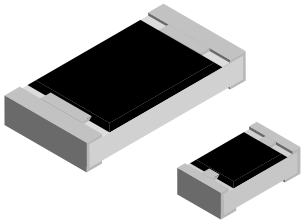
D../CRCW....-LR

Vishay

Lead (Pb)-bearing Thick Film, Rectangular Low Value Chip Resistor



The RCWL is a direct replacement to the D../CRCW….-LR type resistor with no change in performance or quality. For RCWL datasheet please visit our website at www.vishay.com/doc?20018

FEATURES

- Low resistance values (down to 0.1 Ω)
- Suitable for current sensors and shunts
- SnPb contacts on Ni barrier layer
- Metal glaze on high quality ceramic
- Protective overglaze

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE MAX. V≅	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
	INCH	METRIC						
D10/CRCW0402-LR	0402	1005	0.063	$\sqrt{P \times R}$	± 600 ± 400	± 5	0.22 to 0.43 0.47 to 0.91	24
D11/CRCW0603-LR	0603	1608	0.10	$\sqrt{P \times R}$	± 400 ± 200	± 5	0.10 to 0.43 0.47 to 0.91	24
D12/CRCW0805-LR	0805	2012	0.125	$\sqrt{P \times R}$	± 300 ± 200	± 5	0.10 to 0.43 0.47 to 0.91	24
D25/CRCW1206-LR	1206	3216	0.25	$\sqrt{P \times R}$	± 300 ± 200	± 5	0.10 to 0.43 0.47 to 0.91	24
CRCW1210-LR	1210	3225	0.33	$\sqrt{P \times R}$	± 200	± 5	0.10 to 0.91	24
CRCW1218-LR	1218	3246	1.0	$\sqrt{P \times R}$	± 200	± 5	0.10 to 0.91	24
CRCW2010-LR	2010	5025	0.50	$\sqrt{P \times R}$	± 200	± 5	0.10 to 0.91	24
CRCW2512-LR	2512	6332	1.0	$\sqrt{P \times R}$	± 200	± 5	0.10 to 0.91	24

Notes
- 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.
- Marking and packaging: See appropriate catalog or web page
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- The resistance is measured from the top side

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	D10/ CRCW0402-LR	D11/ CRCW0603-LR	D12/ CRCW0805-LR	D25/ CRCW1206-LR	CRCW1210-LR	CRCW1218-LR	CRCW2010-LR	CRCW2512-LR
Rated Dissipation at 70 °C (2)	W	0.063	0.1	0.125	0.25	0.33	1.0	0.5	1.0
Rated Voltage	V≅	$\sqrt{P \times R}$							
Insulation Voltage (1 min)	V_{peak}	> 75	> 100	> 200	> 300	> 300	> 300	> 300	> 300
Thermal Resistance (1)	K/W	≤ 870	≤ 550	≤ 440	≤ 220	≤ 140	≤ 65	≤ 88	≤ 65
Insulation Resistance	Ω	$> 10^9$							
Category Temp. Range	°C	- 55 to + 155							
Failure Rate	h^{-1}	0.3×10^{-9}							
Weight/ 1000 pieces	g	0.65	2	5.5	10	16	29.5	25.5	40.5

Notes
(1) For sizes 0402 until 1206 the measuring conditions are in acc. to EN 140401-802. For all other sizes the result depends on the solder pad dimensions.
(2) 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 °C is not exceeded.

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: CRCW0805R470JNTALR (1)

C	R	C	W	0	8	0	5	R	4	7	0	J	N	T	A	L	R

MODEL/SIZE	VALUE	TOLERANCE	TCR	PACKAGING (2)	SPECIAL
CRCW0402 **CRCW0603** **CRCW0805** **CRCW1206** **CRCW1210** **CRCW1218** **CRCW2010** **CRCW2512**	**R** = Decimal	**J** = ± 5 %	**N** = ± 200 ppm/K **M** = ± 300 ppm/K **Q** = ± 400 ppm/K **T** = ± 600 ppm/K	**TA, TB,** **TC, TD,** **TE, TF,** **TG, TH,** **TI, TK,** **TL**	Up to 2 digits **LR** = Low Value

PRODUCT DESCRIPTION: CRCW0402 R47 J 200 RT1

CRCW0402	R47	J	200	RT1
MODEL	RESISTANCE VALUE	TOLERANCE	TCR	PACKAGING (2)
CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW1210 CRCW1218 CRCW2010 CRCW2512	R10 = 0.1 Ω	J = ± 5 %	± 200 ppm/K ± 300 ppm/K ± 400 ppm/K ± 600 ppm/K	RT1, RT5, RT6, RT7, RF4, R02, R67, R82, RG1, RT9, R20

Notes

(1) Preferred way for ordering products is by use of the PART NUMBER

(2) Please refer to table PACKAGING, see below

PACKAGING

MODEL	REEL							
	TAPE WIDTH	DIAMETER	PITCH	PIECES/ REEL	PACKAGING CODE			
					PART NUMBER		PRODUCT DESC.	
					PAPER	BLISTER	PAPER	BLISTER
D10/ CRCW0402-LR	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	2 mm 2 mm 2 mm	10 000 20 000 50 000	TD TC TE		RT7 RT6 RT4	
D11/ CRCW0603-LR	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	TA TB TC	TI TL	RT1 RT5 RT6	RG1 R20
D12/ CRCW0805-LR	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	TA TB TC	TI TL	RT1 RT5 RT6	RG1 R20
D25/ CRCW1206-LR	8 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	TA TB TC	TI TL	RT1 RT5 RT6	RG1 R20
CRCW1210-LR	12 mm	180 mm/7" 285 mm/11.25" 330 mm/13"	4 mm 4 mm 4 mm	5000 10 000 20 000	TA TB TC		RT1 RT5 RT6	
CRCW1218-LR	12 mm	180 mm/7"	4 mm	4000		TK		RT9
CRCW2010-LR	12 mm	180 mm/7"	4 mm	4000		TF		R02
CRCW2512-LR	12 mm	180 mm/7"	8 mm 4 mm	2000 4000		TG TH		R67 R82

D../CRCW....-LR

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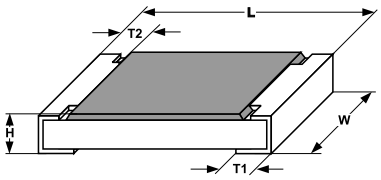
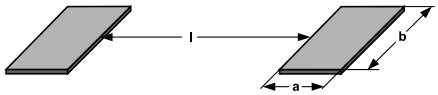
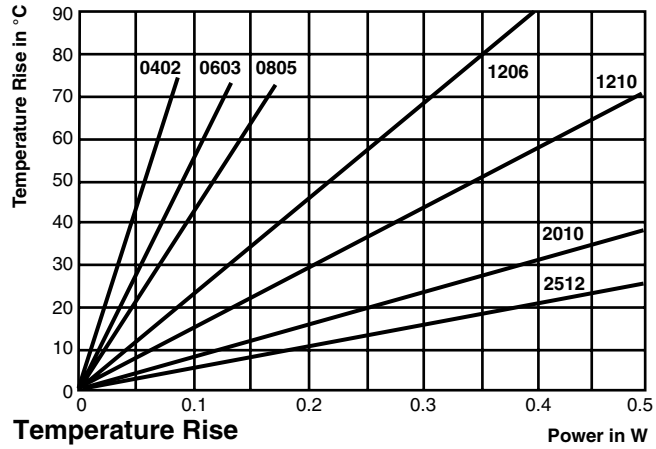
Low Value Chip Resistor

DIMENSIONS

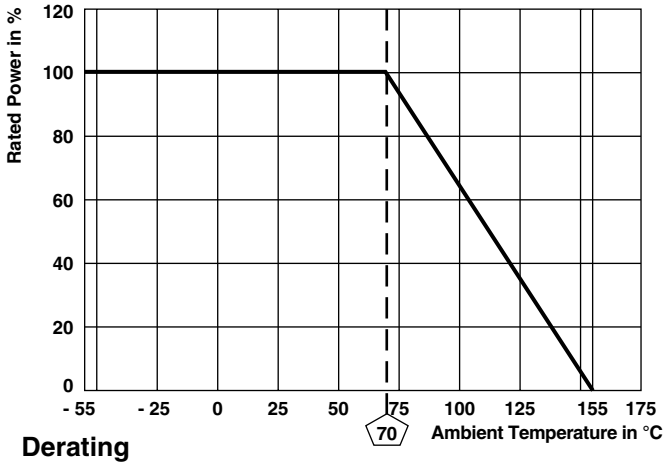




SIZE		DIMENSIONS [in millimeters]					SOLDER PAD DIMENSIONS [in millimeters]					
							REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC	L	W	H	T1	T2	a	b	l	a	b	l
0402	1005	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 $^{+0.05}_{-0.10}$	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1.55 $^{+0.10}_{-0.05}$	0.85 ± 0.1	0.45 ± 0.05	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	2.0 $^{+0.20}_{-0.10}$	1.25 ± 0.15	0.45 ± 0.05	0.3 $^{+0.20}_{-0.10}$	0.3 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	3.2 $^{+0.10}_{-0.20}$	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
1210	3225	3.2 ± 0.2	2.5 ± 0.2	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	2.5	2.0	1.1	2.5	2.2
1218	3246	3.2 $^{+0.10}_{-0.20}$	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	1.05	4.9	1.9	1.25	4.8	1.9
2010	5025	5.0 ± 0.15	2.5 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	2.5	3.9	1.2	2.5	3.9
2512	6332	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	3.2	5.2	1.2	3.2	5.2



Temperature Rise



Derating

For technical questions, contact: filmresistors.thickfilmchip@vishay.com

TEST PROCEDURES AND REQUIREMENTS

EN 60115-1		
TEST (clause)	**CONDITIONS OF TEST**	**REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$) (1)**
		STABILITY CLASS 2 OR BETTER
	Stability for product types:	
	D../CRCW....-LR	0.1 Ω to 0.91 Ω
Resistance (4.5)	-	± 5 %
Temperature coefficient (4.8.4.2)	20/- 55/20 °C and 20/125/20 °C	± 200 ppm/K, ± 300 ppm/K, ± 400 ppm/K, ± 600 ppm/K
Overload (4.13)	$U = 2.5 \times (P_{70} \times R)^{1/2}$ ≤ 2 x $U_{max.}$; Duration: according the style	± (0.5 % R + 0.005 Ω)
Solderability (4.17.5)	Aging 4 h at 155 °C, dryheat solder bath method; 235 °C; 2 s visual examination	Good tinning (≥ 95 % covered) no visible damage
Resistance to soldering heat (4.18.2)	Solder bath method; (260 ± 5) °C; (10 ± 1) s	± (0.5 % R + 0.005 Ω)
Rapid change of temperature (4.19)	30 min at LCT = - 55 °C; 30 min at UCT = 125 °C; 5 cycles	± (0.5 % R + 0.005 Ω)
Damp heat, steady state (4.24)	(40 ± 2) °C; 56 days; (93 ± 3) % RH	± (2 % R + 0.01 Ω)
Climatic sequence (4.23)	16 h at UCT = 125 °C; 1 cycle at 55 °C; 2 h at LCT = - 55 °C; 1 h/1 kPa at 15 °C to 35 °C; 5 cycles at 55 °C $U = (P_{70} \times R)^{1/2}$ $U = U_{max.}$; whichever is less severe	± (2 % R + 0.01 Ω)
Endurance at 70 °C (4.25.1)	$U = (P_{70} \times R)^{1/2}$ $U = U_{max.}$; whichever is less severe 1.5 h ON; 0.5 h OFF; 70 °C; 1000 h	± (2 % R + 0.01 Ω)
Extended endurance (4.25.1.8)	Duration extended to 8000 h	± (4 % R + 0.01 Ω)
Endurance at upper category temperature (4.25.3)	UCT = 125 °C; 1000 h	± (2 % R + 0.01 Ω)

Note

(1) Values valid for measurements from the top side

APPLICABLE SPECIFICATIONS

- EN 60115-1 Generic Specification
- EN 140400 Sectional Specification
- EN 140401-802 Detail Specification
- IEC 60068-2-X Variety of environmental test procedures
- IEC 60286-3 Packaging of SMD components

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