The permitted storage time is 20 years. The immunity of the plating against tin whisker growth has been proven under extensive testing.

## MATERIALS

Vishay acknowledges the following systems for the regulation of hazardous substances:

- IEC 62474, Material Declaration for Products of and for the Electrotechnical Industry, with the list of declarable substances given therein <sup>(2)</sup>
- The Global Automotive Declarable Substance List (GADSL) <sup>(3)</sup>
- The REACH regulation (1907/2006/EC) and the related list of substances with very high concern (SVHC) <sup>(4)</sup> for its supply chain

The products do not contain any of the banned substances as per IEC 62474, GADSL, or the SVHC list, see [www.vishay.com/how/leadfree](http://www.vishay.com/how/leadfree).

Hence the products fully comply with the following directives:

- 2000/53/EC End-of-Life Vehicle Directive (ELV) and Annex II (ELV II)
- 2011/65/EU Restriction of the Use of Hazardous Substances Directive (RoHS) with amendment 2015/863/EU
- 2012/19/EU Waste Electrical and Electronic Equipment Directive (WEEE)

Vishay pursues the elimination of conflict minerals from its supply chain, see the Conflict Minerals Policy at [www.vishay.com/doc?49037](http://www.vishay.com/doc?49037).

## APPROVALS

The resistors are qualified according to AEC-Q200.

Where applicable, the resistors are tested in accordance with **EN 140401-802** which refers to **EN 60115-1**, **EN 60115-8** and the variety of environmental test procedures of the **IEC 60068** <sup>(1)</sup> series.

## RELATED PRODUCTS

For more information about products with better TCR and tighter tolerance please refer to the "Lead (Pb)-Free Thick Film, Rectangular, Semi-Precision Chip Resistors" datasheet ([www.vishay.com/doc?20036](http://www.vishay.com/doc?20036)).

The D/CRCW with SnPb termination plating is designed for applications where lead bearing terminations are mandatory. For ordering D/CRCW with SnPb terminations please refer to latest edition of datasheet D/CRCW ([www.vishay.com/doc?20008](http://www.vishay.com/doc?20008)).

## Notes

<sup>(1)</sup> The quoted IEC standards are also released as EN standards with the same number and identical contents

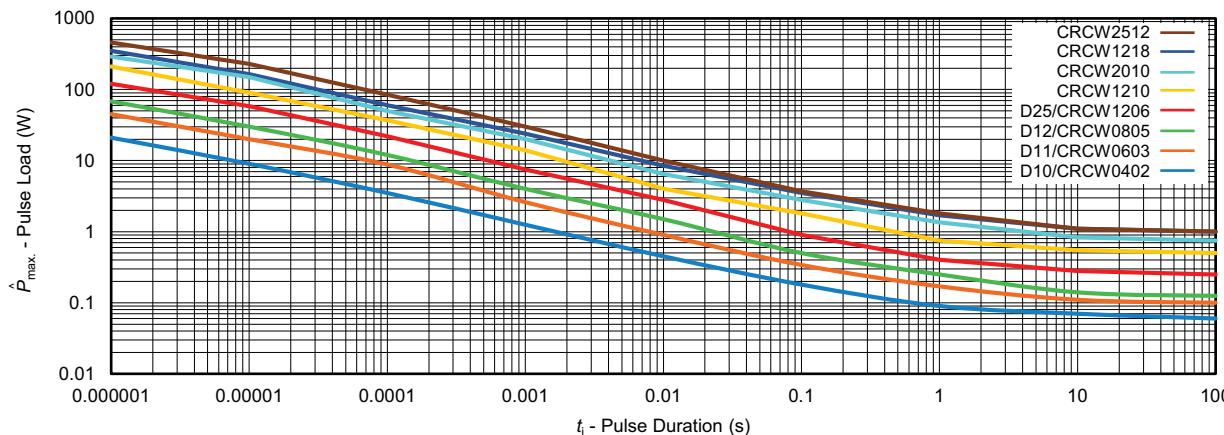
<sup>(2)</sup> The IEC 62474 list of declarable substances is maintained in a dedicated database, which is available at <http://std.iec.ch/iec62474>

<sup>(3)</sup> The Global Automotive Declarable Substance List (GADSL) is maintained by the American Chemistry Council and available at [www.gadsl.org](http://www.gadsl.org)

<sup>(4)</sup> The SVHC list is maintained by the European Chemical Agency (ECHA) and available at <http://echa.europa.eu/candidate-list-table>

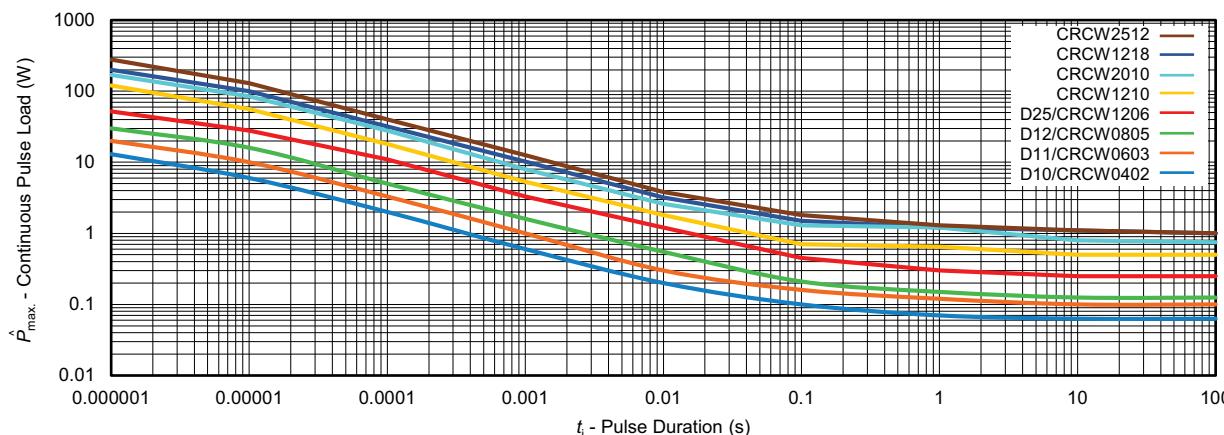
## FUNCTIONAL PERFORMANCE

### Single Pulse



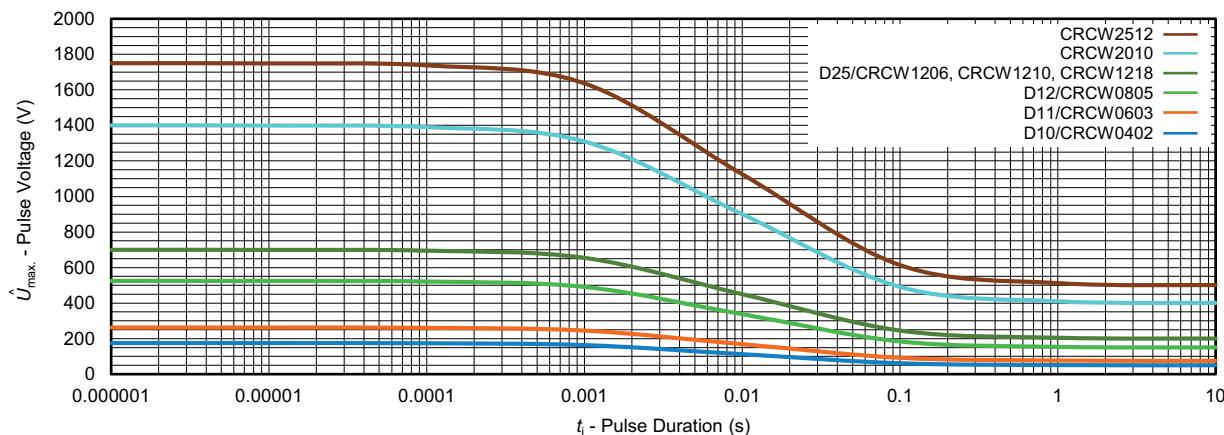
Maximum pulse load, single pulse; applicable if  $\bar{P} \rightarrow 0$  and  $n < 1000$  and  $\hat{U} = \hat{U}_{\max.}$ ; standard operation mode, for permissible resistance change equivalent to 8000 h operation

### Continuous Pulse



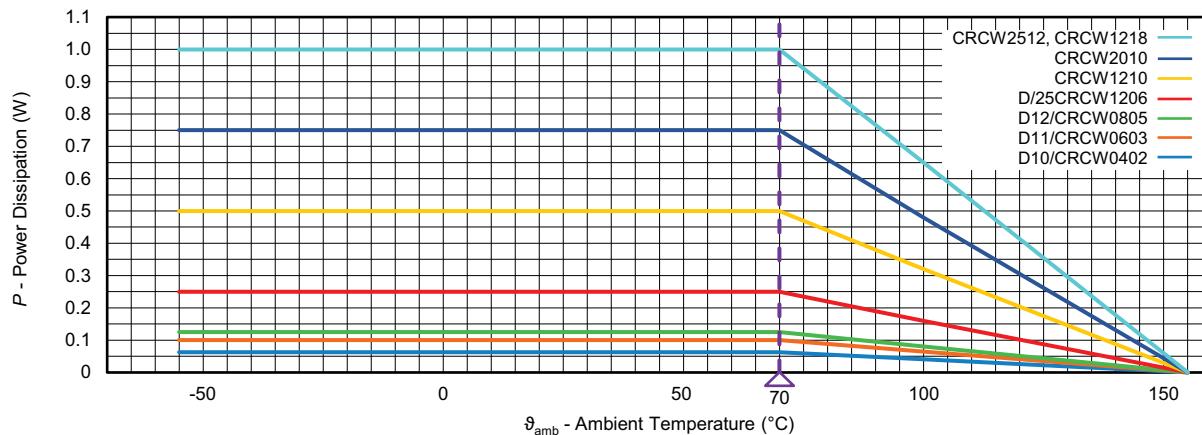
Maximum pulse load, continuous pulses; applicable if  $\bar{P} \leq P(v_{\text{amb}})$  and  $\hat{U} = \hat{U}_{\max.}$ ; standard operation mode, for permissible resistance change equivalent to 8000 h operation

### Pulse Voltage

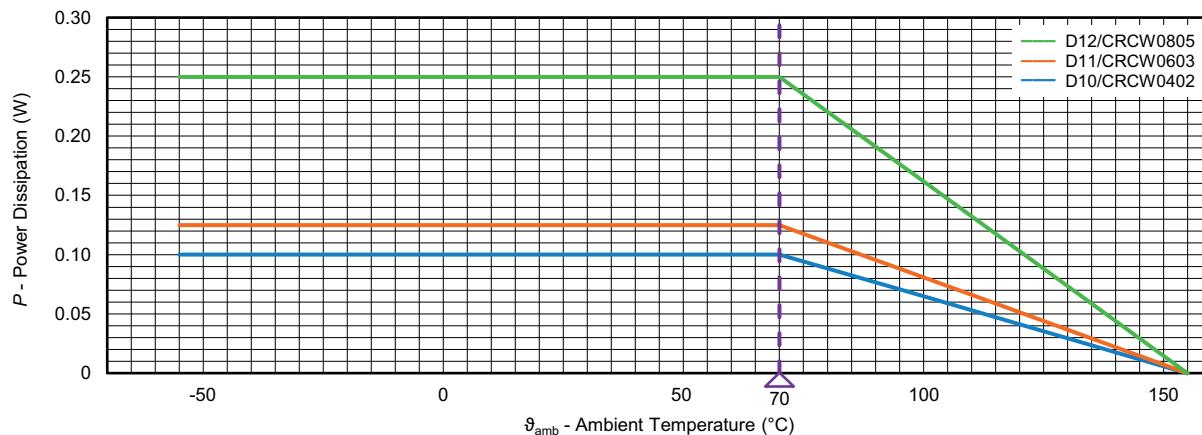


Maximum pulse voltage, single and continuous pulses; applicable if  $\hat{P} = \hat{P}_{\max.}$ ; standard operation mode, for permissible resistance change equivalent to 8000 h operation

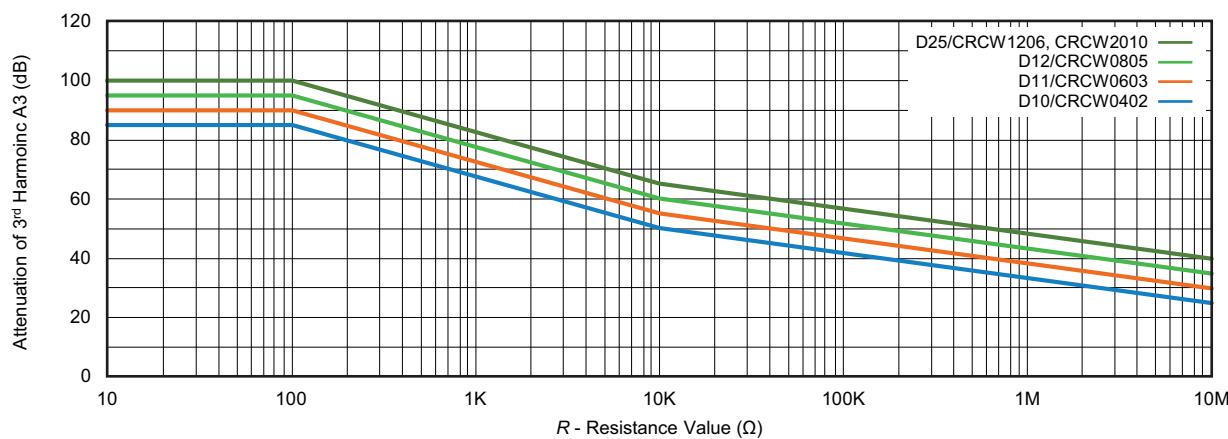
### Derating

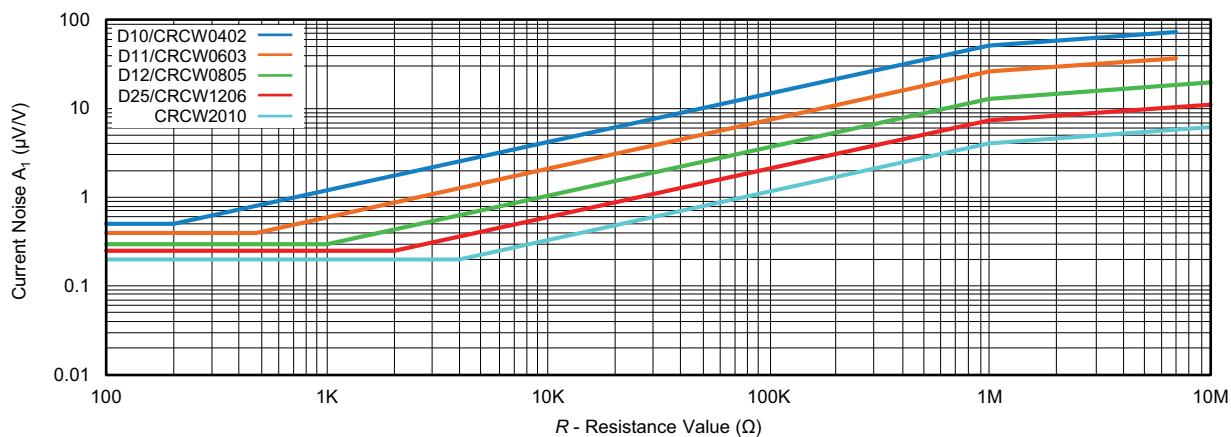


### Derating - Extended Operation



### Non-Linearity



**Current Noise**


## TESTS AND REQUIREMENTS

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

EN 60115-1, generic specification

EN 60115-8 (successor of EN 140400), sectional specification

EN 140401-802, detail specification

IEC 60068-2-xx, test methods

The parameters stated in the Test Procedures and Requirements table are based on the required tests and permitted limits of EN 140401-802. The table presents only the most important tests, for the full test schedule refer to the documents listed above. However, some additional tests and a number of improvements against those minimum requirements have been included.

The testing also covers most of the requirements specified by EIA/IS-703 and JIS-C-5201-1.

The tests are carried out under standard atmospheric conditions in accordance with IEC 60068-1, 4.3, whereupon the following values are applied:

Temperature: 15 °C to 35 °C

Relative humidity: 25 % to 75 %

Air pressure: 86 kPa to 106 kPa (860 mbar to 1060 mbar).

A climatic category LCT / UCT / 56 is applied, defined by the lower category temperature (LCT), the upper category temperature (UCT), and the duration of exposure in the damp heat, steady state test (56 days). The components are mounted for testing on boards in accordance with EN 60115-8, 2.4.2 unless otherwise specified.

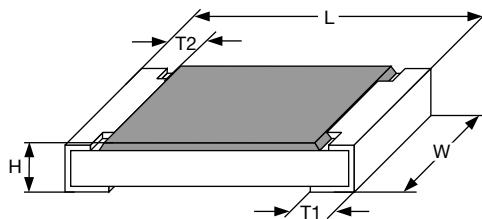
TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ ) <sup>(1)</sup>	
				STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER
			Stability for product types:	D10/CRCW0402 e3 to CRCW2512 e3	
			D/CRCW e3	1 Ω to 10 MΩ	
6.1	-	Measurements of resistance and tolerance	-	± 1 %	± 5 %
6.2	-	Temperature coefficient of resistance	At (20 / -55 / 20) °C and (20 / 155 / 20) °C	±100 ppm/K	± 200 ppm/K
7.1	-	Endurance at rated temperature 70 °C	$U = \sqrt{P_{70} \times R} \leq U_{\max.}$ ; whichever is the less severe; 1.5 h on; 0.5 h off  70 °C; 1000 h 70 °C; 8000 h	± (1 % $R + 0.05 \Omega$ )	± (2 % $R + 0.1 \Omega$ )
		Endurance at rated temperature 70 °C Extended operation mode	$U = \sqrt{P_{70} \times R} \leq U_{\max.}$ ; whichever is the less severe; 1.5 h on; 0.5 h off 70 °C; 1000 h	± (2 % $R + 0.1 \Omega$ )	± (4 % $R + 0.1 \Omega$ )
7.3	-	Endurance at maximum temperature	155 °C, 1000 h	± (1 % $R + 0.05 \Omega$ )	± (2 % $R + 0.1 \Omega$ )
10.4	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; (93 ± 3) % RH; 56 days	± (1 % $R + 0.05 \Omega$ )	
10.5	67 (Cy)	Damp heat, steady state, accelerated Extended or standard operation mode depend on case size	$(85 \pm 2) ^\circ C;$ $(85 \pm 5) \% RH;$ $U = \sqrt{0.1 \times P_{85} \times R} \leq 100 V;$ 1000 h	± (1 % $R + 0.05 \Omega$ )	± (2 % $R + 0.1 \Omega$ )

<b>TEST PROCEDURES AND REQUIREMENTS</b>					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ ) <sup>(1)</sup>	
				STABILITY CLASS 1 OR BETTER	STABILITY CLASS 2 OR BETTER
			Stability for product types:	D10/CRCW0402 e3 to CRCW2512 e3	
			<b>D/CRCW e3</b>	1 $\Omega$ to 10 M $\Omega$	
10.3	-	Climatic sequence:	-		
10.3.4.2	2 (Bb)	Dry heat	125 °C; 16 h		
10.3.4.3	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 1 cycle		
10.3.4.4	1 (Ab)	Cold	-55 °C; 2 h		
10.3.4.5	13 (M)	Low air pressure	8.5 kPa; 2 h; (25 ± 10) °C; 55 °C; > 90 % RH		
10.3.4.6	30 (Db)	Damp heat, cyclic	5 days; 5 cycles		
10.3.4.7	-	DC load Standard operation mode	$U = \sqrt{P_{70} \times R} \leq U_{\max.}$ 1 min		
-	1 (Ab)	Cold	-55 °C; 2 h	± (0.25 % $R$ + 0.05 $\Omega$ )	± (0.5 % $R$ + 0.05 $\Omega$ )
10.1	14 (Na)	Rapid change of temperature	30 min at -55 °C; and 30 min at 125 °C; 1000 cycles	± (1 % $R$ + 0.05 $\Omega$ ) no visible damage	
8.1	-	Short-term overload	$U = 2.5 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{\max.}$ ; whichever is the less severe; 5 s		± (2 % $R$ + 0.05 $\Omega$ )
8.2	-	Single pulse high voltage overload, 10 $\mu$ s/700 $\mu$ s	Severity no. 4: $U = 10 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{\max.}$ ; whichever is the less severe; 10 pulses 10 $\mu$ s/700 $\mu$ s		± (1 % $R$ + 0.05 $\Omega$ ) no visible damage
		Single pulse high voltage overload, 10 $\mu$ s/700 $\mu$ s Extended operation mode	Severity no. 4: $U = 10 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{\max.}$ ; whichever is the less severe; 10 pulses 10 $\mu$ s/700 $\mu$ s		± (2 % $R$ + 0.1 $\Omega$ ) no visible damage
8.4	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R}$ or $\leq 2 \times U_{\max.}$ ; whichever is the less severe; 0.1 s on; 2.5 s off; 1000 cycles		± (1 % $R$ + 0.05 $\Omega$ ) no visible damage
		Periodic electric overload Extended operation mode	$U = \sqrt{15 \times P_{70} \times R}$ or $\leq 2 \times U_{\max.}$ ; whichever is the less severe; 0.1 s on; 2.5 s off; 1000 cycles		± (2 % $R$ + 0.1 $\Omega$ ) no visible damage
8.5	-	Electrostatic discharge (human body model)	IEC 61340-3-1 <sup>(1)</sup> ; 3 pos. + 3 neg. discharges; ESD voltage acc. to the size: D10/CRCW0402 e3: 400 V D11/CRCW0603 e3: 800 V D12/CRCW0805 e3: 1000 V D25/CRCW1206 e3: 2000 V CRCW1210 e3 to CRCW2512 e3: ≥ 2000 V		± (1 % $R$ + 0.05 $\Omega$ )

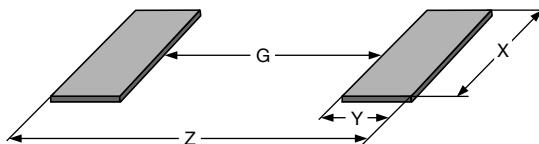
<b>TEST PROCEDURES AND REQUIREMENTS</b>						
<b>EN 60115-1 CLAUSE</b>	<b>IEC 60068-2 TEST METHOD</b>	<b>TEST</b>	<b>PROCEDURE</b>	<b>REQUIREMENTS PERMISSIBLE CHANGE (<math>\Delta R</math>) <sup>(1)</sup></b>		
				<b>STABILITY CLASS 1 OR BETTER</b>	<b>STABILITY CLASS 2 OR BETTER</b>	
			Stability for product types:	D10/CRCW0402 e3 to CRCW2512 e3		
			<b>D/CRCW e3</b>	1 $\Omega$ to 10 M $\Omega$		
9.11	6 (Fc)	Vibration	Endurance by sweeping; 10 Hz to 2000 Hz; no resonance; amplitude $\leq$ 1.5 mm or $\leq$ 200 m/s <sup>2</sup> ; 7.5 h	$\pm (0.25 \% R + 0.05 \Omega)$ no visible damage	$\pm (0.5 \% R + 0.05 \Omega)$ no visible damage	
11.1	58 (Td)	Solderability	Solder bath method; Sn60Pb40 non-activated flux; $(235 \pm 5)^\circ\text{C}$ $(2 \pm 0.2) \text{ s}$	Good tinning ( $\geq 95\%$ covered); no visible damage		
			Solder bath method; Sn96.5Ag3Cu0.5 non-activated flux; $(245 \pm 5)^\circ\text{C}$ $(3 \pm 0.3) \text{ s}$			
11.2	58 (Td)	Resistance to soldering heat	Solder bath method $(260 \pm 5)^\circ\text{C}$ ; $(10 \pm 1) \text{ s}$	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$	
11.3	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 °C; method 2	No visible damage		
9.7	21 (Ue <sub>3</sub> )	Shear (adhesion)	D10/CRCW0402 e3 and D11/CRCW0603 e3: 9 N D12/CRCW0805 e3 to CRCW2512 e3: 45 N	No visible damage		
9.8	21 (Ue <sub>1</sub> )	Substrate bending	Depth 2 mm; 3 times	$\pm (0.25 \% R + 0.05 \Omega)$ no visible damage, no open circuit in bent position		
12.2	-	Voltage proof	$U = 1.4 \times U_{\text{ins}}$ ; 60 s	No flashover or breakdown		
12.4	-	Flammability, needle flame test	IEC 60695-11-5 <sup>(1)</sup> ; 10 s	No burning after 30 s		

**Note**

<sup>(1)</sup> The quoted IEC standards are also released as EN standards with the same number and identical contents

**DIMENSIONS**


<b>DIMENSIONS AND MASS</b>						
<b>TYPE / SIZE</b>	<b>L (mm)</b>	<b>W (mm)</b>	<b>H (mm)</b>	<b>T1 (mm)</b>	<b>T2 (mm)</b>	<b>MASS (mg)</b>
<b>D10/CRCW0402 e3</b>	$1.0 \pm 0.05$	$0.5 \pm 0.05$	$0.35 \pm 0.05$	$0.25 \pm 0.10$	$0.2 \pm 0.10$	0.65
<b>D11/CRCW0603 e3</b>	$1.55 + 0.10 / - 0.05$	$0.85 \pm 0.10$	$0.45 \pm 0.05$	$0.3 \pm 0.20$	$0.3 \pm 0.20$	2
<b>D12/CRCW0805 e3</b>	$2.0 + 0.20 / - 0.10$	$1.25 \pm 0.15$	$0.5 \pm 0.10$	$0.3 + 0.20 / - 0.10$	$0.3 \pm 0.20$	5.5
<b>D25/CRCW1206 e3</b>	$3.2 + 0.10 / - 0.20$	$1.6 \pm 0.15$	$0.55 \pm 0.05$	$0.45 \pm 0.20$	$0.4 \pm 0.20$	10
<b>CRCW1210 e3</b>	$3.2 \pm 0.20$	$2.5 \pm 0.20$	$0.55 \pm 0.05$	$0.45 \pm 0.20$	$0.4 \pm 0.20$	16
<b>CRCW1218 e3</b>	$3.2 + 0.10 / - 0.20$	$4.6 \pm 0.15$	$0.55 \pm 0.05$	$0.45 \pm 0.20$	$0.4 \pm 0.20$	29.5
<b>CRCW2010 e3</b>	$5.0 \pm 0.15$	$2.5 \pm 0.15$	$0.6 \pm 0.10$	$0.6 \pm 0.20$	$0.6 \pm 0.20$	25.5
<b>CRCW2512 e3</b>	$6.3 \pm 0.20$	$3.15 \pm 0.15$	$0.6 \pm 0.10$	$0.6 \pm 0.20$	$0.6 \pm 0.20$	40.5

**SOLDER PAD DIMENSIONS**


<b>TYPE / SIZE</b>	<b>WAVE SOLDERING</b>				<b>REFLOW SOLDERING</b>			
	<b>G (mm)</b>	<b>Y (mm)</b>	<b>X (mm)</b>	<b>Z (mm)</b>	<b>G (mm)</b>	<b>Y (mm)</b>	<b>X (mm)</b>	<b>Z (mm)</b>
<b>D10/CRCW0402 e3</b>	-	-	-	-	0.45	0.6	0.6	1.65
<b>D11/CRCW0603 e3</b>	0.65	1.10	1.25	2.85	0.75	0.75	1.00	2.25
<b>D12/CRCW0805 e3</b>	0.90	1.30	1.60	3.50	1.00	0.95	1.45	2.90
<b>D25/CRCW1206 e3</b>	1.40	1.40	1.95	4.20	1.50	1.05	1.80	3.60
<b>CRCW1210 e3</b>	1.80	1.45	2.95	4.70	1.70	1.10	2.80	3.90
<b>CRCW1218 e3</b>	1.80	1.30	5.10	4.40	1.90	1.10	4.90	4.10
<b>CRCW2010 e3</b>	3.40	1.65	2.85	6.70	3.50	1.45	2.80	6.40
<b>CRCW2512 e3</b>	4.60	1.60	3.65	7.80	4.75	1.45	3.50	7.65

**Notes**

- The given solder pad dimensions reflect the considerations for board design and assembly as outlined e.g. in standards IEC 61188-5-x<sup>(1)</sup> or in publication IPC-7351.

Still, the given solder pad dimensions will be found adequate for most general applications

<sup>(1)</sup> The quoted IEC standards are also released as EN standards with the same number and identical contents



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