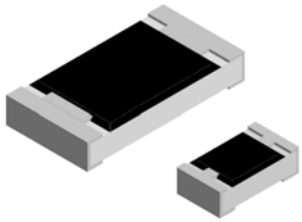
Thick Film Surface Mount Chip Resistors, Wraparound, Extremely Low Value (0.01 Ω to 0.976 Ω)



FEATURES

- Extremely low resistance values (0.01 Ω to 0.976 Ω)
- Enhanced power rating due to long side terminal construction (0612, 1020 types)
- Suitable for current sensing and shunts
- Metal glaze on high quality ceramic
- Protective overglaze
- Lead (Pb)-free solder contacts on Ni barrier layer
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb e3 RoHS COMPLIANT HALOGEN FREE

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\,°C}$ W	TEMPERATURE COEFFICIENT ± ppm/°C	RESISTANCE RANGE Ω	TOLERANCE ± %	E-SERIES (2)
RCWE0402	0402	0.125	400	0.033 to 0.05	5.0	24
			200	0.051 to 0.18	1.0, 5.0	24; 96
			100	0.2 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE0603	0603	0.2	700	0.010 to 0.018	5.0	24
			400	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.105	1.0, 5.0	
			100	0.11 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE0805	0805	0.25	400	0.010 to 0.018	5.0	24
			300	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE0612	0612	1.0	300	0.010 to 0.016	2.0, 5.0	24
			200	0.018 to 0.2	2.0, 5.0	
			100	0.205 to 0.976	1.0, 5.0	24; 96
RCWE1206	1206	0.5	600	0.010 to 0.018	5.0	24
			300	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE1210	1210	1.0	500	0.010 to 0.018	5.0	24
			300	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE1020	1020	2.0	200	0.010 to 0.016	2.0, 5.0	24
			100	0.0162 to 0.976	1.0, 5.0	24; 96
RCWE2010	2010	1.0	600	0.010 to 0.018	5.0	24
			300	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5, 1.0, 5.0 (1)	
RCWE2512	2512	2.0	600	0.010 to 0.018	5.0	24
			300	0.02 to 0.03	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5, 1.0, 5.0 (1)	

Notes

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.
- Part marking: Reference “Surface Mount Resistor Marking” (www.vishay.com/doc?20020).

(1) Tight tolerance of 0.5 % is available for resistance values above 0.200 Ω.

(2) Use E24 decade values for 5.0 % tolerance parts and E96 decade values for 0.5 % and 1.0 %. Refer to Standard Decade Table (www.vishay.com/doc?31001).

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: RCWE060351L0FNEA (visit www.vishay.net Vishay Dale parts numbering manual for all options)

R	C	W	E	0	6	0	3	5	1	L	0	F	N	E	A

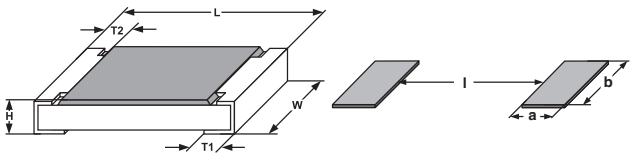
GLOBAL MODEL (8 digits)	VALUE (4 digits)	TOLERANCE (1 digit)	TCR (1 digit)	PACKAGING (2 digits)
RCWE0402 **RCWE0603** **RCWE0805** **RCWE0612** **RCWE1206** **RCWE1210** **RCWE1020** **RCWE2010** **RCWE2512**	**L** = mΩ * **R** = decimal **10L0** = 0.01 Ω **R470** = 0.47 Ω **Note**: * Use "**L**" for resistance values < 0.1 Ω	**D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 %	**K** = ± 100 ppm/°C **N** = ± 200 ppm/°C **M** = ± 300 ppm/°C **Q** = ± 400 ppm/°C **P** = ± 500 ppm/°C **T** = ± 600 ppm/°C **G** = ± 700 ppm/°C	**EA** = lead (Pb)-free, tape/reel

TECHNICAL SPECIFICATIONS

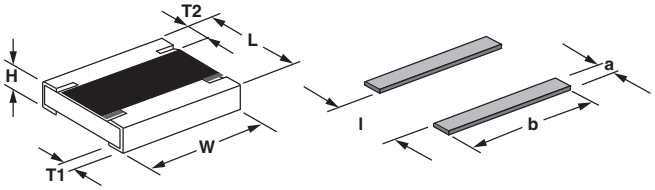
PARAMETER	UNIT	RCWE0402	RCWE0603	RCWE0805	RCWE0612	RCWE1206	RCWE1210	RCWE1020	RCWE2010	RCWE2512
Operating temp. range	°C	-55 to +155								
Maximum operating voltage	V	$(P \times R)^{1/2}$								
Insulation voltage U_{ins} (1 min)	V	> 75	> 100	> 200	> 100	> 300	> 300	> 300	> 300	> 300
Insulation resistance	Ω	> 10^9								
Weight/1000 pieces (typical)	g	0.7	3	5.5	11.5	10.5	17.5	27.5	26	40.5

DIMENSIONS

RCWE0402 to RCWE2512

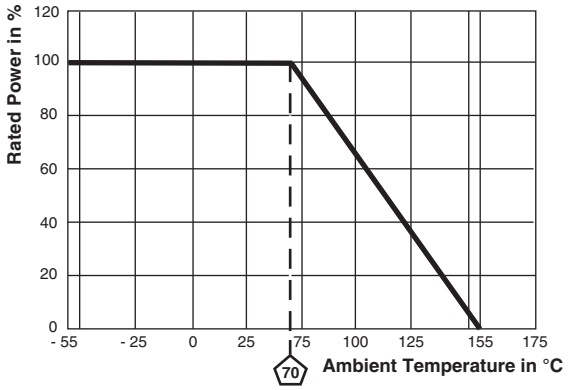


RCWE0612, RCWE1020



MODEL	RESISTANCE RANGE Ω	DIMENSIONS in millimeters L	W	H	T1	T2	SOLDER PAD DIMENSIONS in millimeters a	b	l
RCWE0402	0.033 to 0.976	1.05 ± 0.05	0.55 ± 0.05	0.35 ± 0.1	0.3 ± 0.15	0.25 ± 0.1	0.7	0.7	0.3
RCWE0603	0.01 to 0.03	1.6 ± 0.1	0.85 ± 0.1	0.5 ± 0.1	0.5 ± 0.2	0.3 ± 0.2	0.9	1.0	0.4
	0.033 to 0.976				0.3 ± 0.2		0.7	1.0	0.8
RCWE0805	0.01 to 0.03	2.0 ± 0.15	1.3 ± 0.1	0.55 ± 0.1	0.6 ± 0.2	0.35 ± 0.2	1.0	1.4	0.6
	0.033 to 0.976				0.4 ± 0.2		0.8	1.4	1.0
RCWE0612	0.01 to 0.976	1.6 ± 0.2	3.2 ± 0.2	0.6 ± 0.1	0.4 ± 0.15	0.25 ± 0.15	0.9	3.5	0.8
RCWE1206	0.01 to 0.03	3.1 ± 0.15	1.6 ± 0.15	0.6 ± 0.1	0.9 ± 0.2	0.45 ± 0.2	1.3	1.8	1.0
	0.033 to 0.05				0.8 ± 0.2		1.2	1.8	1.2
	0.051 to 0.976				0.45 ± 0.2		1.0	1.8	1.6
RCWE1210	0.01 to 0.03	3.1 ± 0.2	2.5 ± 0.2	0.6 ± 0.1	0.8 ± 0.2	0.4 ± 0.2	1.3	2.6	1.1
	0.033 to 0.976				0.4 ± 0.2		0.9	2.6	2.0
RCWE1020	0.01 to 0.976	2.5 ± 0.2	5.0 ± 0.2	0.6 ± 0.1	0.55 ± 0.15	0.30 ± 0.15	1.2	5.5	1.4
RCWE2010	0.01 to 0.03	5.0 ± 0.2	2.5 ± 0.15	0.6 ± 0.1	1.6 ± 0.3	0.6 ± 0.2	2.3	3.0	1.4
	0.033 to 0.05				0.7 ± 0.3		1.4	3.0	3.2
	0.051 to 0.976				0.7 ± 0.3		1.4	3.0	3.2
RCWE2512	0.01 to 0.03	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.1	2.0 ± 0.3	0.6 ± 0.2	2.8	3.6	1.4
	0.033 to 0.05				0.8 ± 0.3		1.6	3.6	3.8
	0.051 to 0.976				0.8 ± 0.3		1.6	3.6	3.8

DERATING



PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**TEST LIMITS**
Thermal shock	MIL-STD-202, method 107, -55 °C to +125 °C, 300 cycles at each extreme	± (1.0 % + 0.0005 Ω) Δ*R*
Short time overload	2 x rated power; duration according the model	± (0.5 % + 0.0005 Ω) Δ*R*
High temperature exposure	MIL-STD-202, method 108, 1000 h at T = 125 °C, 0 % power	± (2.0 % + 0.0005 Ω) Δ*R*
Temperature cycling	JESD 22, method JA-104, 1000 cycles (-55 °C to +125 °C)	± (2.0 % + 0.0005 Ω) Δ*R*
Biased humidity	MIL-STD-202, method 103, 1000 h 85 °C/85 % RH, 10 % x $(P \times R)^{1/2}$	± (2.0 % + 0.0005 Ω) Δ*R*
Mechanical shock	MIL-STD-202, method 213, condition C, 10 *g*'s, 6 ms (half sine), 3 directions	± (1.0 % + 0.0005 Ω) Δ*R*
Vibration	MIL-STD-202, method 204, 5 *g*'s, 20 min, 12 cycles, 3 directions, 10 Hz to 2000 Hz	± (1.0 % + 0.0005 Ω) Δ*R*
Operational life	MIL-STD-202, method 108, 1000 h at T = 125 °C at rated power	± (2.0 % + 0.0005 Ω) Δ*R*
Resistance to solder heat	MIL-STD-202, method 210, +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± (1.0 % + 0.0005 Ω) Δ*R*
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± (2.0 % + 0.0005 Ω) Δ*R*

PACKAGING					
MODEL	**REEL**				
	TAPE WIDTH	**DIAMETER**	**PITCH**	**PIECES/REEL**	**CODE**
RCWE0402	8 mm/punched paper	180 mm/7"	2 mm	10 000	EA
RCWE0603	8 mm/punched paper	180 mm/7"	4 mm	5000	EA
RCWE0805	8 mm/punched paper	180 mm/7"	4 mm	5000	EA
RCWE0612	8 mm/punched paper	180 mm/7"	4 mm	5000	EA
RCWE1206	8 mm/punched paper	180 mm/7"	4 mm	5000	EA
RCWE1210	8 mm/punched paper	180 mm/7"	4 mm	5000	EA
RCWE1020	12 mm/embossed plastic	180 mm/7"	4 mm	4000	EA
RCWE2010	12 mm/embossed plastic	180 mm/7"	4 mm	4000	EA
RCWE2512	12 mm/embossed plastic	180 mm/7"	8 mm	2000	EA

Note

- Embossed carrier tape per EIA-481-1A.

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